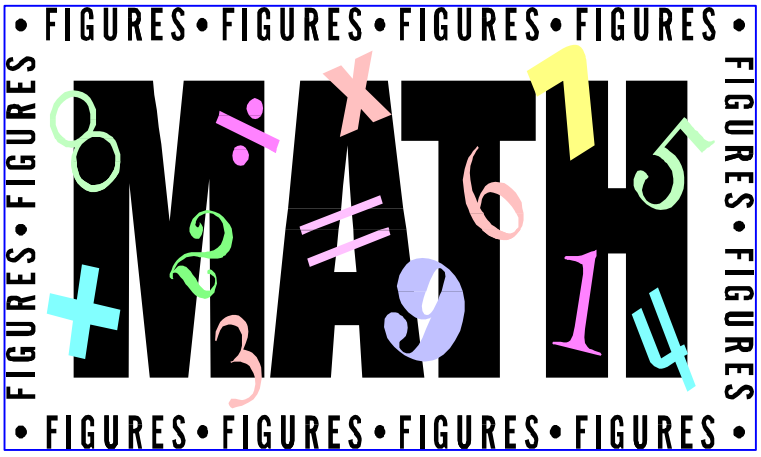
Florida's Instructional Materials Specifications for the 2003-2004 Adoption

Grades 9-12



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Florida Perspective

The Florida Vision

The mathematics vision statement set forth in the *Florida Curriculum Framework: Mathematics*, 1996, a support document for the implementation of school improvement in Florida, describes many aspects of a successful mathematics program. That statement (page 11) reads as follows:

> In mathematics teaching and learning
>
> - students are excited by, are interested in, and value their mathematical activities;
> - students work together and individually to find solutions to real problems;
> - technology and other tools are used as an integral part of the teaching and learning process;
> - learning is conceptually based, meaningful, and connected within mathematics and with other disciplines, using real-world phenomena;
> - the community has high but achievable expectations for all students;
> - assessment is an integral part of the teaching and learning process;
> - opportunities for both written and oral communication, as well as reflective thinking, are regularly integrated into the mathematics learning activities; and teaching strategies and learning environments promote mathematics equity for all students.

Among the assumptions underlying the vision are these :

- Cultural diversity enriches the learning environment.
- Instructional programs and teaching strategies should accommodate diverse learning styles and needs.
- Excellence in mathematics teaching and learning grows from a commitment shared by teachers, students, parents, administrators, and the community at large.

This vision from the 1996 *Florida Curriculum Framework* is very similar to the vision that appears in the *Principles and Standards for School Mathematics*, published in 2000 by the National Council for Teachers of Mathematics. That vision is more explicit regarding problem solving, stating (page 3) that students

> …draw on knowledge from a wide variety of mathematical topics, sometimes approaching the same problem from different mathematical perspectives or representing the mathematics in different ways until they find methods that enable them to make progress. Teachers help students make, refine, and explore conjectures on the basis of evidence and use a variety of reasoning and proof techniques to confirm or disprove those conjectures.

The Florida *Sunshine State Standards* (1996) are statements that define what Florida students are expected to know and be able to do as they complete various grade clusters, K-2, 3-5, 6-8, and 9-12. They address five content strands; Number Sense, Concepts, and Operations; Measurement; Geometry and Spatial Sense; Algebraic Thinking; and Data Analysis and Probability. Problem solving, technology use, and student communication are embedded across the strands. These *Standards* were developed by Florida mathematics educators with due attention to standards developed by other states and to the NCTM *Standards* published in 1989. By statute, instruction in Florida's public schools must include the *Sunshine State Standards*.

The *Sunshine State Standards* were developed to help meet the Goal 3 Standards. Goal 3 is one of seven major goals for the school improvement and accountability system in Florida, deals with student performance. Goal 3 states:

> Students successfully compete at the highest levels nationally and internationally and are prepared to make well-reasoned, thoughtful and healthy lifelong decisions (*Florida Curriculum Framework Mathematics*, page 13).

The Goal 3 Standards state that schools are accountable for preparing all students to be: information managers, effective communicators, numeric problem solvers, creative and critical thinkers, responsible workers, resource managers, systems managers, cooperative workers, effective leaders, and multiculturally sensitive citizens. The *Florida Comprehensive Assessment Test* (FCAT) is one measure of progress toward the *Sunshine*

State Standards and toward achieving the first four Goal 3 Standards for students. Complete statements of the first four Standards follow:

> Standard 1: Florida students locate, comprehend, interpret, evaluate, maintain, and apply information, concepts, and ideas found in literature, the arts, symbols, recordings, video and other graphic displays, and computer files in order to perform tasks and/or for enjoyment.
>
> Standard 2: Florida students communicate in English and other languages using information, concepts, prose, symbols, reports, audio and video recordings, speeches, graphic displays, and computer-based programs.
>
> Standard 3: Florida students use numeric operations and concepts to describe, analyze, disaggregate, communicate, and synthesize numeric data, and to identify and solve problems.
>
> Standard 4: Florida students use creative thinking skills to generate new ideas, make the best decision, recognize and solve problems through reasoning, interpret symbolic data, and develop efficient techniques for lifelong learning (pages 16 – 18, *Florida Curriculum Framework Mathematics*).

In addition to the goals defined thus far, Florida has specific course descriptions for all secondary courses (grades 6-12). The basic assumptions for mathematics education in Florida, as they appear in all secondary course descriptions that have been aligned with the *Sunshine State Standards* are:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the *Sunshine State Standards* are developed across the PreK-12 curriculum.

Taken together, these vision and Goal 3 statements establish demanding goals for the mathematics classroom.

Florida's Teaching and Learning Challenges

Teachers and students of mathematics in the state of Florida face many challenges in this first decade of the twenty-first century.

Need for Qualified Teachers

There is an extreme shortage of qualified mathematics teachers. Many of the 6-12 teachers in mathematics classrooms are teaching out-of-field. Many certified teachers at all levels need professional development in current mathematics content and pedagogy. Many teachers need to witness and learn new approaches to teaching, to assure that they will be able to:

- use concrete materials, calculators, computers, and the Internet;
- build mathematical concepts by using the concrete to pictorial to abstract sequence and effectively linking the three stages;
- encourage a more active role for students through team and group activities;
- build true classroom communication regarding mathematics;
- diagnose and correct students' errors and misconceptions;
- help students to read mathematics text;
- use alternative assessment strategies and help the students to learn self-assessment skills; and
- master ways to accommodate the needs of a diverse population where all students are expected to reach their highest potential.

High Expectations

Teachers and students are engaged in meeting the challenges of high expectations. Successful completion of Algebra I (or its equivalent) is now required for high school graduation. Legislation encouraging higher level courses has resulted in a reduction of course offerings and membership for 9-12 courses that precede Algebra I, such as Pre-Algebra, Consumer Mathematics, and Explorations I.

Scores on the *Florida Comprehensive Assessment Test* (FCAT), which includes mathematics, reading, and writing, are a major factor in the grading of schools, part of the current accountability system in Florida. A passing score on the 10^{th} grade FCAT is also required for high school graduation. The FCAT mathematics test places a major emphasis on problem solving. A good middle school background plus high school algebra coursework is generally sufficient preparation for the content addressed in the tenth grade FCAT. Students must be able to perform computation, but computation is usually embedded in problem-solving contexts. Many of the multiple-choice items and performance tasks require the students to apply knowledge from two or more mathematics strands. The item contexts are taken from other content areas. The open-

ended performance tasks require students to show their work and/or explain their thinking; these responses are scored holistically with rubrics.

There is no doubt that FCAT has influenced classroom activities. Many mathematics teachers and supervisors across the state have welcomed the problem- solving focus and are structuring instruction to address higher cognitive levels. Unfortunately, in some cases, the focus has shifted away from instruction to test preparation. Florida teachers need encouragement and assistance in keeping the focus on excellent instruction for the teaching and learning of mathematics.

Classroom Diversity

Florida's student population is growing in both numbers and diversity. Many of our classrooms are crowded; class size is of great concern. Additionally, classrooms include students with varied abilities, learning styles, and learning rates. There are students who are learning English as a second language, who do not read on grade level, and who are "at risk" for a variety of reasons. Classroom teachers need materials that will help them to meet the needs of all students.

Teachers also need more time to teach. Good instructional materials must provide teachers with a variety of materials so they do not have to spend time in developing new materials. When they do need to adapt or modify materials, they should be able to quickly do so to better meet the needs of students with diverse learning styles, experiences, and abilities.

Guiding Principles for Mathematics Education

Chapter 2 of the *Principles and Standards* for School Mathematics, 2000, is entitled "Principles for School Mathematics." Six principles are identified (page 11) as follows:

> Equity. Excellence in mathematics education requires equity—high expectations and strong support for all students.
>
> Curriculum. A curriculum is more than a collection of activities; it must be coherent, focused on important mathematics, and well articulated across the grades.
>
> Teaching. Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.
>
> Learning. Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
>
> Assessment. Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.

Technology. Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

These six principles are so closely associated that it is impossible to separate them and their effects. It is obvious that instructional materials influence and are influenced by all these principles, yet the curriculum principle is the one that is most closely related to instructional materials.

An effective curriculum:

- focuses on important mathematics that students will use in life and in subsequent mathematics study;
- identifies the "big ideas" in mathematics;
- consists of separate stands and provides for the connection and integration of the strands;
- forms a coherent whole, aiming toward a particular goal in each lesson but fitting together across the year and from one year to another; and
- provides guidance regarding the scope and sequence of mathematics, the degree of attention that should be given to particular topics at particular times and when mastery of a topic is expected.

Curriculum should not be driven by instructional materials. However, quality instructional materials should aim toward these same goals and can be enormously helpful to teachers and administrators and, in turn, to students. In Florida, the curriculum must include and may exceed the *Sunshine State Standards*.

Effective instructional materials help all students to learn mathematics, help all teachers to provide instruction and to continue to learn more about teaching, include an array of assessment approaches to yield feedback about learning and teaching, and incorporate technology into the teaching and learning.

Call for Materials for All Students

In an effort to serve all students in Florida, this call for resources is being made on behalf of all students enrolled in Florida's public schools. This includes students with identified disabilities as well as students with diverse learning needs. In attempting to meet the challenge of teaching all students, it is appropriate to remember that "All our students are gifted, and all are at-risk." (This is an anonymous quote recalled from a conference).

The instructional materials that are chosen in the next adoption process must support teachers and students in their efforts to meet the challenges and expectations described above. It is the goal of this document to identify criteria for instructional materials that will help to assure the best possible mathematics teaching and learning for every student in Florida.

Florida's Call for Inclusion of ESE Students

This adoption addresses the teaching of mathematics to all children. No longer will ESE Mathematics be a separate "call" with a separate adoption and a separate list of materials. That is not to say that all materials will be equally suitable for all children. Florida's State Adoption Committees may, as always, identify some submissions as "especially suitable" for a particular group of students. (Some groups may be reading below grade level or above grade level, may include reluctant readers, or those with specific processing difficulties.) Committee comments appear with adopted titles in the Florida Catalog of Adopted Materials and serve as a guide for teachers or administrators in search of materials. Each State Adoption Committee has at least one member, though usually more than one, who is or has been a certified teacher of ESE students.

Accommodations and Modifications

The following summary of information from the Department of Education guide *Accommodations: Assisting Students with Disabilities* (1999) is of help in addressing the ways that materials may be developed or changed to meet the needs of students of varied abilities:

Accommodations are changes that can be made in HOW students learn to assure that students with disabilities can participate as fully as possible in the general curriculum. Accommodations:

- do not change achievement expectations
- are a wide range of techniques and support systems that help students with disabilities work around any limitations that result from their disability. Examples include Braille textbooks or books on tape.
- may be needed by one student but frequently can also help other students in a classroom.
- "are made to the way students learn and how they are tested" (page 2).

Accommodations may be provided in five general areas:

- Instructional methods and materials
- Assignments and classroom assessments
- Time demands and scheduling
- Learning environment
- Use of special communication systems (page 2)

"Modifications are changes that can be made to ***what*** students are expected to learn" (page 48). They are used primarily for students who cannot meet the *Sunshine State Standards* and require a modified curriculum. Modifications change the goals and expectations for students.

Modifications may include:

- partial completion of program or course requirements
- curriculum expectations below age or grade level
- alternate assessment criteria
- alternate curricular goals (page 48)

Comments on 9-12 Courses

Remedial and ESE Courses

Mathematics: 9-12 and Life Skills Mathematics: 9-12 are Exceptional Student Education (ESE) courses. The course descriptions for these courses are highly detailed and descriptive. Some of the materials developed for these courses may also be used in Academic Skills for Functional Living, a course that contains a mathematics component but is not exclusively a mathematics course.

Intensive Mathematics is a remedial course for students who are struggling with some aspect of elementary or middle school mathematics. Enrollment is most frequent at the ninth grade level. Remedial courses may be counted as elective credit toward graduation. Intensive Mathematics may be the only math course for the student or it may be a course that is offered in addition to another mathematics course. It may be used as a remedial course for students who have low scores on the FCAT or some other test. The course may be offered in summer school, and it may be repeated as many times as needed. The course description indicates that the course should be designed to meet the needs of the enrolled students; it is also the responsibility of the district to assure that the identified benchmarks are consistent with the needs of the students. Some of the materials developed for this course may also be used in Mathematics: 9-12; or in Intensive Basic Skills which provides remediation in Language Arts as well as mathematics, or to meet the needs of students enrolled in higher level courses.

Students in Intensive Mathematics and ESE courses at the 9-12 level may need help with some major topic(s) from previous grades. Frequently, their major needs lie in a lack of understanding of concepts that support specific skills. These courses should not be paper-and-pencil drill courses. The course content should be directed toward active, hands-on learning and the development of problem-solving abilities. All content strands should be addressed with attention to the connecting and integration of the strands. If the primary need is in the number strand, then some needs may best be met through the integration of number into the other strands. Unfortunately, many of these students may have had limited opportunities to work in strands other than number; if so, they may have mathematical abilities that have never been discovered. Meeting specific needs in any strand begins with determining where the student's understanding really lies. Students should use manipulatives, calculators, computers, and other technology. In other words, materials for these courses should meet the criteria described in this document.

Although some of the students may be functioning at a lower grade level, they will need materials that are set in a context that is appealing for high school students. These are the students who most need excellent and engaging materials and excellent instruction. Their teachers may need assistance with the diagnosis and correction of mathematics difficulties.

Level 1 Courses

Level 1 Courses are fundamental or basic courses. Students may earn graduation credit (elective or to meet mathematics requirements) in these courses provided that certain requirements are met. Section 232.246(7)(d),F.S. states "the student's assessment indicates that a more rigorous course of study would be inappropriate, in which case a written assessment of the need must be included in the student's individual educational plan or in a student performance plan, signed by the principal, the guidance counselor, and the parent or guardian of the student, or the student if the student is 18 years of age or older." There are five Level 1 courses:

- Explorations in Mathematics I and II are intended to provide experiences to help students develop and extend their abilities in problem-solving, reasoning, communication, and building connections. Explorations I is most frequently taken during the ninth grade; Explorations II during the tenth grade.

- Business and Consumer Mathematics are taken across grades 9-12, with more students enrolled at grades 11 and 12.

- Pre-Algebra course membership spans grades six to 12, with the largest enrollment at the ninth grade, followed by the eighth grade. Usually, this course precedes Algebra I. This course is often used for middle school students in grades seven or eight with no intention that the course will count for high school graduation; in such cases, the documentation requirement stated above does not apply.

Algebra I and "Equivalent" Courses

Algebra I or its equivalent is now required for high school graduation. As this law was implemented, a two-course version of the course, Algebra Ia and Algebra Ib, was also created for the benefit of students who need more time to master the course. The course requirements are identical. Although Algebra I course enrollments occur in grades 6-12, the majority of students enrolled in Algebra and Algebra Ia are ninth graders.

The following courses, or series of courses, are deemed equivalent to Algebra I for graduation purposes because they contain the content of Algebra I:

- Algebra I Honors
- Applied Mathematics I and II
- Integrated Mathematics I and II

They also exceed the content of Algebra I and are not equivalent to one another. The Applied series contains some Pre-Algebra, Algebra I, and about a semester of Geometry. The Integrated I and II series contains all the content of Algebra I and much, if not all, the content of Geometry.

General Information

Florida requires three mathematics credits for high school graduation. Some districts and individual schools require four mathematics credits. The most common sequence for college preparation is the Algebra I, Geometry, Algebra II sequence. Some districts offer the Integrated series, Integrated Mathematics I, II, and III; this series contains the same content requirements as the more traditional sequence.

Over the past few years, there has been a decrease in the number of districts offering and the percent of students enrolling in Level 1 courses. There has been an increase in the percent of student enrollments in Level 2 courses (the regular, mainstream courses such as Algebra I and Geometry). The percent of student enrollments in Level 3 courses (honors courses and other advanced courses) has remained about the same.

Sources for The Florida Perspective on Mathematics

Florida Department of Education Documents:

- *Accommodations: Assisting Students With Disabilities, A Guide for Educators*, 1999. Available at the DOE Homepage (www.firn.edu/doe/commhome/).

- *FCAT Mathematics Test Item and Performance Task Specifications*, 2001. Available on the DOE Homepage (www.firn.edu/doe/sas/fcat.htm).

- *Florida Course Descriptions*, varying years. Available on the DOE Homepage (www.firn.edu/doe). Descriptions for called courses are in Appendix A.

- *Florida Curriculum Framework Mathematics*, 1996. Available at minimal charge through the Curriculum Support Section, 850 488 1701.

- *Florida Sunshine State Standards Mathematics*, 1996. Available at the DOE Homepage (www.firn.edu/doe). The *Standard*s are in Appendix A.

- *Sunshine State Standards for Special Diploma: Exceptional Student Education – Florida Curriculum Framework*, 1999. Available at the DOE Homepage (www.firn.edu/doe/commhome) under Publications.

National Council of Teachers of Mathematics. *Principles and Standards for School Mathematics*, 2000. Available at (**www.nctm.org)**.

✓Publishers' Submissions

Florida will accept for consideration bids configured as follows:

Mathematics: 9-12

Life Skills Mathematics: 9-12

Intensive Mathematics

Explorations in Mathematics I

Explorations in Mathematics II

Business Mathematics

Consumer Mathematics

Pre-Algebra

Algebra I / Algebra I Honors

Algebra Ia and Ib (one text or two-text series)

Integrated Mathematics I, II, and III (series only)

Applied Mathematics I and II (series) OR I, II, III (series)

Algebra II / Algebra II Honors

Geometry / Geometry Honors

Informal Geometry

Liberal Arts Mathematics

Trigonometry

Analytic Geometry

Pre-Calculus

Mathematical Analysis

Analysis of Functions

Calculus

Advanced Placement Calculus AB

Advanced Placement Calculus BC

Advanced Placement Statistics

Probability and Statistics with Applications

Major Priorities for Instructional Materials

The priorities as described in this specifications document were developed from research findings about what makes instructional materials effective. These priorities have undergone review by individuals who have served on state and district committees, by curriculum specialists, by instructional designers, by evaluation specialists, and by administrators of the statewide adoption system.

Instructional materials must be effective in three major priority areas: content, presentation, and learning. The following sections describe essential features for each of these priority areas. These features generally apply to all formats of instructional materials, whether print or other media/multiple media formats.

Content

Some features of content coverage have received progressively more attention over the past decade. These features include

A. ALIGNMENT WITH CURRICULUM REQUIREMENTS
B. LEVEL OF TREATMENT OF CONTENT
C. EXPERTISE FOR CONTENT DEVELOPMENT
D. ACCURACY OF CONTENT
E. CURRENTNESS OF CONTENT
F. AUTHENTICITY OF CONTENT
G. MULTICULTURAL REPRESENTATION
H. HUMANITY AND COMPASSION

The following sections describe the content features expected for each of these priority areas.

A. ALIGNMENT WITH CURRICULUM REQUIREMENTS

FLORIDA STATUTES

233.165(1)(b)—KEY WORDS: educational purpose… performance standards… instructional objectives… curriculum frameworks

233.25(3)(b)—KEY WORDS: written correlations… curricular objectives… performance standards

233.09(4)—KEY WORDS: curricular objectives… performance standards

233.09(4)(g)— KEY WORDS: independent investigation

233.061(1)—KEY WORDS: adopted standards

Content must align with the state's standards for the subject, grade level, and learning outcomes.

For grades 9-12, the content must include and be aligned with the *Sunshine State Standards* for the subject area of Mathematics. Additionally, the content must align with the specific course descriptions for called courses. The current course descriptions for these courses are included in Appendix A.

The *Sunshine State Standards* are arranged by content strands and in grade clusters, K-2, 3-5, 6-8, and 9-12. Each standard contains more specific Benchmarks. The *Sunshine State Standards* are approved by the State Board of Education, and, by Florida statute, instruction for the *Standards* must be provided by Florida's public school districts. These *Standards* are included in Appendix A of this document. They can be accessed in cluster format at the Department of Education Homepage (www.firn.edu/doe/curric).

For grades 9-12, instructional materials must also be aligned with the Florida course descriptions. (Note that the Course Descriptions were previously called Curriculum Frameworks.) The course descriptions for all "called" courses appear in Appendix A and may also be accessed through the DOE Homepage. The majority of these course descriptions have been revised to include related *Sunshine State Standards*. Many of the remaining course descriptions will be revised to align with the *Standards* during the 2001-2002 school year. When completed and approved by the State Board of Education, they will be available on the Homepage. Exceptional Student Education courses include related *Standards* in the *Sunshine State Standards* for Special Diploma.

Correlations. Publishers are **required** to provide correlation reports in the form of charts, tables, or lists to show exactly where and to what extent (mentioned or in-depth) the instructional materials cover **the materials described above.**

For grades 9-12, correlations must be provided to the content outcomes and related *Sunshine State Standards* Benchmarks as described in the specific course descriptions in Appendix A. Some districts appreciate a reference to the specific *Sunshine State Standards* Benchmark in the text chapters or activities. State Board of Education Rules require that districts omit no more than 10% of the course content as described in the course description; districts may add content as they wish. Since some of the advanced mathematics courses exceed the requirements of the *Standards*, the related *Standards* referenced in the course description are often prerequisite knowledge. For those courses, correlations to content requirements should receive more emphasis than correlation to the *Sunshine State Standards*.

It is strongly recommended that submissions for 9-12 courses also be correlated to the standards addressed in the *Principles and Standards for School Mathematics*, published by the National Council of Teachers of Mathematics (NCTM) in 2000. The *Principles and Standards* identifies ten standards. Five are content standards with names almost identical to the strands in Florida's *Sunshine State Standards*. NCTM's "process" standards are: Problem Solving, Reasoning and Proof, Communication, Connections, and Representation. All of these are integrated into the *Sunshine State Standards* to some degree, with a particular emphasis on problem solving. Correlations to the process standards would be particularly helpful to Florida educators.

NRT Correlations - Many Florida teachers would value correlations to the content listings for the norm-referenced test currently used statewide. (As of June, 2001, that test is Stanford 9 for grades 3-10.) Therefore, publishers are encouraged, but not required, to submit correlations to the content listings for the norm-referenced test(s) currently used statewide in Florida at the time programs are submitted for consideration.

Scope. The content should address Florida's required curriculum standards for the subject, grade level, and learning outcomes, including thinking and learning skills.

Completeness. The content of the major tool should be complete enough to stand on its own. To be useful for classroom instruction, instructional materials must be adaptable to the instructional goals and course outlines for individual school districts, as well as the state standards. Content should have no major omissions in the required content coverage, and be free of unrelated facts and information that would detract from achievement of Florida's specified grade level expectations.

B. LEVEL OF TREATMENT OF CONTENT

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORD: suitable

233.165(1)(a)—KEY WORDS: the age of the children

233.165(1)(c) —KEY WORDS: the degree to which the material would be supplemented or explained

The level of complexity or difficulty of content must be appropriate for the standards, student abilities and grade level, and time periods allowed for teaching.

Objectives. Content should be simple, complex, technical, or nontechnical enough for the intended objectives.

Students. Content should be developmentally appropriate for the age and maturity level of the intended students. It should contain sufficient details for students to understand the significance of the information presented and to engage in reflection and discussion.

Time. The level of complexity or difficulty of content also should allow for its coverage during the time periods available for teaching the subject. **In grades 9-12, many Florida schools use a schedule that provides 90 minute blocks of teaching time. Activities that help teachers use a variety of teaching strategies and team or group work are needed in such situations.**

C. EXPERTISE FOR CONTENT DEVELOPMENT

Expertise in the content area and in education of the intended students must be reflected in the authors, reviewers, and sources that contributed to the development of the materials.

Authorship. The authors, consultants, and reviewers must have actually contributed to the development of the instructional materials and should have credentials that reflect expertise in the

subject area, course, course category, grade level, pedagogy, education, teaching, or classroom instruction. Qualifications may include expertise in educational psychology or instructional design.

Sources. Primary and secondary sources should reflect expert information for the subject, such as relevant data from research, court decisions, diaries, autobiographies, artifacts, or historical sites. The type of sources considered appropriate will vary with the particular subject area.

D. ACCURACY OF CONTENT

Content must be accurate in historical context and contemporary facts and concepts.

FLORIDA STATUTES

233.25(9)—KEY WORDS: free from all errors

233.09(4)(e)—KEY WORDS: accurate, objective

Objectivity. Content that is included in the materials should accurately represent the domain of knowledge and events. It should be factual and objective. It should be free of mistakes, errors, inconsistencies, contradictions within itself, and biases of interpretation. It should be free of the biased selection of information. Materials should distinguish between facts and possible interpretations or opinions expressed about factual information. Visuals or other elements of instruction should contribute to the accuracy of text or narrative.

Representativeness. The selection of content should not misrepresent the domain of knowledge and events. It should include the generally accepted and prevalent truths, major concepts, standards, and models of the profession or discipline of the subject area.

Correctness. Presentation of content should be free of typographical and visual errors. It should include correct grammar, spelling, linguistics, terminology, definitions, descriptions, visuals, graphs, sounds, videos, and all other components of the instructional materials.

E. CURRENTNESS OF CONTENT

Content must be up-to-date for the academic discipline and the context in which the content is presented.

FLORIDA STATUTES

233.09(4)(e)—KEY WORD: current

233.25(9)—KEY WORD: up-to-date

Dates or editions. Copyright dates for photographs and other materials and editions should suggest sufficient currentness of content. Copyright dates and editions serve as indicators about currentness. However, neither the copyright date nor the edition guarantees currentness. In fact, second or third editions may or may not reflect more up-to-date information than first editions.

Informed examination of the text, narrative, and visuals contained in the materials provides the most direct information about currentness of the materials.

In mathematics, the content of the major tool and supportive materials should also reflect the current NCTM *Principles and Standards for School Mathematics*, published in 2000.

Context. Text or narrative, visuals, photographs, and other features should reflect the time periods appropriate for the objectives and the intended learners.

- Sometimes context should be current. For example, a photograph used to show stages of human growth and development will be more relevant when the clothing, hairstyles, and activities reflect present-day styles.
- Sometimes context should be historical. For example, illustrations and photographs of historical events should reflect the historical time period.
- Sometimes context should be both current and historical. For example, historic images alongside modern ones would convey changes in styles over time.

F. AUTHENTICITY

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils

233.09(4)(b)—KEY WORDS: humankind's place in ecological systems… conservation…dangerous substances

233.061(2)(e)—KEY WORDS: civil government… functions and interrelationships

233.061(2)(i)—KEY WORDS: effects…upon the human body and mind

233.09(4)(b)—KEY WORDS: conservation of natural

Content should include problem-centered connections to life in a context that is meaningful to students.

Life connections. Instructional materials should include connections to the student's life situations in order to make the content meaningful. Students might be expected to deal with time constraints, consider risks and trade-offs in decision-making, and work with teams. Connections may be made to situations of daily home life, careers, vocation, community events and services, and leisure or recreation. Connections may include hopes and dreams, choices and activities. **In mathematics, while it is essential that**

instructional materials make numerous connections to students' life situations, it is not essential that all activities have such connections. It is also essential to include content, investigations, and reflections that are purely mathematical and highly engaging for students.

Interdisciplinary treatment. Instructional materials also should include interdisciplinary connections in order to make content meaningful. Examples of situations that connect a variety of subject areas include building projects, playing sports, retrieving information or objects, balancing budgets, creating products, and researching information. In addition to subject area connections, instructional materials should connect the course or course category to other disciplines.

Examples of approaches to interdisciplinary connections include:

- explanations and activities for using skills and knowledge from other academic disciplines
- assignments that require students to use collateral learning from other disciplines rather than isolated knowledge or skills
- the focus on common themes across several subject areas (infusion, parallel, transdisciplinary, or multidisciplinary instruction)

Connections within mathematics. In mathematics, instructional materials should also explicitly build and identify connections that exist within the various strands of mathematics. For example, coordinate geometry allows the combining of algebra and geometry, so that relationships can be represented in algebraic generalizations and "seen" in visual graphs. Often the data that is used is obtained and analyzed with data analysis techniques.

Activities in a particular strand should involve material from other strands. Review and test questions should also combine content from multiple strands.

G. MULTICULTURAL REPRESENTATION

Portrayal of gender, ethnicity, age, work situations, and various social groups must include multicultural fairness and advocacy.

Multicultural fairness. It is not the number of pages devoted to diversity, equity, or work roles, but the substance of what is stated and portrayed that matters most. For this reason, it can be misleading to count the number of pages or illustrations devoted to a social issue or group. It is more important to focus on the integration of social diversity throughout a set of instructional materials.

Through balanced representation of cultures and groups in multiple settings, occupations, careers, and lifestyles, the materials should support equal opportunity without regard for age, color, gender, disability, national origin, race, or religion.

In addition to balanced representations, the portrayal of individuals and situations must exclude biases and stereotypes. These portrayals must promote an understanding and appreciation of the importance and contributions of diverse cultures and heritage.

233.061(2)(g)(o)(p)—KEY WORDS: contributions of African Americans…Hispanic contributions… women's contributions

Multicultural advocacy. The understanding and appreciation of multiple cultures extends beyond fair representation. It involves embracing a multicultural context, not just through pictures, but through information about ways to honor differences and deal with conflicts, promote a positive self-image for members of all groups, and provide for the development of healthy attitudes and values.

233.07(1)(a) and 233.16(1)(c)1.—KEY WORDS: address the broad racial, ethnic, socioeconomic, and cultural diversity of the student population

Effective treatment of multicultural issues requires consideration of the age and ability levels of students and whether or not it is appropriate to include multicultural issues in the study of a particular topic, such as the memorization of a formula or equation. Overall, however, materials should reflect both multicultural fairness and advocacy. **Mathematics provides abundant opportunities for multicultural links. Possibilities include historical connections and mathematical puzzles and games. For example, the Algebra we use today has contributions from numerous countries and peoples.**

H. HUMANITY AND COMPASSION

Portrayal of the appropriate care and treatment of people and animals must include compassion, sympathy, and consideration of their needs and values and exclude hard-core pornography and inhumane treatment.

Inclusion of compassion. When providing examples in narrative or visuals, materials sometimes depict the care and treatment of people and animals. Generally, this means showing in some way a measure of compassion, sympathy, or consideration of their needs and feelings.

Exclusion of inhumanity. In the context of personal and family values, Florida expressly prohibits material containing *hard-core pornography*. In addition, although the definition of *inhumane treatment* can sometimes appear to be controversial, as in science research, there is general agreement that instructional materials should not advocate any form of inhumane treatment.

As with the evaluation of multicultural representation, it is important to consider the context of the subject and the age and abilities of the students.

FLORIDA STATUTES

233.061(2)(f)—KEY WORDS: to be a responsible and respectful person

233.061(2)(j)—KEY WORDS: kindness to animals

233.09(4)(c)—KEY WORDS: humane treatment of people and animals

233.165(1)(a)—KEY WORDS: age of the children

233.165(2)—KEY WORD: pornography

REFERENCES FOR CONTENT FEATURES

For a complete list of references and citations, please refer to **Destination: Florida Classrooms—Evaluator's Handbook,** *or request a list of references from the Department of Education, Bureau of Curriculum, Instruction, and Assessment.*

Presentation

Features of presentation affect the practical usefulness of materials and the ease of finding and understanding content. These features include:

A. COMPREHENSIVENESS OF STUDENT AND TEACHER RESOURCES
B. ALIGNMENT OF INSTRUCTIONAL COMPONENTS
C. ORGANIZATION OF INSTRUCTIONAL MATERIALS
D. READABILITY OF INSTRUCTIONAL MATERIALS
E. PACING OF CONTENT
F. EASE OF USE OF MATERIALS

The following sections describe the presentation features expected for each of these areas.

A. COMPREHENSIVENESS OF STUDENT AND TEACHER RESOURCES

FLORIDA STATUTES

233.16(2)—KEY WORDS: suitable, usable

233.165(1)(c)—KEY WORDS: the degree to which the material would be supplemented or explained

Resources must be complete enough to address the targeted learning outcomes without requiring the teacher to prepare additional teaching materials for the course.

Materials should contain support for students in completing instructional activities and assessments and for teachers in implementing all of the instructional elements. A variety of components can accomplish this purpose. Typically, materials will include test items, study guides, outlines and strategies for teaching, media supplements, learning activities, review and practice activities, and projects.

The major components generally expected for student and teacher resources are listed below.

Student resources. Student materials typically include the major text or program with text or narration, visuals, assignments, and assessments. Formats may include print, audio, visual, digitized or computer-based, or other media.

Effective instructional materials generally integrate the use of reference aids (e.g., index, glossary, maps, bibliography, graphic organizers, and pictures) with the topic being studied. Items that guide students through materials might include clearly labeled materials, directions and explanations, and assignments with menus of choices.

Review and practice activities might include participation activities such as simulations, role-playing situations, investigations, and hands-on practice assignments. Review activities might include self-checks or quizzes. Formats might include worksheets, workbooks, journals, lab books, lab logs, charts, or maps. Feedback might be in the form of answer keys in student materials or in teacher materials. **Many Florida teachers stress that practice activities for procedural objectives such as algebraic procedures or the application of the Pythagorean Theorem should contain sufficient examples to meet the varying needs of students. Additional practice materials may be included in an Appendix or in ancillary materials.**

Review works best as a logical extension of content, goals, objectives, and lessons, with increased similarity to real-life situations. Review activities should require students to recall or apply previously taught knowledge and skills. Frequent short reviews over time or space improve learning more than a concentrated review. Assignments and stages of small practice improve speed and accuracy.

Other components might include enrichment and remediation activities, additional resources, and tests and assessment tools either in the student materials or in the teacher's guide or edition.

All of the findings listed above are essential to appropriate instructional materials for Florida students. In addition, the following are required with the goal of better meeting the needs of all students:

- **Student resources must include sufficient examples to represent the levels of rigor associated with the topic and with the related student exercises.**

- **Student materials, other than the major tool, must be copy- or print-ready. In addition, publishers are required to provide CD or web-accessible materials that can be downloaded and modified to meet the needs of the individual teacher or student.**
- **Student resources must include materials that are designed for student discovery or construction of concepts and are appropriate for labs, centers, individual or cooperative group work. These materials should be aimed at a variety of learning styles.**
- **The major tool and other materials must include activities that use manipulatives and technology, such as calculators, software programs, and websites, in engaging and appropriate ways.**
- **Student resources must include challenging and engaging problems, such as a problem of the week, that will require persistence over a period of time. Such problems allow time for reflection and thinking and for insight to occur.**
- **The major tool and other student materials must be consistent with the problem-solving focus of the *Sunshine State Standards*. Additionally, material consistent with the focus and format of the *Florida Comprehensive Assessment Test* must be embedded within the materials. Appropriate materials include activities and problems that address more than one mathematics strand; problems that are embedded in varied content areas; open-ended questions that require students to reflect upon, demonstrate, and explain their work (either orally or in writing); instruction in the use and/or construction of rubrics for grading performance tasks; creative tasks such as drawing models or constructing graphs; and multiple-choice questions that demand higher cognitive level thinking. In general, these attributes are not inconsistent with excellent instructional materials. The materials should be a natural part of the content presentation and should not be labeled as FCAT preparation materials.**

Specific FCAT preparation materials are not required. Should a publisher choose to offer such optional materials, they must be consistent with the *Sunshine State Standards* and correlated with the *FCAT Mathematics Test Item and Performance Task Specifications*. (These are available through the DOE Homepage.)

- **In mathematics classes, there are often students who are unable to read at the readability level of the mathematics materials. The language of mathematics is extremely challenging for poor readers because of the density of the complex language. Here density refers to the ratio of complex words to the total number of words in a reading passage. For these students, ancillary materials should include materials that have been written with simpler sentence structure and easier vocabulary, and that include more visuals.**

  To assist all students in reading and understanding mathematics terminology, the morphology of mathematical terms should be included in the major tool to teach the meaning of the "morphemes" that are the building blocks of the mathematical terms as they are being introduced or addressed. For example, the word "geometry" consists of "geo" which means "earth" and "metry" which is related to "measure." Thus, the word "geometry" literally means "earth measure;" of course, the meaning of the word has expanded over the centuries, but analysis of the morphemes leads to connections to "geology" and "geography" and to "meter" and "metric" and, most importantly, helps the students to infer the meanings of new words that they may encounter that contain the same or similar morphemes. Such analysis may also be helpful to non-English speaking students whose first languages use Greek or Latin roots that are used in many mathematics terms. (Vocabulary dictionaries that define roots, prefixes, and suffixes may be of help with this task.)

Teacher resources. Teacher materials typically include a teacher's edition with the annotated student text and copies of supplementary written materials with answer keys, worksheets,

tests, diagrams, etc., so that the teacher has to use only one guide. Publishers may make available inservice training, workshops, or consulting services to support teachers in implementing instructional materials. **Such professional development services are usually essential to the success of a mathematics program, particularly a program with non-traditional elements. Publishers should clearly indicate the recommended amount and types of professional development that are needed and work with districts and schools to assure that teachers receive the support that they need. Furthermore, materials for the teacher should aim at supporting continued teacher learning.**

Support, guidelines, resources, or features such as the ones described below help teachers to effectively implement materials in classroom and school settings.

1. **Components and materials that are easy to use:** Examples include clearance, license, or agreement for copying and use of materials; clear description and accurate directions for use of required equipment, facilities, resources, and environment; clearly labeled grade, lesson, content, and other information to identify components; correct specifications for making media and electronic programs work effectively. **Ease of use is a primary factor in the requirement that student materials be copy- or print-ready and that they be easily modified to meet teacher and student needs.**

2. **Materials to support lesson planning, teaching, and learning:** Examples include overview of components and objectives; background for lectures and discussions; technical terminology, and reinforcement and review strategies; scope and sequence chart for activities and planning; sample lesson plans; suggestions for individualized study, small-group and large-group presentations and discussions, school-to-work activities, field or laboratory experiences, and other extension activities; suggestions for integrating themes across the subject area or course curriculum and forming connections to other disciplines; suggestions for parental and community involvement; cultural highlights to explain and expand on the materials. **In mathematics, the sequence of specific topics or chapters is sometimes flexible. For example, data analysis**

techniques and some geometry topics could be done at any time. Suggestions for alternative sequences and/or "stand alone" topics would be helpful. In general, it is best to begin the instructional year with a fresh and engaging topic, not a review session.

3. **Suggestions for adapting instruction for varying needs:** Examples include alternative approaches to teaching, pacing, and options for varied delivery of instruction such as media, tools, equipment, and emerging technology such as digital media and electronic tools; strategies for engaging all students, such as open-ended questions to stimulate thinking, journals, manipulatives, explorations, and multisensory approaches; suggestions for addressing common student difficulties or adapting to multiple learning styles; and alternative reteaching, enrichment, and remediation strategies. **The mathematics teacher's guide should include a discussion of common errors and misunderstandings and ways to prevent or correct them, plus observation or questioning techniques that will help the teacher assess student understanding. Assessment materials should include varied print-ready assessments for different reading levels and a variety of learning styles.**

4. **Guidelines and resources on how to implement and evaluate instruction:** Examples include answers to work assignments, practice activities, and tests; possible outcomes of projects or research; suggestions for using learning tasks for classroom assessment; guidelines for alternative assessments, such as sample checklists, peer or performance assessments, portfolios, or projects. **All of these are extremely important in mathematics instruction.**

5. **Resources to use in classroom activities:** Examples include copy masters to use for displays or photocopies; bibliographies or lists of resources and references, including network resources; classroom management strategies and documentation on the manageability of the entire instructional program; in-service workshop or consultation support from the

publisher. **Again, all of these are extremely important in mathematics instruction.**

B. ALIGNMENT OF INSTRUCTIONAL COMPONENTS

FLORIDA STATUTE

233.07(4)—KEY WORDS: instructional materials… major tool…instruction of a subject or course

All components of an instructional package must align with each other, as well as with the curriculum.

All components of an instructional package—teacher's edition and materials, student's edition and materials, workbook, supplementary materials, and others—must be integrated and interdependent and must correspond with each other. For example, master copies of handouts in a teacher's edition should align with student activities or assignments. They must match in content and progression of instructional activities.

C. ORGANIZATION OF INSTRUCTIONAL MATERIALS

FLORIDA STATUTES

233.16(2)—KEY WORD: usable

233.165—KEY WORD: degree to which the material would be supplemented and explained

The structure and format of materials must have enough order and clarity to allow students and teachers to access content and explicitly identify ideas and sequences.

Providing an explicit and teachable structure can double the amount of information remembered. Clear organization allows students and teachers to discriminate important pieces of information through skimming, reading, or browsing.

Clear organization may be accomplished through a combination of features, but generally not through one feature alone.

Access to content. Some features help in searching and locating information, such as a table of contents; menu or map of content; directions on how to locate information or complete assignments; an index for quick reference; goals and/or objectives, outlines, lists, or checklists for major sections; bibliographies and lists of resources; glossaries for quick access to major terms; introductions, key concepts and themes, visual cues, illustrations, labeled examples, and labeled reviews or summaries.

Visible structure and format. Other at-a-glance features signal the organization of content, such as chapter or unit titles and/or frames; headings and subheadings; typographic cues such as bold,

italics or changes in size of type; divisions of content such as borders, boxes, circles, highlighting, visual signposts, icons, or color cues; diagrams, labels, and visuals placed near the related content; and numbering of pages and other components.

Objectives or a content outline may serve a similar purpose by introducing main ideas, providing guideposts to use in searching for key information, or serving as a checklist for self-assessment.

Certain types of brief narrative sections also contribute to clear organization. For example, the statement of a clear purpose with content organized around main ideas, principles, concepts, and logical relationships supports the unity and flow of information. Introductions also play a major role when they include anchoring ideas, a list of key points, or conceptual schemes such as metaphors. Summaries also can assist students in understanding the logical order of topics presented.

Logical organization. The pattern of organization of the content should be consistent and logical for the type of subject or topic. Patterns of organization may include comparison and contrast, time sequence, cause-effect or problem-solution-effect, concrete to abstract, introduction-review-extension (spiral structure), simple-to-complex, whole-part or part-whole, generalization-examples-review-practice, and conflict-inside view-structure.

In mathematics, the concrete to pictorial to abstract development is extremely important; it is equally as important that the content presentation effectively link the two. Often such a link is effected through teacher talk and the intermediary steps of drawing pictures and using algebraic sentences to record the actions with manipulatives. The need for concrete and/or pictorial representation continues in higher level mathematics courses. Technology and computer graphics programs have contributed immensely to the ability to "see" mathematical relationships.

The organization of presentation of a particular topic in mathematics is very dependent upon the nature of the material. There are some topics that need to be introduced with direct, explicit instruction, and others that need to be built upon classroom recall and mapping of previous learning. There are others that are perfect for student investigations that will allow students to have the thrill of discovery. Reflective questions embedded in or following such investigations will

help students and teachers consider what they have learned and how it relates to other mathematics topics or to other content disciplines.

D. READABILITY OF INSTRUCTIONAL MATERIALS

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORDS: suitable, usable, desirable

233.165(1)(a)—KEY WORDS: the age of the children

Narrative and visuals should engage students in reading or listening as well as in understanding of the content at a level appropriate to the students' abilities.

Language style. Language style and visual features can influence the readability of materials. Yet, a popular tool for assessing readability has been the use of a *readability formula* of one type or another. These formulas tend to focus only on a few *countable* characteristics of language style such as the length of words, sentences, and/or paragraphs.

Other features are more important in establishing the readability of instructional materials, such as

- organized, coherent text
- language and concepts familiar to the student
- language that clarifies, simplifies, and explains information
- transition words such as "yet," "also," "next," "for example," "moreover," or "however"
- other phrases that create logical connections
- words with concrete and specific images
- active rather than passive voice
- varied sentence structures, which avoid both choppy sentences and unnecessary words
- specific questions or directions to guide student attention to visuals or key information

Visual features. Visual features that improve readability include

- print that is dark and clear, with good contrast
- paper with clean-cut edges without glare, or computer screens without glare
- margins wide enough on a page or screen to allow easy viewing of the text
- visuals that are relevant, clear, vivid, and simple enough for students to understand

- quantity of visuals suitable for the intended students—both lower ability students and higher ability students tend to require more visuals
- unjustified text (ragged on the right) rather than justified (lined up on the right)
- visuals that contain information in a form different from the text
- graphs, charts, maps, and other visual representations integrated at their point of use
- colors, size of print, spacing, quantity, and type of visuals suitable for the abilities and needs of the intended students

E. PACING OF CONTENT

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORD: suitable

233.165(1)(a)—KEY WORDS: the age of the children

The amount of content presented at one time or the pace at which it is presented must be of a size or rate that allows students to perceive and understand it.

It is important that materials contain "bite-size" chunks or blocks of information. The chunks should not be so large, nor the pacing so fast, as to overwhelm students. Neither should the chunks be so small, nor the pacing so slow, as to bore them.

F. EASE OF USE OF MATERIALS

FLORIDA STATUTES

233.07(4)—KEY WORDS: instructional materials… major tool…instruction

233.25(3)(a)—KEY WORDS: specifications of the physical characteristics

233.16(2)—KEY WORDS: suitable, usable, desirable

233.165(1)(a)—KEY WORDS: the age of the children

233.165(1)(c)—KEY WORDS: the degree to which the material would be supplemented or explained

233.25(6)—KEY WORDS: not to exceed the lowest price

233.25(7)(8)(9)(10)—KEY WORDS: reduce automatically…free

Both print and other media formats of instructional materials must be easy to use and replace and be durable enough for multiple uses over time.

Warranty. The actual physical and technical qualities of materials should match the description contained in the publisher's warranty.

Use. Materials must be designed for practical use in the classroom and school environments. They must be easy to identify and store. Teachers and students must be able to access and use the materials. Some of the factors influencing their ease of use include number of components, size of components, packaging, quality of materials, equipment requirements, and cost to purchase or replace components.

The best choice about weight, size, and number of volumes depends on several factors, such as the organization of the content, how well separate volumes may fit time periods for instruction, and the ages of students. Technical production requirements, such as page limits or different types of bindings, may lead to multiple volumes.

Examples of classroom use include repeated copying of consumable materials and repeated use of other materials by students over time. Students should be able to easily use the materials and take home, in a convenient form, most of the material they need to learn for the course.

Technology-rich resources should work properly and run without error. Electronic media for student use should be encoded to prevent accidental or intentional erasure or modification. As with textbooks, electronic media should allow students to easily access and interact with them without extensive supervision or special assistance.

The physical and technical qualities of materials should match with the resources of the schools. Materials such as videos, software, CD-ROMs, Internet sites, and transparencies may serve instructional purposes well, but have little value unless they can be implemented with the school's equipment. Sometimes, a publisher provides training, inservice, or consultation to help in effective use of the materials.

Durability. Students and teachers should be able to have materials that will be durable under conditions of expected use. For example, boxes, books, or other materials should not fall apart after normal classroom use. The packaging and form of materials should be flexible and durable enough for multiple uses over time. Durability includes considerations such as

- high-quality paper, ink, binding, and cover
- back, joints, body block, and individual pages
- worry-free technology that runs properly, with easy to hear, see, and control audio and visuals, and
- the publisher's guarantee for replacement conditions and agreements for reproduction needed to effectively use the materials

Cost. *Florida's Department of Education Commissioner will consider the impact of cost in making final decisions.* Cost, while

not a direct factor in ease of use, influences the ease with which materials can be obtained or replaced. The impact of cost can be complex to estimate. It requires considering the number of materials available at no additional cost with the purchase of the major program or text, the cost over the adoption period of several years, and the number of free materials to support implementation. Attractive features such as higher quality paper and visuals and greater use of color may escalate cost, without enhancing learning effectiveness.

REFERENCES FOR PRESENTATION FEATURES

For a complete list of references and citations, please refer to **Destination: Florida Classrooms—Evaluator's Handbook,** *or request a list of references from the Department of Education, Bureau of Curriculum, Instruction, and Assessment.*

Learning

The following features have been found to promote learning and apply to most types of learning outcomes.

A. MOTIVATIONAL STRATEGIES
B. TEACHING A FEW "BIG IDEAS"
C. EXPLICIT INSTRUCTION
D. GUIDANCE AND SUPPORT
E. ACTIVE PARTICIPATION
F. TARGETED INSTRUCTIONAL STRATEGIES
G. TARGETED ASSESSMENT STRATEGIES

The following sections describe the learning features expected for each of these priority areas.

A. MOTIVATIONAL STRATEGIES

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORDS: suitable, usable, desirable

233.165(1)(a)—KEY WORDS: the age of the children

233.25(5)—KEY WORDS: diagnostic, criterion-referenced

Instructional materials must include features to maintain learner motivation.

Expectations. Materials should positively influence the expectations of students. Examples include:

- positive expectations for success
- novel tasks or other approaches to arouse curiosity
- meaningful tasks related to student interests, cultural backgrounds, and developmental levels
- activities with relevance to the student's life
- thought-provoking challenges such as paradoxes, dilemmas, problems, puzzles, controversies, and questioning of traditional ways of thinking

- challenges that are neither too difficult to achieve nor so easy that students become bored
- hands-on tasks in a concrete context, and images, sounds, analogies, metaphors, or humorous anecdotes
- variety, including the opportunity for students to ask their own questions, set their own goals, and make other choices during learning

Feedback. Materials should include informative and positive feedback on progress. Examples include:

- frequent checks on progress, including testing
- explanatory feedback with information about correctness of responses, how to avoid or correct common mistakes, and/or different approaches to use
- varied forms of assessments (self-assessment, peer assessment, and some learning tasks without formal assessments)

Appearance. Materials should have an appearance generally considered attractive to the intended students.

B. TEACHING A FEW "BIG IDEAS"

Instructional materials should thoroughly teach a few important ideas, concepts, or themes.

Focus. Thoroughly teaching a few big ideas provides focus for the learner's attention. It provides an organizing framework for integrating new information.

Completeness. The thorough teaching of a few big ideas may focus on developing a deeper and more complete understanding of the major themes of a discipline, the content of the subject area, relationships to other disciplines, and the thinking and learning skills required for achieving the specified learning outcomes.

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORDS: suitable, usable

233.165(1)(b)—KEY WORDS: educational purpose

C. EXPLICIT INSTRUCTION

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORDS: suitable, usable

233.165(1)(b)—KEY WORDS: educational purpose

Instructional materials must contain clear statements of information and outcomes.

Clarity of directions and explanations. To support success in learning, instructional materials should include clear presentation and explanations of

- purposes, goals, and expected outcomes
- concepts, rules, information, and terms
- models, examples, questions, and feedback

For example, development of specific thinking skills requires an explicit statement of the particular *thinking skills* to be learned, along with the *strategies* or *steps to follow*. Explicit instruction for thinking skills might also involve showing *examples* of successful thinking contrasted with examples of poor thinking processes.

Similarly, the development of learning skills requires explicit directions about *when* and *how* to do activities such as notetaking, outlining, paraphrasing, abstracting and analyzing, summarizing, self-coaching, memory strategies, persistence, preview and questioning, reading and listening, reflecting, and reciting.

Exclusion of ambiguity. Instructional materials should avoid terms and phrases with ambiguous meanings, confusing directions or descriptions, and inadequate explanations. **In mathematics, there is sometimes confusion about such words as "similar" which has a more specific meaning in geometry than in everyday life or "base" which has multiple meanings in mathematics and in daily life. These terms cannot be avoided; thus the different meanings need to be discussed and explained.**

D. GUIDANCE AND SUPPORT

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORDS: suitable, usable, desirable

Instructional materials must include guidance and support to help students safely and successfully become more independent learners and thinkers.

Level. The type of guidance and support that helps students to become more independent learners and thinkers is sometimes referred to as *scaffolding.* Scaffolding is a solid structure of support that can be removed after a job has been completed. As students gain proficiency, support can diminish, and students can

encounter more complex, life-centered problems. Information and activities should provide guidance and support at the level that is needed—no more and no less. Too much can squelch student interest, and too little can lead to failure.

Guidance and support can be accomplished by a combination of the following features:

- organized routines
- advance organizers or models such as
  (1) condensed outlines or overviews
  (2) simplified views of information
  (3) visual representations of new information during initial instruction
  (4) sample problems
  (5) questions to focus on key ideas or important features
  (6) examples of solved problems
  (7) explanations of how the problems were solved
  (8) examples of finished products or sample performances
  (9) analogies, metaphors, or associations to compare one idea to another
- prompts or hints during initial practice
- step-by-step instructions
- immediate and corrective feedback on the accuracy of performance of each step or task, on how to learn from mistakes, and on how to reach the correct answer
- simulations with features for realistic practice
- opportunities for students to do research, and to organize and communicate results

Adaptability. Guidance and support must be adaptable to developmental differences and various learning styles. For example, young children tend to understand concepts in concrete terms and overgeneralize new concepts. Some students need more time, some tend to be more impulsive than reflective, some have trouble distinguishing relevant from irrelevant information, and some have better written than spoken language skills.

Approaches for developmental differences and learning styles of students, include

- a variety of *activities* such as
  (1) structured and unstructured activities
  (2) independent and group work
  (3) teacher-directed and discovery learning

(4) visual and narrative instruction
(5) hands-on activities
(6) open-ended activities
(7) practice without extrinsic rewards or grades
(8) simple, complex, concrete, and abstract examples
(9) variable pacing or visual breaks

- a variety of *modalities* for the various multiple intelligences of students, such as
  (1) linguistic-verbal
  (2) logical-mathematical
  (3) musical
  (4) spatial
  (5) bodily-kinesthetic
  (6) interpersonal
  (7) intrapersonal

E. ACTIVE PARTICIPATION OF STUDENTS

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORDS: suitable, usable, desirable

233.165(1)(a)—KEY WORDS: the age of the children

Instructional materials must engage the physical and mental activity of students during the learning process.

Assignments. Instructional materials should include organized activities of periodic, frequent, short assignments that are logical extensions of content, goals, and objectives.

Student responses. Assignments should include questions and application activities during learning that give students opportunities to respond. Active participation of students can be accomplished in a variety of ways. For example, information and activities might require students to accomplish the types of activities listed below.

- respond orally or in writing
- create visual representations (charts, graphs, diagrams, and illustrations)
- generate products
- generate their own questions or examples
- think of new situations for applying or extending what they learn
- complete discovery activities
- add details to big ideas or concepts from prior knowledge
- form their own analogies and metaphors
- practice lesson-related tasks, procedures, behaviors, or skills

- choose from a variety of activities

For mathematics instruction, this list is rich in ways to increase communication and creativity in the classroom. The choice of a variety of activities is important in helping students to assume responsibility for themselves and their own learning.

F. TARGETED INSTRUCTIONAL STRATEGIES

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORDS: suitable, usable, desirable

233.165(1)(a)—KEY WORDS: the age of the children

233.061(2) KEY WORDS: approved methods of instruction

Instructional materials should include the strategies known to be successful for teaching the learning outcomes targeted in the curriculum requirements.

Alignment. Research has documented the strategies that effectively teach different types of learning outcomes. The learning strategies included in instructional materials should match the findings of research for the targeted learning outcomes. Different types of learning outcomes require different strategies. For example, a strategy for memorizing verbal information might be helpful, but it would not align with the strategies required for learning a concept or for learning how to solve a problem.

Completeness. Not only should strategies be aligned, but they also should be complete enough to effectively teach the targeted outcomes. For example, while the explanation of a problem-solving method or model would be appropriate, other strategies also would be necessary in order for students to learn how to resolve different types of problems.

To extend the problem-solving example in mathematics, students may learn how to determine and express relationships from a set of data by writing algebraic equations or by graphing on a coordinate plane. They may learn each approach individually. However, they will also encounter situations where they must choose the best approach for the particular situation.

Research summary. Researchers sometimes use different terms for some similar outcomes. For example, *thinking skills* and *metacognition* refer to some of the same types of skills. The following alphabetical list includes terms as they have appeared in research, even though some terms clearly overlap with each other.

- attitudes
- cognitive strategies
- comprehension/ understanding
- concepts
- creativity
- critical thinking
- insight
- metacognition
- motor skills
- multiple intelligences
- problem solving
- procedural knowledge, principles, and rules
- scientific inquiry
- thinking skills
- verbal information, knowledge, or facts

The following section summarizes the research findings for each of these types of learning outcomes.

Effective Teaching Strategies

- ***To teach* Attitudes*—for example, helping students to believe that they can learn mathematics***
    - Explain and show consequences of choices, actions, or behaviors.
    - Provide relevant human or social models that portray the desired choices, actions, or behaviors

  In mathematics, students must be enticed by engaging activities and reassured by success. Materials and teachers must deliver the message that mathematics is accessible to all students.

- **To teach** *Cognitive Strategies* (learning how to learn)**—for example, self-monitoring and reflecting upon the effectiveness of the problem-solving strategy selected and used**
    - Encourage or teach (a) organizing and summarizing information; (b) self-questioning, self-reflection, and self-evaluation; and (c) reference skills.
    - Encourage or teach when and how to use these different skills.

- **To teach** *Comprehension/Understanding***—for example, comprehending and understanding information in a mathematics reading selection**
- Outline, explain, or visually show what will be learned in a simple form.
- Explain with concrete examples, metaphors, questions, or visual representations.
- Require students to relate new to previously learned information.
- Require students to paraphrase or summarize new information.
- Require students to construct a visual representation of main ideas (map, table, diagram, etc.).
- Give students opportunities to add details, explanations, or examples to basic information.
- Require application of knowledge or information.

- **To teach** *Concepts***—for example, learning the properties of similar geometric figures.**
  - Provide clear definition of each concept.
  - Point out important and unimportant features or ideas.
  - Point out examples and non-examples of the concept, showing similarities and differences.
  - Include practice in classifying concepts.
  - Include a wide range of examples in progressive presentation of more complex examples.
  - Emphasize relationships between concepts.

  In mathematics, the examples should be as concrete as possible, and, whenever possible, students should investigate examples and non-examples, identify the attributes or properties of the concept, and help to form the definition.

- **To teach** *Creativity***—for example, using varied problem-solving approaches or creating models for mathematical relationships**
  - Provide examples of creativity.
  - Include models, metaphors, and analogies.
  - Encourage novel approaches to situations and problems.
  - Show and provide practice in turning a problem upside down or inside out or changing perceptions.

- Encourage brainstorming.
- Include questions and problems with multiple answers.
- Provide opportunities of ungraded, unevaluated creative performance and behavior.

In mathematics, creativity is shown in activities such as creating graphs, writing problems, or applying computer programs to investigate geometric relationships.

- **To teach** *Critical Thinking*—**for example, judging whether an answer is reasonable or determining the validity of explanations**
  - Create conflict or perplexity by using paradoxes, dilemmas, or other situations to challenge concepts, beliefs, ideas, and attitudes.
  - Focus on how to recognize and generate proof, logic, argument, and criteria for judgments.
  - Include practice in detecting mistakes, false analogies, relevant v. irrelevant issues, contradictions, "buggy" algorithms, and predictions.
  - Provide practice in drawing inferences from observations and making predictions from limited information.
  - Explain and provide practice in recognizing factors that influence choice and interpretations such as culture, experience, preferences, desires, interests, and passions, as well as systematic thinking.
  - Require students to explain how they form new judgments and how and why present judgments differ from previous ones.

In mathematics, critical thinking is exhibited in many ways. For example students estimate reasonable answers, explain and demonstrate the meanings of number sentences or operations, explain how they reached solutions, justify their work, use deductive reasoning in proof, develop rules for relationships (such as finding the area of plane figures), and make and check the validity of conjectures.

- **To teach** *Insight*—**for example, noting the connections between mathematics and physics or sociology.**

  - Include inquiry and discovery activities.

- Provide challenging thinking situations with concrete data to manipulate.
- Promote careful observation, analysis, description, and definition.

In mathematics, insight can be modeled through presenting stories of mathematicians who exhibited insightful thinking. For example, the young Gauss discovered a rule for finding the sum of all the whole numbers, 1 to 100. Insight may also be encouraged by teachers and materials that value varied problem-solving approaches and unique solutions or connections.

- **To teach** *Metacognition* (learning how to think)**—for example, rereading and self-correcting written explanations of problem solving**
  - Explain different types of thinking strategies and when to use them.
  - Encourage self-evaluation and reflection.
  - Include questions to get students to wonder why they are doing what they are doing.
  - Guide students in how to do systematic inquiry, detect flaws in thinking, and adjust patterns of thinking.
- **To teach** *Motor Skills***—for example, using measurement or electronic tools proficiently**
  - Provide a mental and physical model of desired performance.
  - Describe steps in the performance.
  - Provide practice with kinesthetic and corrective feedback (coaching).
- **To teach** *Multiple Intelligences***—for example, student groups plan and present as they choose the results of their research, investigation, or problem solving**
  - Verbal-linguistic dimension focuses on reasoning with language, rhythms, and inflections, such as determining meaning and order of words (stories, readings, humor, rhyme, and song).
  - Logical-mathematical dimension focuses on reasoning with patterns and strings of symbols (pattern blocks, activities to form numbers and letters).
  - Musical dimension focuses on appreciation and production of musical pitch, melody, and tone.

- Spatial dimension focuses on activities of perceiving and transforming perceptions.
- Bodily kinesthetic dimension focuses on use and control of body and objects.
- Interpersonal dimension focuses on sensing needs, thoughts, and feelings of others.
- Intrapersonal dimension focuses on recognizing and responding to one's own needs, thoughts, and feelings.

Active learning of mathematics should incorporate all the intelligences identified above. Physical interaction with objects, games, the environment, and interactive computer programs are all essential to understanding in mathematics.

- **To teach** *Problem Solving*—**for example, forming predictions, inferences, logical endings, or conclusions**
  - Assure student readiness by diagnosing and strengthening related concept, rule, and decision-making skills.
  - Provide broad problem-solving methods and models.
  - Include practice in solving different types of problems.
  - Begin with highly structured problems and then gradually move to less structured ones.
  - Use questions to guide thinking about problem components, goals, and issues.
  - Provide guidance in observing and gathering information, asking appropriate questions, and generating solutions.
  - Include practice in finding trouble, inequities, contradictions, or difficulties and in reframing problems.
  - Include drill and practice to improve speed, consistency, and ease of using problem-solving steps.
- **To teach** *Procedural Knowledge, Principles, and Rules*—**for example, procedures for constructing graphs**
  - Define context, problems, situations, or goals for which procedures are appropriate.
  - Explain reasons that procedures work for different types of situations.
  - Define procedures—procedures include rules, principles, and/or steps.

- Provide vocabulary and concepts related to procedures.
- Demonstrate step-by-step application of procedures.
- Explain steps as they are applied.
- Include practice in applying procedures.

- **To teach** *Scientific Inquiry***—for example, transferring information gathered and recorded into a formal presentation**
  - Explain process and methods of scientific inquiry.
  - Explain and provide examples of (a) typical solution procedures, (b) how to form hypotheses, (c) how to speculate, and (d) how to identify and interpret consequences.
  - Encourage independent thinking and avoidance of dead ends or simplistic answers.
  - Require students to explain experiences with inquiry activities and results of inquiry activities.

- **To teach** *Thinking Skills* (also refer to critical thinking and metacognitive skills)**—for example, comparing and contrasting numeric and algebraic sentences**
  - Introduce different types of thinking strategies.
  - Explain context or conditions of applying different strategies.
  - Provide definitions, steps, and lists to use in strategies.
  - Include examples of different types of thinking strategies, including how to think with open-mindedness, responsibility, and accuracy.
  - Emphasize persisting when answers are not apparent.
  - Provide practice in applying, transferring, and elaborating on thinking strategies.
  - Integrate metacognitive, critical, and creative-thinking skills.

- **To teach** *Verbal Information, Knowledge, or Facts***—for example, new mathematics vocabulary**
  - Provide a meaningful context to link new information and past and/or future knowledge.
  - Organize information into coherent groups or themes.
  - Use devices to improve memory such as mnemonic patterns, maps, charts, comparisons, groupings, highlighting of key words or first letters, visual images, and rhymes.

- Include some overlearning and mastery through practice in rehearsal, recall, or restatement of information (refer to *comprehension*).
- Point out parts, main ideas, pattern, or relationships within information or sets of facts.

G. TARGETED ASSESSMENT STRATEGIES

FLORIDA STATUTES

233.09(4)(e)—KEY WORDS: suited to the needs and comprehension of pupils at their respective grade levels

233.16(2)—KEY WORDS: suitable, usable, desirable

233.165(1)(a)—KEY WORDS: the age of the children

233.25(5)—KEY WORDS: diagnostic, criterion-referenced

Instructional materials should include assessment strategies that are known to be successful in determining how well students have achieved the targeted learning outcomes.

Alignment. The assessment strategies should match the learner performance requirements for the types of learning outcomes that have been targeted for the subject matter, course, or course category. Different strategies are appropriate for assessing different types of learning outcomes. For example, a strategy for testing the acquisition of verbal information would not match the requirements for testing whether or not a student has learned a concept or learned how to solve a problem.

The term "assessment," as used in this section, refers to testing or other strategies that assess student progress as a result of learning activities. The results of such assessment provide information about where to strengthen instruction. But it is very important to ask the right questions. If the type of question matches the type of learning outcome, then students and teachers have relevant information about learning progress.

Completeness. In addition to including assessment strategies that align with the performance requirements of the targeted learning outcomes, the strategies should be complete enough to effectively assess the learner's performance requirements required by the targeted learner outcomes. For example, a test item that requires the student to state a rule does not assess whether or not the student knows how to *use* the rule. **Similarly, in mathematics, asking the student to identify the correct algebraic equation for a particular relationship does not assess whether the student could write the equation or explain his or her thinking regarding the relationship.**

Research summary. The research summary for effective assessment strategies for different types of learning outcomes follows the same alphabetical sequence as the previous section.

Effective Assessment Strategies

- **To assess** *Attitudes:*
  - Provide various situations.
  - Require choices about behaviors.
- **To assess** *Cognitive Strategies:*
  - Provide learning tasks.
  - Require students to choose good strategies for learning and/or to learn new materials without teacher guidance.
  - Require students to discuss and explain methods used for various learning tasks.
- **To assess** *Comprehension/Understanding:*
  - Provide topic.
  - Require summary or restatement of information.
  - Provide new context.
  - Require application of information.
  - Provide several statements using words different from the initial teaching.
  - Require identification of the correct meaning.
- **To assess** *Concepts:*
  - Provide new examples and non-examples.
  - Require identification or classification into the correct categories.
- **To assess** *Creativity:*
  - Provide new problems to "turn upside down," study, or resolve—these could be puzzles, dance performances, drama performances, or products to create.
  - Require products or solutions to fit within the particular functions and resources.
  - Provide situations requiring novel approaches.
- **To assess** *Critical Thinking:*
  - Require students to evaluate information or results.
  - Require the use of analysis and research.

- **To assess** *Insight:*
  - Provide situations for inquiry and discovery.
  - Provide situations for manipulation.
- **To assess** *Metacognition* (learning how to think):
  - Provide different situations or problems.
  - Require students to identify types of thinking strategies to analyze and evaluate their own thinking.
- **To assess** *Multiple Intelligences:*
  - Provide situations in the modality that is targeted, e.g., verbal-linguistic, musical, or other modality.
  - Provide situations in several modalities, to allow choice
  - Require performance in the targeted or chosen modalities.
- **To assess** *Motor Skills:*
  - Provide situations and resources for performance of the skill.
  - Include checklist for evaluation.
- **To assess** *Problem Solving:*
  - Require students to choose types of problem-solving strategies for different situations.
  - Require solutions to structured and unstructured, simple and complex problems.
- **To assess** *Procedural Knowledge, Principles, and Rules:*
  - Provide situations that require students to recognize the correct use of procedures, principles, or rules with routine problems.
  - Require students to state procedures, principles, or rules.
  - Require students to choose which ones to apply in different situations.
  - Provide situations that require students to demonstrate the correct use of procedures, principles, or rules with routine problems.
- **To assess** *Scientific Inquiry:*
  - Provide situations or problems that require speculation, inquiry, and hypothesis formation.
  - Provide research, hands-on activity, and conclusions.

- **To assess** *Thinking Skills* (also refer to critical thinking and metacognitive skills):
    - Require students to summarize different types of thinking strategies.
    - Provide situations that require students to choose the best type of thinking strategy to use.
    - Require students to detect instances of open- v. closed-mindedness.
    - Require students to detect instances of responsible v. irresponsible and accurate v. inaccurate applications of thinking strategies.
    - Provide situations that require the student's persistence in order to discover or analyze information to obtain answers to specific questions.
    - Require students to apply specific thinking strategies to different real-world situations.
- **To assess** *Verbal Information, Knowledge, or Facts:*
    - Require students to recall information.
    - Require students to restate information.

REFERENCES FOR LEARNING FEATURES

For a complete list of references and citations, please refer to **Destination: Florida Classrooms—Evaluator's Handbook,** *or request a list of references from the Department of Education, Bureau of Curriculum, Instruction, and Assessment.*

Criteria for Evaluation of Instructional Materials

The instructional materials adoption process must be fair to all publishers who take the time and expense to submit their materials. Applying evaluation criteria consistently to each submission assures that the materials will be judged fairly.

Regardless of format or technology, effective materials have certain characteristics in common, and the basic issues, important for the evaluation of instructional materials, apply to all subject areas and all formats. These issues are addressed in Florida's list of priorities and the criteria as detailed in the previous pages of this document. What follows is the evaluation instrument used by adoption committee members. Evaluators will use the following criteria-based instrument to engage in systematic reflection of the processes they follow and decisions they make about the quality of materials submitted by publishers.

The extensive research base and review processes used to identify these criteria establish their validity as an integral part of Florida's instructional materials adoption system. Applying these criteria consistently to each submission helps assure that the materials submitted by publishers will be judged fairly.

STATE COMMITTEE EVALUATION FORM

DIRECTIONS: *Use this form along with the criteria in the instructional materials specifications to independently review each submission.*

As part of your independent review for each of the criteria, rate and comment on how well the submission satisfies the requirements. Possible ratings are as follows: ■ THOROUGHLY, ■ HIGHLY, ■ ADEQUATELY , ■ MINIMALLY , *or* ■ NOT AT ALL .

At your state committee meeting, you will discuss your review and agree on the summary of RATINGS, COMMENTS, and the OVERALL EVALUATION for each submission. Your committee will then VOTE for or against adoption and will make suggestions for notations to include in the Florida Catalog of Instructional Materials*. Your committee's decisions will appear on one Committee Consensus Questionnaire.*

IDENTIFICATION OF SUBMISSION
Subject Area Committee
Course for Which Recommended
Name of Publisher
Title of Submission

CONTENT

A. ALIGNMENT WITH CURRICULUM REQUIREMENTS

Content aligns with the state's standards for the subject, grade level, and learning outcomes.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

CORRELATIONS_____

SCOPE_____

COMPLETENESS _____

B. LEVEL OF TREATMENT OF CONTENT

The level of complexity or difficulty of content is appropriate for the standards, student abilities and grade level, and time periods allowed for teaching.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

OBJECTIVES_____

STUDENTS_____

TIME_____

C. EXPERTISE FOR CONTENT DEVELOPMENT

Expertise in the content area and in education of the intended students are reflected in the authors, reviewers, and sources that contributed to development of the materials.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

AUTHORSHIP_____

SOURCES _____

D. ACCURACY OF CONTENT

Content is accurate in historical context and contemporary facts and concepts.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

OBJECTIVITY_____

REPRESENTATIVENESS_____

CORRECTNESS_____

E. CURRENTNESS OF CONTENT

Content is up-to-date for the academic discipline and the context in which the content is presented.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

DATES OR EDITIONS_____

CONTEXT_____

INFORMATION_____

F. AUTHENTICITY OF CONTENT

Content includes problem-centered connections to life in a context that is meaningful to students.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

LIFE CONNECTIONS_____

INTERDISCIPLINARY TREATMENT_____

G. MULTICULTURAL REPRESENTATION

Portrayal of gender, ethnicity, age, work situations, and social groups includes multicultural fairness and advocacy.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

MULTICULTURAL FAIRNESS_____

MULTICULTURAL ADVOCACY_____

H. HUMANITY AND COMPASSION

Portrayal of the appropriate care and treatment of people and animals includes compassion, sympathy, and consideration of their needs and values and excludes hard-core pornography and inhumane treatment.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

INCLUSION OF COMPASSION_____

EXCLUSION OF INHUMANITY _____

SUMMARY ANALYSIS FOR CONTENT

In general, how well does the submission satisfy *CONTENT* requirements?

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

PRESENTATION

A. COMPREHENSIVENESS OF STUDENT AND TEACHER RESOURCES

Resources are complete enough to address the targeted learning outcomes without requiring the teacher to prepare additional teaching materials for the course.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

STUDENT RESOURCES_____

TEACHER RESOURCES_____

B. ALIGNMENT OF INSTRUCTIONAL COMPONENTS

All components of an instructional package align with each other, as well as with the curriculum.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issue? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

ALIGNMENT_____

C. ORGANIZATION OF INSTRUCTIONAL MATERIALS

The structure and format of materials have enough order and clarity to allow students and teachers to access content and explicitly identify ideas and sequences.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

ACCESS TO CONTENT_____

VISIBLE STRUCTURE AND FORMAT_____

LOGICAL ORGANIZATION_____

D. READABILITY OF INSTRUCTIONAL MATERIALS

Narrative and visuals will engage students in reading or listening as well as understanding of the content.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

LANGUAGE STYLE_____

VISUAL FEATURES_____

E. PACING OF CONTENT

The amount or content presented at one time or the pace at which it is presented is of a size or rate that allows students to perceive and understand it.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issue? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

PACING_____

F. EASE OF USE OF MATERIALS

Both print and other media formats of instructional materials are easy to use and replace and are durable enough for multiple uses over time.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

WARRANTY_____

USE_____

DURABILITY_____

SUMMARY ANALYSIS FOR PRESENTATION

In general, how well does the submission satisfy *PRESENTATION* requirements?

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

LEARNING

A. MOTIVATIONAL STRATEGIES

Instructional materials include features to maintain learner motivation.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

EXPECTATIONS_____

FEEDBACK_____

APPEARANCE_____

B. TEACHING A FEW "BIG IDEAS"

Instructional materials thoroughly teach a few important ideas, concepts, or themes.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

FOCUS_____

COMPLETENESS_____

C. EXPLICIT INSTRUCTION

Instructional materials contain clear statements of information and outcomes.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

CLARITY OF DIRECTIONS AND EXPLANATIONS_____

EXCLUSIONS OF AMBIGUITY_____

D. GUIDANCE AND SUPPORT

Instructional materials include guidance and support to help students safely and successfully become more independent learners and thinkers.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

LEVEL_____

ADAPTABILITY_____

E. ACTIVE PARTICIPATION OF STUDENTS

Instructional materials will engage the physical and mental activity of students during the learning process.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

ASSIGNMENTS_____

STUDENT RESPONSES_____

F. TARGETED INSTRUCTIONAL STRATEGIES

Instructional materials include the strategies known to be successful for teaching the learning outcomes targeted in the curriculum requirements.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

ALIGNMENT_____

COMPLETENESS_____

G. TARGETED ASSESSMENT STRATEGIES

Instructional materials include assessment strategies known to be successful in determining how well students have achieved learning outcomes targeted in the curriculum requirements.

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

What COMMENTS, if any, do you have about the strengths or concerns for the following issues? *(Please give specific examples with page numbers. Extra space for notations is provided on page 8.)*

ALIGNMENT_____

COMPLETENESS_____

SUMMARY ANALYSIS FOR LEARNING

In general, how well does the submission satisfy *LEARNING* requirements?

THOROUGHLY HIGHLY ADEQUATELY MINIMALLY NOT AT ALL

OVERALL EVALUATION

1. If given responsibility for teaching the course, would you choose these materials for classroom use?

❑ **YES** ❑ **NO**

2. What notations do you think should be included in the Catalog?

Committee Member Signature **Date**

Sunshine State Standards
Mathematics

Introduction

The Sunshine State Standards identify what Florida public school students should know and be able to during each of four grade clusters that represent developmental levels: PreK-2, 3-5, 6-8, 9-12. They describe the student achievement that the state will hold schools accountable for students learning in the subject areas of language arts, mathematics, science, social studies, music, visual arts, theatre, dance, health, physical education, and foreign languages.

The Sunshine State Standards will affect many aspects of schooling in Florida. The curriculum and instruction--what teachers teach and how they teach it--must be organized around these standards. The state will be assessing reading, writing, and mathematics based on the standards. At the local level, once the state standards have been implemented, then classroom tests should be geared to those standards. Finally, the systems used to report student progress--report cards and transcripts--should have a clear relationship to the standards. In short, the standards should be the starting point for much that is done within Florida's educational system.

The Sunshine State Standards are organized as follows:

> **Strand** = label (word or short phrase) for a category of knowledge, such as reading, writing, measurement, economics, nature of matter.
>
> > **Standard** = general statement of expected learner achievement within the strand.
> >
> > > **Benchmark** = learner expectations (what a student should know and be able to do to achieve the standard) at the end of the developmental levels of grades PreK-2, 3-5, 6-8, 9-12.

A strand is the most general type of information. A **strand** is a short label for a category of knowledge under which standards are subsumed. This helps organize the vast amount of information to be learned in a subject area. Each of the strands contains one or more standards. A **standard** is a description of general expectations regarding knowledge and skill development within a strand. The most specific level of information is the **benchmark**. A benchmark is a statement of expectations about student knowledge and skill at the end of one of four developmental levels: grades PreK-2, 3-5, 6-8, and 9-12. Benchmarks translate the general standards into expectations at different levels of student development. Within a standard, one would expect high school students to be performing differently from primary students. The benchmarks describe these differing levels of expectations.

It is expected that several benchmarks might often be combined into a single teaching or assessment activity. The listing of separate benchmarks does not mean that students must demonstrate achievement of them one at a time.

Expectations of student knowledge and skills are described in the standards, but the standards are also written with some assumptions regarding student learning. Although the knowledge and skills stated at an earlier level of schooling might not be repeated in the benchmarks at later levels, they remain important and should be reinforced and even re-taught, if necessary. It is also assumed that in meeting the expectations described in these benchmarks, students are working with material that is appropriate with regard to their ages, developmental levels, and grade levels.

For easy reference, the table of standards and benchmarks uses an identification system that mirrors the structure of the standards' organization. Each strand, standard, and benchmark has been assigned a unique identification code. The first two letters of the code identify the subject area, (e.g., LA for language arts, MA for mathematics; SC for science; SS for social studies; HE for health education; PE for physical education; FL for foreign languages; and in the arts, MU for music, VA for visual arts, TH for theatre, and DA for dance). The third letter identifies the strand. The number in the fourth slot identifies the general standard under the strand. The number in the fifth position identifies the developmental level, as in 1 = grades PreK-2, 2 = grades 3-5, 3 = grades 6-8, and 4 = grades 9-12. The last digit numbers the benchmarks under the grade cluster within the standard.

The Sunshine State Standards identify the essential knowledge and skills that students should learn and for which the state will hold schools accountable. Nevertheless, how the standards and benchmarks are organized within a specific curriculum, how they are taught within learning activities, what instructional strategies and materials are used to teach them, how much time is spent teaching them, and when they are taught within the developmental levels are local decisions.

A. Number Sense, Concepts, and Operations

1. The student understands the different ways numbers are represented and used in the real world.

Level	Benchmark **The student**
Grades PreK-2	MA.A.1.1.1 associates verbal names, written word names, and standard numerals with the whole numbers less than 1000.
	MA.A.1.1.2 understands the relative size of whole numbers between 0 and 1000.
	MA.A.1.1.3 uses objects to represent whole numbers or commonly used fractions and relates these numbers to real-world situations.
	MA.A.1.1.4 understands that whole numbers can be represented in a variety of equivalent forms.
Grades 3-5	MA.A.1.2.1 names whole numbers combining 3-digit numeration (hundreds, tens, ones) and the use of number periods, such as ones, thousands, and millions and associates verbal names, written word names, and standard numerals with whole numbers, commonly used fractions, decimals, and percents.
	MA.A.1.2.2 understands the relative size of whole numbers, commonly used fractions, decimals, and percents.
	MA.A.1.2.3 understands concrete and symbolic representations of whole numbers, fractions, decimals, and percents in real-world situations.
	MA.A.1.2.4 understands that numbers can be represented in a variety of equivalent forms using whole numbers, decimals, fractions, and percents.
Grades 6-8	MA.A.1.3.1 associates verbal names, written word names, and standard numerals with integers, fractions, decimals; numbers expressed as percents; numbers with exponents; numbers in scientific notation; radicals; absolute value; and ratios.
	MA.A.1.3.2 understands the relative size of integers, fractions, and decimals; numbers expressed as percents; numbers with exponents; numbers in scientific notation; radicals; absolute value; and ratios.

A. Number Sense, Concepts, and Operations

1. The student understands the different ways numbers are represented and used in the real world.	
Level	**Benchmark** **The student**
Grades 6-8	MA.A.1.3.3 understands concrete and symbolic representations of rational numbers and irrational numbers in real-world situations.
	MA.A.1.3.4 understands that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, and absolute value.
Grades 9-12	MA.A.1.4.1 associates verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, and complex numbers.
	MA.A.1.4.2 understands the relative size of integers, rational numbers, irrational numbers, and real numbers.
	MA.A.1.4.3 understands concrete and symbolic representations of real and complex numbers in real-world situations.
	MA.A.1.4.4 understands that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, and logarithms.

A. Number Sense, Concepts, and Operations

2. The student understands number systems.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.A.2.1.1 understands and applies the concepts of counting (by 2s, 3s, 5s, 10s, 25s, 50s), grouping, and place value with whole numbers between 0 and 100.
	MA.A.2.1.2 uses number patterns and the relationships among counting, grouping, and place value strategies to demonstrate an understanding of the whole number system.
Grades 3-5	MA.A.2.2.1 uses place-value concepts of grouping based upon powers of ten (thousandths, hundredths, tenths, ones, tens, hundreds, thousands) within the decimal number system.
	MA.A.2.2.2 recognizes and compares the decimal number system to the structure of other number systems such as the Roman numeral system or bases other than ten.
Grades 6-8	MA.A.2.3.1 understands and uses exponential and scientific notation.
	MA.A.2.3.2 understands the structure of number systems other than the decimal number system.
Grades 9-12	MA.A.2.4.1 understands and uses the basic concepts of limits and infinity.
	MA.A.2.4.2 understands and uses the real number system.
	MA.A.2.4.3 understands the structure of the complex number system.

A. Number Sense, Concepts, and Operations

3. The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.A.3.1.1 understands and explains the effects of addition and subtraction on whole numbers, including the inverse (opposite) relationship of the two operations.
	MA.A.3.1.2 selects the appropriate operation to solve specific problems involving addition and subtraction of whole numbers.
	MA.A.3.1.3 adds and subtracts whole numbers to solve real-world problems using appropriate methods of computing, such as objects, mental mathematics, paper and pencil, calculator.
Grades 3-5	MA.A.3.2.1 understands and explains the effects of addition, subtraction, and multiplication on whole numbers, decimals, and fractions, including mixed numbers, and the effects of division on whole numbers, including the inverse relationship of multiplication and division.
	MA.A.3.2.2 selects the appropriate operation to solve specific problems involving addition, subtraction, and multiplication of whole numbers, decimals, and fractions, and division of whole numbers.
	MA.A.3.2.3 adds, subtracts, and multiplies whole numbers, decimals, and fractions, including mixed numbers, and divides whole numbers to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

A. Number Sense, Concepts, and Operations

3. The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.	
Level	**Benchmark** **The student**
Grades 6-8	MA.A.3.3.1 understands and explains the effects of addition, subtraction, multiplication, and division on whole numbers, fractions, including mixed numbers, and decimals, including the inverse relationships of positive and negative numbers.
	MA.A.3.3.2 selects the appropriate operation to solve problems involving addition, subtraction, multiplication, and division of rational numbers, ratios, proportions, and percents, including the appropriate application of the algebraic order of operations.
	MA.A.3.3.3 adds, subtracts, multiplies, and divides whole numbers, decimals, and fractions, including mixed numbers, to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.
Grades 9-12	MA.A.3.4.1 understands and explains the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.
	MA.A.3.4.2 selects and justifies alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.
	MA.A.3.4.3 adds, subtracts, multiplies, and divides real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

A. Number Sense, Concepts, and Operations

4. The student uses estimation in problem solving and computation.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.A.4.1.1 provides and justifies estimates for real-world quantities.
Grades 3-5	MA.A.4.2.1 uses and justifies different estimation strategies in a real-world problem situation and determines the reasonableness of results of calculations in a given problem situation.
Grades 6-8	MA.A.4.3.1 uses estimation strategies to predict results and to check the reasonableness of results.
Grades 9-12	MA.A.4.4.1 uses estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. The student understands and applies theories related to numbers.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.A.5.1.1 classifies and models numbers as even or odd.
Grades 3-5	MA.A.5.2.1 understands and applies basic number theory concepts, including primes, composites, factors, and multiples.
Grades 6-8	MA.A.5.3.1 uses concepts about numbers, including primes, factors, and multiples, to build number sequences.
Grades 9-12	MA.A.5.4.1 applies special number relationships such as sequences and series to real-world problems.

B. Measurement

1. The student measures quantities in the real world and uses the measures to solve problems.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.B.1.1.1 uses and describes basic measurement concepts including length, weight, digital and analog time, temperature, and capacity.
	MA.B.1.1.2 uses standard customary and metric (centimeter, inch) and nonstandard units, such as links or blocks, in measuring real quantities.
Grades 3-5	MA.B.1.2.1 uses concrete and graphic models to develop procedures for solving problems related to measurement including length, weight, time, temperature, perimeter, area, volume, and angle.
	MA.B.1.2.2 solves real-world problems involving length, weight, perimeter, area, capacity, volume, time, temperature, and angles.
Grades 6-8	MA.B.1.3.1 uses concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids and cylinders.
	MA.B.1.3.2 uses concrete and graphic models to derive formulas for finding rates, distance, time, and angle measures.
	MA.B.1.3.3 understands and describes how the change of a figure in such dimensions as length, width, height, or radius affects its other measurements such as perimeter, area, surface area, and volume.
	MA.B.1.3.4 constructs, interprets, and uses scale drawings such as those based on number lines and maps to solve real-world problems.

B. Measurement

1. The student measures quantities in the real world and uses the measures to solve problems.

Level	Benchmark **The student**
Grades 9-12	MA.B.1.4.1 uses concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.
	MA.B.1.4.2 uses concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc lengths.
	MA.B.1.4.3 relates the concepts of measurement to similarity and proportionality in real-world situations.

2. The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/customary).

Level	Benchmark **The student**
Grades PreK-2	MA.B.2.1.1 uses direct (measured) and indirect (not measured) comparisons to order objects according to some measurable characteristics (length, weight).
	MA.B.2.1.2 understands the need for a uniform unit of measure to communicate in real-world situations.
Grades 3-5	MA.B.2.2.1 uses direct (measured) and indirect (not measured) measures to calculate and compare measurable characteristics.
	MA.B.2.2.2 selects and uses appropriate standard and nonstandard units of measurement, according to type and size.
Grades 6-8	MA.B.2.3.1 uses direct (measured) and indirect (not measured) measures to compare a given characteristic in either metric or customary units.
	MA.B.2.3.2 solves problems involving units of measure and converts answers to a larger or smaller unit within either the metric or customary system.
Grades 9-12	MA.B.2.4.1 selects and uses direct (measured) or indirect (not measured) methods of measurement as appropriate.

B. Measurement

2. The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/customary).	
Level	**Benchmark** **The student**
	MA.B.2.4.2 solves real-world problems involving rated measures (miles per hour, feet per second).

3. The student estimates measurements in real-world problem situations.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.B.3.1.1 using a variety of strategies, estimates lengths, widths, time intervals, and money and compares them to actual measurements.
Grades 3-5	MA.B.3.2.1 solves real-world problems involving estimates of measurements, including length, time, weight, temperature, money, perimeter, area, and volume.
Grades 6-8	MA.B.3.3.1 solves real-world and mathematical problems involving estimates of measurements including length, time, weight/mass, temperature, money, perimeter, area, and volume, in either customary or metric units.
Grades 9-12	MA.B.3.4.1 solves real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume, and estimates the effects of measurement errors on calculations.

B. Measurement

4. The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.B.4.1.1 selects and uses an object to serve as a unit of measure, such as a paper clip, eraser, or marble.
	MA.B.4.1.2 selects and uses appropriate instruments, such as scales, rulers, clocks, and technology to measure within customary or metric systems.
Grades 3-5	MA.B.4.2.1 determines which units of measurement, such as seconds, square inches, dollars per tankful, to use with answers to real-world problems.
	MA.B.4.2.2 selects and uses appropriate instruments and technology, including scales, rulers, thermometers, measuring cups, protractors, and gauges, to measure in real-world situations.
Grades 6-8	MA.B.4.3.1 selects appropriate units of measurement and determines and applies significant digits in a real-world context. (Significant digits should relate to both instrument precision and to the least precise unit of measurement.)
	MA.B.4.3.2 selects and uses appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.
Grades 9-12	MA.B.4.4.1 determines the level of accuracy and precision, including absolute and relative errors or tolerance, required in real-world measurement situations.
	MA.B.4.4.2 selects and uses appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.

D. Algebraic Thinking

1. The student describes, draws, identifies, and analyzes two- and three-dimensional shapes.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.C.1.1.1 understands and describes the characteristics of basic two- and three-dimensional shapes.
Grades 3-5	MA.C.1.2.1 given a verbal description, draws and/or models two- and three-dimensional shapes and uses appropriate geometric vocabulary to write a description of a figure or a picture composed of geometric figures.
Grades 6-8	MA.C.1.3.1 understands the basic properties of, and relationships pertaining to, regular and irregular geometric shapes in two and three dimensions.
Grades 9-12	MA.C.1.4.1 uses properties and relationships of geometric shapes to construct formal and informal proofs.

2. The student visualizes and illustrates ways in which shapes can be combined, subdivided, and changed.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.C.2.1.1 understands basic concepts of spatial relationships, symmetry, and reflections.
	MA.C.2.1.2 uses objects to perform geometric transformations, including flips, slides, and turns.
Grades 3-5	MA.C.2.2.1 understands the concepts of spatial relationships, symmetry, reflections, congruency, and similarity.
	MA.C.2.2.2 predicts**,** illustrates, and verifies which figures could result from a flip, slide, or turn of a given figure.
Grades 6-8	MA.C.2.3.1 understands the geometric concepts of symmetry, reflections, congruency, similarity, perpendicularity, parallelism, and transformations, including flips, slides, turns, and enlargements.
	MA.C.2.3.2 predicts and verifies patterns involving tessellations (a covering of a plane with congruent copies of the same pattern with no holes and no overlaps, like floor tiles).

D. Algebraic Thinking

2. The student visualizes and illustrates ways in which shapes can be combined, subdivided, and changed.

Level	Benchmark **The student**
Grades 9-12	MA.C.2.4.1 understands geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.
	MA.C.2.4.2 analyzes and applies geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).

3. The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.

Level	Benchmark **The student**
Grades PreK-2	MA.C.3.1.1 uses real-life experiences and physical materials to describe, classify, compare, and sort geometric figures, including squares, rectangles, triangles, circles, cubes, rectangular solids, spheres, pyramids, cylinders, and prisms, according to the number of faces, edges, bases, and corners.
	MA.C.3.1.2 plots and identifies positive whole numbers on a number line.
Grades 3-5	MA.C.3.2.1 represents and applies a variety of strategies and geometric properties and formulas for two- and three-dimensional shapes to solve real-world and mathematical problems.
	MA.C.3.2.2 identifies and plots positive ordered pairs (whole numbers) in a rectangular coordinate system (graph).
Grades 6-8	MA.C.3.3.1 represents and applies geometric properties and relationships to solve real-world and mathematical problems.
	MA.C.3.3.2 identifies and plots ordered pairs in all four quadrants of a rectangular coordinate system (graph) and applies simple properties of lines.
Grades 9-12	MA.C.3.4.1 represents and applies geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.
	MA.C.3.4.2 using a rectangular coordinate system (graph), applies and algebraically verifies

D. Algebraic Thinking

3. The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.	
Level	**Benchmark** **The student**
	properties of two- and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

1. The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.D.1.1.1 describes a wide variety of classification schemes and patterns related to physical characteristics and sensory attributes, such as rhythm, sound, shapes, colors, numbers, similar objects, similar events.
	MA.D.1.1.2 recognizes, extends, generalizes, and creates a wide variety of patterns and relationships using symbols and objects.
Grades 3-5	MA.D.1.2.1 describes a wide variety of patterns and relationships through models, such as manipulatives, tables, graphs, rules using algebraic symbols.
	MA.D.1.2.2 generalizes a pattern, relation, or function to explain how a change in one quantity results in a change in another.
Grades 6-8	MA.D.1.3.1 describes a wide variety of patterns, relationships, and functions through models, such as manipulatives, tables, graphs, expressions, equations, and inequalities.
	MA.D.1.3.2 creates and interprets tables, graphs, equations, and verbal descriptions to explain cause-and-effect relationships.
Grades 9-12	MA.D.1.4.1 describes, analyzes, and generalizes relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
	MA.D.1.4.2 determines the impact when changing parameters of given functions.

D. Algebraic Thinking

2. The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.D.2.1.1 understands that geometric symbols (○,□, Δ) can be used to represent unknown quantities in expressions, equations, and inequalities.
	MA.D.2.1.2 uses informal methods to solve real world problems requiring simple equations that contain one variable.
Grades 3-5	MA.D.2.2.1 represents a given simple problem situation using diagrams, models, and symbolic expressions translated from verbal phrases, or verbal phrases translated from symbolic expressions, etc.
	MA.D.2.2.2 uses informal methods, such as physical models and graphs to solve real-world problems involving equations and inequalities.
Grades 6-8	MA.D.2.3.1 represents and solves real-world problems graphically, with algebraic expressions, equations, and inequalities.
	MA.D.2.3.2 uses algebraic problem-solving strategies to solve real-world problems involving linear equations and inequalities.
Grades 9-12	MA.D.2.4.1 represents real-world problem situations using finite graphs, matrices, sequences, series, and recursive relations.
	MA.D.2.4.2 uses systems of equations and inequalities to solve real-world problems graphically, algebraically, and with matrices.

E. Data Analysis and Probability

1. The student understands and uses the tools of data analysis for managing information.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.E.1.1.1 displays solutions to problems by generating, collecting, organizing, and analyzing data using simple graphs and charts.
	MA.E.1.1.2 displays data in a simple model to use the concepts of range, median, and mode.
	MA.E.1.1.3 analyzes real-world data by surveying a sample space and predicting the generalization onto a larger population through the use of appropriate technology, including calculators and computers.
Grades 3-5	MA.E.1.2.1 solves problems by generating, collecting, organizing, displaying, and analyzing data using histograms, bar graphs, circle graphs, line graphs, pictographs, and charts.
	MA.E.1.2.2 determines range, mean, median, and mode from sets of data.
	MA.E.1.2.3 analyzes real-world data to recognize patterns and relationships of the measures of central tendency using tables, charts, histograms, bar graphs, line graphs, pictographs, and circle graphs generated by appropriate technology, including calculators and computers.
Grades 6-8	MA.E.1.3.1 collects, organizes, and displays data in a variety of forms, including tables, line graphs, charts, bar graphs, to determine how different ways of presenting data can lead to different interpretations.
	MA.E.1.3.2 understands and applies the concepts of range and central tendency (mean, median, and mode).
	MA.E.1.3.3 analyzes real-world data by applying appropriate formulas for measures of central tendency and organizing data in a quality display, using appropriate technology, including calculators and computers.

E. Data Analysis and Probability

1. The student understands and uses the tools of data analysis for managing information.	
Level	**Benchmark** **The student**
Grades 9-12	MA.E.1.4.1 interprets data that has been collected, organized, and displayed in charts, tables, and plots.
	MA.E.1.4.2 calculates measures of central tendency (mean, median, and mode) and dispersion (range, standard deviation, and variance) for complex sets of data and determines the most meaningful measure to describe the data.
	MA.E.1.4.3 analyzes real-world data and makes predictions of larger populations by applying formulas to calculate measures of central tendency and dispersion using the sample population data, and using appropriate technology, including calculators and computers.

2. The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.E.2.1.1 understands basic concepts of chance and probability.
	MA.E.2.1.2 predicts which simple event is more likely, equally likely, or less likely to occur.
Grades 3-5	MA.E.2.2.1 uses models, such as tree diagrams, to display possible outcomes and to predict events.
	MA.E.2.2.2 predicts the likelihood of simple events occurring.
Grades 6-8	MA.E.2.3.1 compares experimental results with mathematical expectations of probabilities.
	MA.E.2.3.2 determines odds for and odds against a given situation.
Grades 9-12	MA.E.2.4.1 determines probabilities using counting procedures, tables, tree diagrams, and formulas for permutations and combinations.
	MA.E.2.4.2 determines the probability for simple and compound events as well as independent and dependent events.

E. Data Analysis and Probability

3. The student uses statistical methods to make inferences and valid arguments about real-world situations.	
Level	**Benchmark** **The student**
Grades PreK-2	MA.E.3.1.1 designs a simple experiment to answer a class question, collects appropriate information, and interprets the results using graphical displays of information, such as line graphs, pictographs, and charts.
	MA.E.3.1.2 decides what information is appropriate and how data can be collected, displayed, and interpreted to answer relevant questions.
Grades 3-5	MA.E.3.2.1 designs experiments to answer class or personal questions, collects information, and interprets the results using statistics (range, mean, median, and mode) and pictographs, charts, bar graphs, circle graphs, and line graphs.
	MA.E.3.2.2 uses statistical data about life situations to make predictions and justifies reasoning.
Grades 6-8	MA.E.3.3.1 formulates hypotheses, designs experiments, collects and interprets data, and evaluates hypotheses by making inferences and drawing conclusions based on statistics (range, mean, median, and mode) and tables, graphs, and charts.
	MA.E.3.3.2 identifies the common uses and misuses of probability and statistical analysis in the everyday world.
Grades 9-12	MA.E.3.4.1 designs and performs real-world statistical experiments that involve more than one variable, then analyzes results and reports findings.
	MA.E.3.4.2 explains the limitations of using statistical techniques and data in making inferences and valid arguments.

Florida Course Descriptions For Mathematics 9-12

- Mathematics: 9-12
- Life Skills Mathematics: 9-12
- Intensive Mathematics
- Explorations in Mathematics I
- Explorations in Mathematics II
- Business Mathematics
- Consumer Mathematics
- Integrated Mathematics I, II, and III (series only)
- Applied Mathematics I and II (series) OR I, II, III (series)
- Pre-Algebra
- Algebra I
- Algebra I Honors
- Algebra Ia and Ib (one text or two-text series)
- Algebra II
- Algebra II Honors
- Geometry
- Geometry Honors
- Informal Geometry
- Liberal Arts Mathematics
- Trigonometry
- Analytic Geometry
- Pre-Calculus
- Mathematical Analysis
- Analysis of Functions
- Calculus
- Advanced Placement Calculus AB
- Advanced Placement Calculus BC
- Advanced Placement Statistics
- Probability and Statistics with Applications

Florida
COURSE DESCRIPTION – Advanced Placement Statistics

Subject Area: Mathematics
Course Number: 1210320
Course Title: Advanced Placement Statistics
Credit: 1.0
Will meet graduation requirements for Mathematics

A. Major Concepts/Content: The content should include, but not be limited to, the following:

- Exploratory data: observing patterns and departures from patterns
- Planning a study: deciding what and how to measure
- Anticipating patterns in advance: producing models using probability and simulation
- Statistical inference: confirming models

B. Special Note: Credit in this course precludes credit in Probability and Statistics with Application and Using Probability and Statistics.

C. Course Requirements: After successfully completing this course, the student will:

1. Interpret graphical displays of distributions of univariate data.
2. Summarize distributions of univariate data.
3. Compare distributions of univariate data.
4. Explore bivariate data.
5. Explore categorical data.
6. Overview methods of data collection.
7. Plan and conduct surveys.
8. Plan and conduct experiments.
9. Producing models using probability as relative frequency.
10. Combine independent random variables.

11. Simulate normal distribution.

12. Simulate sampling distributions.

13. Use confidence intervals to confirm models.

14. Use tests of significance to confirm models.

15. Explore special case of normally distributed data.

Florida

COURSE DESCRIPTION – Algebra I

Subject Area: Mathematics

Course Number: 1200310

Course Title: Algebra I

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop the algebraic concepts and processes that can be used to solve a variety of real-world and mathematical problems.

The content should include, but not be limited to, the following:

- structure and properties of the real number system, including rational and irrational numbers
- exponents, square roots, radicals, absolute value, and scientific notation
- varied means for analyzing and expressing patterns, relations, and functions, including words, tables, sequences, graphs, and algebraic equations
- variables, algebraic expressions, polynomials, and operations with polynomials
- coordinate geometry and graphing of equations and inequalities
- data analysis concepts and techniques including introductory statistics and probability
- varied solution strategies, algebraic and graphic, for inequalities, linear and quadratic equations, and for systems of equations

Algebra I

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. Special Note. The following courses or series of courses satisfy the Algebra I graduation requirement:

1. Algebra I
2. Algebra I Honors
3. Algebra Ia and Algebra Ib
4. Applied Mathematics I and Applied Mathematics II
5. Integrated Mathematics I and Integrated Mathematics II

Students may receive credit for only one of the courses or series of courses listed above.

C. Course Requirements. These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real and complex numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

2. Demonstrate understanding of number systems.

Algebra I

MA.A.2.4.1 understand *and use* the basic concepts of limits and infinity.

MA.A.2.4.2 understand and use the real number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. Demonstrate understanding and apply theories related to numbers.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

6. Measure quantities in the real world and use the measures to solve problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

Algebra I

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths.*

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/customary).

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

8. Estimate measurements in real-world problem situations.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

9. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency,* congruency, similarity, reflections, symmetry, *and transformations including flips, slides, turns, enlargements, rotations, and fractals.*

10. Use coordinate geometry to locate objects in two dimensions and to describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry.*

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three-* dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

Algebra I

11. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

12. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, *series, and recursive relations.*

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, *and with matrices.*

13. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation and variance*) for complex sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

14. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams *and formulas for permutations and combinations.*

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

Algebra I

15. Use statistical methods to make inferences and valid arguments about real-world situations.

MA.E.3.4.1 design and perform real-world statistical experiments that involve more than one variable, then analyze results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

Florida

COURSE DESCRIPTION – Algebra I a

Subject Area: Mathematics

Course Number: 1200370

Course Title: Algebra I a

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop the algebraic concepts and processes that can be used to solve a variety of real world and mathematical problems. **This is the first of a two year sequence of courses, Algebra Ia and Algebra Ib. Together, the two courses have the same requirements as Algebra I, Course Number 1200310.**

The content should include, but not be limited to, the following:

- structure and properties of the real number system, with an emphasis on rational numbers
- variables and algebraic expressions
- varied means for analyzing and expressing patterns, relations, and functions, including words, tables, graphs, geometric formulas, and linear equations and inequalities
- solution strategies for simple linear equations and inequalities of one variable
- relations expressed by ratio, rates, and proportion
- coordinate geometry and graphing of linear equations and inequalities

- varied solution strategies, algebraic and graphic, for linear functions
- data analysis concepts and techniques appropriate to identify patterns and make predictions
- algebraic notation, selected from the following: exponents, square roots, radicals, absolute value, and scientific notation

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. **Special Note.** The following courses or series of courses satisfy the Algebra I graduation requirement:

1. Algebra I
2. Algebra I Honors
3. Algebra Ia and Algebra Ib
4. Applied Mathematics I and Applied Mathematics II
5. Integrated Mathematics I and Integrated Mathematics II

Students may receive credit for only one of the courses or series of courses listed above.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

(**Note:** To meet the needs of students and teachers, districts may place some Algebra Ia, Course Number 1200370, requirements in Algebra Ib, Course Number 1200380.)

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

Algebra Ia

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

2. Demonstrate understanding of number systems.

MA.A.2.4.2 understand and use the real number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

Algebra Ia

5. Measure quantities in the real world and use the measures to solve problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths.*

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

6. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/customary).

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

7. Estimate measurements in real-world problem situations.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

8. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency*, congruency, similarity, *reflections*, symmetry, *and transformations including flips, slides, turns, enlargements, rotations, and fractals.*

Algebra Ia

9. Use coordinate geometry to locate objects in two dimensions and to describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry***.**

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three*-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

10. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

11. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, *matrices, sequences, series, and recursive relations.***

MA.D.2.4.2 use *systems of* equations and inequalities to solve real-world problems graphically, algebraically, *and with matrices***.**

12. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data**.**

Algebra Ia

13. Use statistical methods to make inferences and valid arguments about real-world situations.

MA.E.3.4.1 design and perform real-world statistical experiments *that involve more than one variable*, then analyze results and report findings.

Florida

COURSE DESCRIPTION – Algebra I b

Subject Area: Mathematics

Course Number: 1200380

Course Title: Algebra I b

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop the algebraic concepts and processes that can be used to solve a variety of real world and mathematical problems. This is the second of a two year sequence of courses, Algebra Ia and Algebra Ib. Together, the two courses have the same requirements as Algebra I, Course Number 1200310.

The content should include, but not be limited to, the following:

- structure and properties of the real number system, including rational and irrational numbers
- algebraic notation including exponents, square roots, radicals, absolute value, and scientific notation
- varied means for analyzing and expressing patterns, relations, and functions, including words, tables, graphs, sequences, linear and quadratic equations, and inequalities
- polynomials and operations with polynomials

Algebra Ib

- coordinate geometry and graphing of linear and quadratic functions and inequalities
- data analysis concepts and techniques including introductory statistics and probability
- varied solution strategies, algebraic and graphic, for linear and quadratic equations and for systems of equations

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. **Special Note.** The following courses or series of courses satisfy the Algebra I graduation requirement:

1. Algebra I
2. Algebra I Honors
3. Algebra Ia and Algebra Ib
4. Applied Mathematics I and Applied Mathematics II
5. Integrated Mathematics I and Integrated Mathematics II

Students may receive credit for only one of the courses or series of courses listed above.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

(**Note:** To meet the needs of students and teachers, districts may place some Algebra Ib, Course Number 1200380, requirements in Algebra Ia, Course Number 1200370.)

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

2. Demonstrate understanding of number systems.

MA.A.2.4.1 understand *and use* the basic concepts of limits and infinity.

MA.A.2.4.2 understand and use the real number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. Demonstrate understanding and apply theories related to numbers.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

6. Estimate measurements in real-world problem situations.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

7. Use coordinate geometry to locate objects in two dimensions and to describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry***.**

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three-* dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

8. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

9. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, *series, and recursive relations***.**

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, *and with matrices***.**

Algebra Ib

10. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data**.**

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

11. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams *and formulas for permutations and combinations.***

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

12. Use statistical methods to make inferences and valid arguments about real-world situations.

MA.E.3.4.1 design and perform real-world statistical experiments that involve more than one variable, then analyze results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

Florida

COURSE DESCRIPTION – Algebra II

Subject Area: Mathematics

Course Number: 1200330

Course Title: Algebra II

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to continue the study of algebra and to provide the foundation for applying algebraic skills to other mathematical and scientific fields.

The content should include, but not be limited to, the following:

- structure and properties of the complex number system
- arithmetic and geometric sequences and series
- relations, functions and graphs extended to polynomial, exponential, and logarithmic functions
- varied solution strategies for linear equations, inequalities, and systems of equations and inequalities
- varied solutions strategies, including the quadratic formula, for quadratic equations
- conic sections and their applications
- data analysis, including measures of central tendency and dispersion
- probability, permutations, and combinations

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

B. **Special Note.** Students earning credit in Algebra II may not earn credit in Algebra II Honors.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, and complex numbers.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real and complex numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, and logarithms.

2. Demonstrate understanding of number systems.

MA.A.2.4.1 understand *and use* the basic concepts of limits and infinity.

MA.A.2.4.2 understand and use the real number system.

MA.A.2.4.3 understand the structure of the complex number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. Demonstrate understanding and apply theories related to numbers.

MA.A.5.4.1 apply special number relationships such as sequences and series to real-world problems.

6. Measure quantities in the real world and use the measures to solve problems.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc length.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/customary).

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

Algebra II

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

8. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations and fractals.

MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).

9. Use coordinate geometry to locate objects in two and three dimensions and to describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

10. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

11. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, series and recursive relations.

Algebra II

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, and with matrices**.**

12. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

13. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams and formulas for permutations and combinations.

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

Florida

COURSE DESCRIPTION – Algebra II Honors

Subject Area: Mathematics

Course Number: 1200340

Course Title: Algebra II Honors

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to continue the study of algebra and to provide the foundation for applying algebraic skills to other mathematical and scientific fields.

The content should include, but not be limited to, the following:

- structure and properties of the complex number system
- arithmetic and geometric sequences and series
- relations, functions and graphs extended to polynomial, exponential, and logarithmic functions
- varied solution strategies for linear equations, inequalities, and systems of equations and inequalities
- varied solutions strategies, including the quadratic formula, for quadratic equations
- conic sections and their applications
- data analysis, including measures of central tendency and dispersion
- probability, permutations, and combinations

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

B. **Special Note.** Students earning credit in Algebra II may not earn credit in Algebra II Honors.

The course requirements for this honors course are consistent with Algebra II, Course Number 1200330. The district shall develop a description of additional requirements to provide for in-depth or enriched study of the course requirements.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, and complex numbers.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real and complex numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, and logarithms.

2. Demonstrate understanding of number systems.

MA.A.2.4.1 understand *and use* the basic concepts of limits and infinity.

MA.A.2.4.2 understand and use the real number system.

MA.A.2.4.3 understand the structure of the complex number system.

Algebra II Honors

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results**.**

5. Demonstrate understanding and apply theories related to numbers.

MA.A.5.4.1 apply special number relationships such as sequences and series to real-world problems.

6. Measure quantities in the real world and use the measures to solve problems.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc length.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/customary).

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

8. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).

9. Use coordinate geometry to locate objects in two and three dimensions and to describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

10. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

11. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, series, and recursive relations.

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, and with matrices.

12. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

13. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams and formulas for permutations and combinations.

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

Florida

COURSE DESCRIPTION – Algebra I Honors

Subject Area: Mathematics

Course Number: 1200320

Course Title: Algebra I Honors

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop the algebraic concepts and processes that can be used to solve a variety of real-world and mathematical problems.

The content should include, but not be limited to, the following:

- structure and properties of the real number system, including rational and irrational numbers
- exponents, square roots, radicals, absolute value, and scientific notation
- varied means for analyzing and expressing patterns, relations, and functions, including tables, sequences, graphing, and algebraic equations
- variables, algebraic expressions, polynomials, and operations with polynomials
- coordinate geometry and graphing of equations and inequalities
- data analysis concepts and techniques including introductory statistics and probability
- varied solution strategies, algebraic and graphic, for inequalities, linear and quadratic equations, and for systems of equations

Algebra I Honors

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. **Special Note.** The following courses or series of courses satisfy the Algebra I graduation requirement:

1. Algebra I
2. Algebra I Honors
3. Algebra Ia and Algebra Ib
4. Applied Mathematics I and Applied Mathematics II
5. Integrated Mathematics I and Integrated Mathematics II

Students may receive credit for only one of the courses or series of courses listed above.

The course requirements for this honors course are consistent with Algebra I, Course Number 1200310. The district shall develop a description of additional requirements to provide for in-depth or enriched study of the course requirements.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

2. Demonstrate understanding of number systems.

MA.A.2.4.1 understand *and use* the basic concepts of limits and infinity.

MA.A.2.4.2 understand and use the real number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. Demonstrate understanding of and apply theories related to numbers.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

6. Measure quantities in the real world and use the measures to solve problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths.*

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/customary).

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

8. Estimate measurements in real-world problem situations.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

9. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency,* congruency, similarity, reflections, symmetry, *and transformations including flips, slides, turns, enlargements, rotations, and fractals.*

10. Use coordinate geometry to locate objects in two dimensions and to describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry***.**

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three*-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

11. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

12. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, *series, and recursive relations***.**

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, *and with matrices***.**

13. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation and variance*) for complex sets of data and determine the most meaningful measure to describe the data**.**

Algebra I Honors

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

14. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams *and formulas for permutations and combinations.*

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

15. Use statistical methods to make inferences and valid arguments about real-world situations.

MA.E.3.4.1 design and perform real-world statistical experiments that involve more than one variable, then analyze results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

Florida Department of Education

COURSE DESCRIPTION – Analysis of Functions

Subject Area: Mathematics
Course Number: 1201310
Course Title: Analysis of Functions
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education: all students will have access to calculators and computers; classroom activities will be student-centered; all courses will have increased emphasis on estimation; and evaluation will include alternative methods of assessment.

A. **Major concepts/content.** The purpose of this course is to study mathematics using functions as a unifying theme. Content shall include but not be limited to polynomial and rational functions, statistical and probability functions, exponential and logarithmic functions, and trigonometric and circular functions.

B. **Special note.** This course is designed to follow Algebra II or Algebra II Honors. A credit in this course precludes a credit in Trigonometry or Trigonometry IC.

C. **Course Requirements.** After successfully completing this course, the student will:

1. Evaluate, graph, and apply polynomial functions.
2. Evaluate, graph, and apply rational functions.
3. Demonstrate knowledge of statistical measures, distributions, and graphs.
4. Demonstrate knowledge of probability measures and distributions.
5. Demonstrate knowledge of exponential functions.
6. Demonstrate knowledge of logarithmic functions.
7. Evaluate, graph, and apply trigonometric and circular functions.

Florida

COURSE DESCRIPTION – Analytic Geometry

Subject Area: Mathematics

Course Number: 1206330

Course Title: Analytic Geometry

Credit**:** .5

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop an understanding of the relationship between algebra, geometry, and trigonometry.

The content will include, but not be limited to, the following:

- linear equations
- graphs and curve sketching
- Cartesian and polar coordinate systems
- analytic proofs
- vectors
- conic sections, including transformations of axes
- equations and graphs in polar form
- parametric equations
- applications to real-world problem solving

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the subject matter.

B. **Special Note.** Students earning credit in Pre-Calculus may not earn credit in both Trigonometry and Analytic Geometry.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. Some requirements in this advanced mathematics course are not addressed in the Sunshine State Standards, and some of the cited benchmarks are prerequisite to the course requirement.

After successfully completing this course, the student will:

1. Demonstrate the ability to determine distances within the Cartesian coordinate system.

MA.B.1.4.2	use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc lengths.
MA.B.2.4.1	select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.
MA.C.2.4.2	analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).
MA.C.3.4.2	using a rectangular coordinate system (graph), apply and algebraically verify properties of two- and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.
MA.D.1.4.1	describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
MA.D.1.4.2	determine the impact when changing parameters of given functions.

Analytic Geometry

2. Demonstrate the ability to solve systems of equations.

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, and with matrices.

3. Demonstrate an understanding of polynomial and rational functions, their parametric equations, and their graphs.

M.A.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

4. Demonstrate an understanding of conic sections and other loci.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

5. Demonstrate an understanding of the polar coordinate system and its relationship to the Cartesian coordinate system.

6. Demonstrate the ability to solve problems using vectors.

Analytic Geometry

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

7. Demonstrate the ability to verify a conclusion by applying the properties of analytic geometry.

M.A.C.1.4.1 use properties and relationships of geometric shapes to construct formal and informal proofs.

M.A.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two-and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

M.A.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

Florida
COURSE DESCRIPTION – Advanced Placement Calculus AB

Course Number: 1202310
Course Title: Advanced Placement Calculus AB
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education: all students will have access to calculators and computers; classroom activities will be student-centered; all courses will have increased emphasis on estimation; and evaluation will include alternative methods of assessment.

A. **Major concepts/content:** The purpose of this course is to study algebraic and transcendental functions and the general theory and techniques of calculus.

The content should include, but not be limited to, the following:

- the content specified by the Advanced Placement Program.

B. **Special note.** None

C. **Course Requirements.** After successfully completing this course, the student will be able to:

1. Identify and apply properties of algebraic, trigonometric, exponential, and logarithmic functions.

2. Apply the concept of limits to functions.

3. Determine derivatives of algebraic, trigonometric, exponential, and logarithmic functions.

4. Determine derivatives of the inverse of a function.

5. Determine the relation between differentiability and continuity.

6. Demonstrate an understanding of the application of the derivative to problem situations.

7. Identify increasing and decreasing functions, relative and absolute maximum and minimum points, concavity, and points of inflection.

8. Determine antiderivatives of algebraic, trigononmetric, exponential, and logarithmic functions.

9. Apply antiderivatives to solve problems.

10. Use the techniques of integration.

11. Determine approximations of definite integrals using rectangles or trapezoids.

12. Apply knowledge of integral calculus to find the area between curves and the volume of a solid of revolution.

Florida
COURSE DESCRIPTION – Advanced Placement Calculus BC

Subject Area: Mathematics
Course Number: 1202320
Course Title: Advanced Placement Calculus BC
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education: all students will have access to calculators and computers; classroom activities will be student-centered; all courses will have increased emphasis on estimation; and evaluation will include alternative methods of assessment.

A. **Major concepts/content:** The purpose of this course is to provide an extensive study of the general theory and techniques of calculus.

The content should include, but not be limited to, the following:

- the content specified by the Advanced Placement Program.

B. **Special note.** None

C. **Course Requirements.** After successfully completing this course, the student will be able to:

1. Identify and apply properties of algebraic, trigonometric, exponential, and logarithmic functions.
2. Apply the concept of limits to functions.
3. Determine derivatives of algebraic, trigonometric, exponential, and logarithmic functions.
4. Determine the derivatives of the inverse of a function.
5. Determine the relation between differentiability and continuity.
6. Demonstrate an understanding of the application of the derivative in problem situations.
7. Identify increasing and decreasing functions, relative and absolute maximum and minimum points, concavity, and points of inflection.

8. Determine antiderivatives of algebraic, trigonometric, exponential, and logarithmic functions.

9. Apply antiderivatives to solve problems.

10. Use the techniques of integration.

11. Determine approximations of definite integrals using rectangles or trapezoids.

12. Apply knowledge of integral calculus to find the area between curves, the volume of a solid of revolution, and other practical applications.

13. Apply the concepts involving sequences and series of real numbers and convergence.

14. Determine solutions to elementary differential equations.

Florida Course Description
Applied Mathematics III

Subject Area: Mathematics
Course Number: 1205420
Course Title: Applied Mathematics III
Credit: 1.0
Will meet graduation requirements for Mathematics

A. Major concepts/content. The purpose of this course is to strengthen the mathematical skills necessary for advanced training in postsecondary programs. The emphasis is on the ability of students to understand and apply functional mathematics to solve problems in the world of work.

The content should include, but not be limited to, the following

- factoring
- quadratics
- functions, relations, and graphs systems of equations and inequalities two-and three-dimensional geometry
- applying properties of geometry to problem solving analysis of production data to insure quality in manufacturing and design requirements
- applying properties of trigonometry to problem solving applying properties of statistics to problem solving

B. Special note. The overall course includes materials that focus on algebraic, geometric, and elementary trigonometric concepts and their work-related applications. The use of a computer with appropriate software and a graphing calculator is essential in this course. Laboratory activities are a necessary part of this course and their use is strongly recommended.

C. Course Requirements. After successfully completing this course, the student will:

1. Demonstrate an understanding of polynomials.

2. Use quadratic equations to solve problems.

3. Understand and apply functions, relations, and graphs.

4. Apply systems of equations and inequalities to solve problems.

5. Understand and apply geometric properties to solve problems.

6. Demonstrate an understanding of the structure of mathematics as it applies in the real world.

Florida

COURSE DESCRIPTION – Applied Mathematics I

Subject Area: Mathematics

Course Number: 1205400

Course Title: Applied Mathematics I

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to provide algebraic, geometric and statistical real-world experiences using hands-on laboratory activities, including those from occupational contexts. Student experiences will involve exploration of new concepts, development of understanding of core mathematical ideas, and creation of a foundation for a more formal study of mathematics.

The content shall include, but not be limited to, the following:

- structure and properties of the real number system
- variables and algebraic expressions
- varied means for analyzing and expressing patterns, relations, and functions, including words, tables, graphs, and linear equations and inequalities
- coordinate geometry and graphing of linear equations and inequalities
- varied solution strategies, algebraic and graphic, for linear equations and inequalities

- data analysis concepts and techniques appropriate to identify patterns and make predictions
- geometric constructions
- terminology and fundamental properties of geometry
- inductive reasoning and informal proof
- measurement of plane and solid figures, including perimeter, area, and volume
- exploration and application of geometric relationships including parallelism, perpendicularity, congruence, and similarity

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

B. **Special Note.** The following courses or series of courses satisfy the Algebra I graduation requirement:

1. Algebra I
2. Algebra I Honors
3. Algebra Ia and Algebra Ib
4. Applied Mathematics I and Applied Mathematics II
5. Integrated Mathematics I and Integrated Mathematics II

Students may receive credit for only one of the courses or series of courses listed above.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

Applied Mathematics I

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers.*

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, *exponents, radicals, absolute value, and logarithms*.

2. Demonstrate understanding of number systems.

MA.A.2.4.2 understand and use the real number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

Applied Mathematics I

5. Demonstrate understanding and apply theories related to numbers.

MA.A.5.4.1 apply special number relationships *such as sequences and series* to real-world problems.

6. Measure quantities in the real world and use the measures to solve problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, *cylinders, cones, and pyramids.*

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths*.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/customary).

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

8. Estimate measurements in real-world problem situations.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

9. Select and use appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.

MA.B.4.4.1 determine the level of accuracy and precision, *including absolute and relative errors or tolerance*, required in real-world measurement situations.

Applied Mathematics I

MA.B.4.4.2 select and use appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.

10. Describe, draw, identify, and analyze two- and three-dimensional shapes.

MA.C.1.4.1 use properties and relationships of geometric shapes to construct *formal and* informal proofs.

11. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency,* congruency, similarity, *reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.*

12. Use coordinate geometry to locate objects in two dimensions and describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry.*

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three-* dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

13. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

Applied Mathematics I

14. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, *sequences, series, and recursive relations*.

MA.D.2.4.2 use *systems of* equations and inequalities to solve real-world problems graphically, algebraically, *and with matrices*.

15. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

16. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams, *and formulas for permutations and combinations*.

MA.E.2.4.2 determine the probability for simple *and compound* events as well as independent *and dependent* events.

17. Use statistical methods to make inferences and valid arguments about real-world situations.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

Florida

COURSE DESCRIPTION – Applied Mathematics II

Subject Area: Mathematics

Course Number: 1205410

Course Title: Applied Mathematics II

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. **Major Concepts/Content.** The purpose of this course is to provide algebraic, geometric and statistical real-world experiences using hands-on laboratory activities, including those from occupational contexts. Student experiences will involve exploration of new concepts, development of understanding of core mathematical ideas, and creation of a foundation for a more formal study of mathematics.

The content shall include, but not be limited to, the following:

- structure and properties of the real number system
- exponents, square roots, radicals, absolute value, and scientific notation
- variables, algebraic expressions, polynomials, and operations with polynomials
- varied means for analyzing and expressing patterns, relations, and functions, including words, tables, graphs, sequences, algebraic equations, and inequalities
- coordinate geometry and graphing of inequalities, linear and quadratic equations

Applied Mathematics II

- varied solution strategies, algebraic and graphic, for inequalities and for linear and quadratic equations
- data analysis concepts and techniques including introductory statistics and probability
- geometric constructions
- terminology and fundamental properties of geometry
- inductive reasoning and informal proof
- introduction to deductive reasoning
- measurement of plane and solid figures, including perimeter, area, and volume
- exploration and application of geometric relationships including parallelism, perpendicularity, congruence, and similarity
- symmetry and transformational geometry

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

B. **Special Note.** The following courses or series of courses satisfy the Algebra I graduation requirement:

1. Algebra I
2. Algebra I Honors
3. Algebra Ia and Algebra Ib
4. Applied Mathematics I and Applied Mathematics II
5. Integrated Mathematics I and Integrated Mathematics II

Students may receive credit for only one of the courses or series of courses listed above.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

2. Demonstrate understanding of number systems.

MA.A.2.4.1 understand *and use* the basic concepts of limits and infinity.

MA.A.2.4.2 understand and use the real number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. Demonstrate understanding and apply theories related to numbers.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

6. Measure quantities in the real world and use the measures to solve problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths*.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/customary).

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

8. Estimate measurements in real-world problem situations.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

Applied Mathematics II

9. Select and use appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.

MA.B.4.4.1 determine the level of accuracy and precision*, including absolute and relative errors or tolerance*, required in real-world measurement situations.

MA.B.4.4.2 select and use appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.

10. Describe, draw, identify, and analyze two- and three-dimensional shapes.

MA.C.1.4.1 use properties and relationships of geometric shapes to construct *formal and* informal proofs.

11. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency*, congruency, similarity, reflections, symmetry, and transformations including flips, slides , turns, enlargements, rotations, *and fractals.*

12. Use coordinate geometry to locate objects in two dimensions and describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry*.

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three-* dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

13. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

Applied Mathematics II

14. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, *series, and recursive relations*.

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, *and with matrices*.

15. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by applying formulas to calculate measures of central tendency and dispersion using the sample population data and using appropriate technology, including calculators and computers.

16. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams, *and formulas for permutations and combinations*.

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

17. Use statistical methods to make inferences and valid arguments about real-world situations.

MA.E.3.4.1 design and perform real-world statistical experiments that involve more than one variable, then analyze the results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

Florida

COURSE DESCRIPTION – Business Mathematics

Subject Area: Mathematics

Course Number: 1205540

Course Title: Business Mathematics

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to enable students to develop mathematical competence in problem solving, communication, and reasoning, as related to the business world.

The content should include, but not be limited to, the following:

- wholesale and retail pricing
- banking services
- payroll
- marketing
- investments
- taxes
- accounting and bookkeeping
- statistics
- business records and financial reports
- insurance

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

B. Special Note. None

C. Course Requirements. These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Apply mathematical strategies to solutions for business-related problems.

MA.A.3.4.2	select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.
MA.A.3.4.3	add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.
MA.A.4.4.1	use estimation strategies in complex situations to predict results and to check the reasonableness of results.
MA.B.1.4.3	relate the concepts of measurement to similarity and proportionality in real-world situations.
MA.B.3.4.1	solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

2. Use a variety of formats to communicate mathematical aspects of business situations.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

3. Use mathematical reasoning and problem solving to collect and analyze data for decision making.

MA.B.4.4.1 determine the level of accuracy and precision, including absolute and relative errors or tolerance, required in real-world measurement situations.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, standard deviation, and variance) for complex sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations *by applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

Florida
COURSE DESCRIPTION - Calculus

Subject Area: Mathematics
Course Number: 1202300
Course Title: Calculus
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education: all students will have access to calculators and computers; classroom activities will be student-centered; all courses will have increased emphasis on estimation; and evaluation will include alternative methods of assessment.

A. **Major concepts/content.** The purpose of this course is to provide a foundation for the study of advanced mathematics.

The content should include, but not be limited to, the following:

- elementary functions
- limits and continuity
- derivatives
- differentiation
- applications of the derivative
- antiderivatives
- definite integral
- applications of the integral

B. **Special note.** None

C. **Course Requirements.** After successfully completing this course, the student will:

1. Demonstrate the ability to identify and apply properties of elementary functions.

2. Demonstrate the ability to apply the theory of limits and continuity.

3. Demonstrate the ability to apply the rules of differentiation to find derivatives of elementary functions.

4. Demonstrate the ability to apply the concepts of differentiation.

5. Demonstrate the ability to find the general antiderivative of an elementary function.

6. Demonstrate the ability to find the definite integral of an elementary function.

7. Demonstrate the ability to apply the concepts of integration.

Florida
COURSE DESCRIPTION
Mathematics Grades 9-12

Subject Area:	Academics: Subject Areas
Course Number:	7912050
Course Title:	Math: 9-12
Previous Course Title:	Applied Math: Comprehensive
Credit:	Multiple

A. Major Concepts/Content. The purpose of this course is to provide instruction in math concepts and procedures to enable students with disabilities who are functioning at independent levels to prepare to participate effectively in post-school adult living and in the world of work.

The content should include, but not be limited to, the following:

- number systems, including whole numbers, fractions, and decimals
- number operations and computation
- measurement concepts in length, weight, volume, time, and money
- geometric concepts
- algebraic concepts, including problem solving
- probability and data analysis
- use of calculators
- applications in personal life
- applications in the workplace

This course shall integrate the Sunshine State Standards and Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the individual student and to the content and processes of the subject matter. Students with disabilities shall:

CL.A.1.In.1 complete specified Sunshine State Standards with modifications as appropriate for the individual student.

B. **Special Note.** This entire course may not be mastered in one year. A student may earn multiple credits in this course. The particular course requirements that the student should master to earn each credit must be specified on an individual basis. Multiple credits may be earned sequentially or simultaneously.

This course is primarily designed for students functioning at independent levels who are generally capable of working and living independently and may need occasional assistance. Three levels of functioning, independent, supported, and participatory, have been designated to provide a way to differentiate benchmarks and course requirements for students with diverse abilities. Individual students may function at one level across all areas, or at several different levels, depending on the requirements of the situation.

This course may also be used to accommodate the range of abilities within the population of students with disabilities. The particular benchmark for a course requirement should be selected for individual students based on their levels of functioning and their desired post-school outcomes for adult living and employment specified in the Transition Individual Educational Plan.

The level of functioning should be determined for each course requirement or performance objective. The key to determining the level is consideration of the amount of additional support and assistance that *must* be provided for the student. This support and assistance must be *beyond* what is typically provided for nondisabled individuals in performing the same type of behaviors or tasks. The following guidelines may be used to assist this process.

- For requirements/objectives mastered at the Independent Level, students are expected to be able to perform the behaviors identified for each benchmark *on their own* once they have mastered the knowledge and skills.
- For requirements/objectives mastered at the Supported Level, mastery should be determined with consideration of the amount and type of *guidance and support* necessary to the student to perform the behavior. This generally consists of some type of prompting or supervision.

  Physical prompt—a touch, pointing, or other type of gesture as a reminder

  Verbal prompt—a sound, word, phrase, or sentence as a reminder

  Visual prompt—color coding, icons, symbols, or pictures as a reminder

  Assistive technology—an alarm, an electronic tool

  Supervision—from occasional inspection to continuous observation

- For requirements/objectives mastered at the Participatory Level, mastery should be determined with consideration of the amount and type of *assistance* necessary to the student to participate in the performance of the behavior.

  Physical assistance—from a person, such as full physical manipulation or partial movement assistance

  Assistive technology—full: props, bolsters, pads, electric wheelchair; partial: straps, lapboards, adapted utensils

The performance objectives are designed to provide teachers with ideas for short-term objectives for instructional planning. The performance objectives are not intended to be exhaustive of all the possible short-term objectives a student may need in this multiple credit course. Other objectives should be added as required by an individual student.

Instructional activities involving practical applications of course requirements may occur in naturalistic settings in home, school, and community for the purposes of practice, generalization, and maintenance of skills. These applications may require that the student acquire the knowledge and skills involved with the use of related technology, tools, and equipment.

C. Course Requirements. These requirements include, but are not limited to, the benchmarks from the Sunshine State Standards for Special Diploma that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate. Some requirements in this course are not fully addressed in the Sunshine State Standards for Special Diploma.

After successfully completing this course, the student will:

1. Demonstrate understanding of number concepts and systems, including whole numbers, fractions, and decimals.

CL.B.3.In.1 identify mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other:

Mathematics Grades 9-12

Numbers

1.1. Identify equal and unequal quantities to accomplish functional tasks (e.g., cutting a sandwich in half, sharing a plate of cookies, mixing water and vinegar for cleaning, dealing cards for a game). (CL.B.3.In.1, CL.B.3.Su.1)

1.2. *Distinguish between all, some, and none. (Mathematics A 1: III)*

1.3. *Demonstrate the use of one-to-one correspondence. (Mathematics B 7: III)*

1.4. Identify whole numbers to accomplish functional tasks (e.g., finding pages in a book, finding a street address, reading speed limit signs, reading temperature gauges, identifying the cost of a house, identifying bus numbers, giving account numbers). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ to 10 _____ ❑ to 100 _____ ❑ to 1000
_____ ❑ to 10,000 _____ ❑ to 100,000

1.5. *Match numerals to corresponding sets of objects, 0 to 10. (Mathematics B 9: IV)*

1.6. *Reproduce numerals from 0 to 10. (Mathematics B 10: IV)*

1.7. *Identify numerals which correspond to sets of objects 11 to 100. (Mathematics B 12: V)*

1.8. Count objects to accomplish functional tasks (e.g., home—counting silverware for setting the table, getting towels for guests; leisure—counting number of seconds to go in a basketball game; workplace—counting screws to assemble a product, identifying how many rooms to clean). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ to 10 _____ ❑ to 100 _____ ❑ to 1000

1.9. *Count from 1 to 5. (Mathematics B 8: III)*

1.10. Use skip counting to accomplish functional tasks (e.g., counting large numbers of objects, counting money, counting items in inventory, counting off individuals to form teams, identifying odd and even numbers, searching for a street number—all buildings on one side of the street have odd numbers). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ by 2s _____❑ by 5s _____❑ by 10s _____ ❑ by 100s

1.11. *Count by 2's, 5's, and 10's to 100. (Mathematics B 13: V)*

1.12. Identify the whole number that comes before, after, or between a given number(s) to accomplish functional tasks (e.g., locating the date after a holiday on a calendar,

searching for a book in the library according to number, filing charts by numerical order). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ to 10 _____ ❑ to 100 _____ ❑ to 1000
_____ ❑ to 10,000 _____ ❑ to 100,000

1.13. Compare numbers to accomplish functional tasks (e.g., placing numbered pages in the correct order, comparing prices, comparing rental rates for apartments, comparing scores in a game to determine the winning team). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ to 10 _____ ❑ to 100 _____ ❑ to 1000
_____ ❑ to 10,000 _____ ❑ to 100,000

1.14. *Identify one and one more. (Mathematics A 2: III)*

1.15. Identify objects in a series by ordinal position to accomplish functional tasks (e.g., identifying the third game in a playoff, identifying the second sentence in a paragraph, identifying the third frame in bowling, identifying the last pay period of the year). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ first, middle, last _____ ❑ to 5th
_____ ❑ to 10th _____ ❑ to 100th

1.16. *Identify the first and last member in a group of objects. (Mathematics A 3: III)*

1.17. *Demonstrate understanding the concept of middle. (Mathematics A 4: IV)*

1.18. Identify the meaning of numerals when completing functional tasks (e.g., reading a street sign). (CL.B.1.In.1, CL.B.1.Su.1)

1.19. Write numerals when completing functional tasks (e.g., making an inventory). (CL.B.2.In.1, CL.B.2.Su.1)

1.20. Identify the meaning of number words when completing functional tasks (e.g., reading a newspaper article, reading an amount on a check). (CL.B.1.In.1, CL.B.1.Su.1)

1.21. Identify the meaning of ordinal number words when completing functional tasks (e.g., identifying who is first in line, identifying what place a runner finished in a race, identifying when it is your turn). (CL.B.1.In.1, CL.B.1.Su.1)

1.22. *Read number words, zero to ten. (Mathematics B 11: V)*

1.23. *Read number words from eleven to one hundred. (Mathematics B 14: VI)*

Place Value

1.24. Use knowledge of place value for whole numbers and decimals to accomplish functional tasks (e.g., lining up whole numbers and decimals for solving computation problems, reading and writing large numbers correctly, identifying the meaning of a number on a digital gauge or clock). (CL.B.3.In.2, CL.B.3.Su.2)

Specify whole numbers: _____ ❑ 1s _____ ❑ 10s _____ ❑ 100s
_____ ❑ 1000s _____ ❑ 10,000s _____ ❑ 100,000s
Specify decimals: _____ ❑ tenths _____ ❑ hundredths _____ ❑ thousandths

1.25. Round whole numbers and decimals to accomplish functional tasks (e.g., estimating distance when traveling, estimating time left for an activity, estimating cost of purchases). (CL.B.3.In.2, CL.B.3.Su.2)

Specify whole numbers: _____ ❑ 1s _____ ❑ 10s _____ ❑ 100s
_____ ❑ 1000s _____ ❑ 10,000s _____ ❑ 100,000s
Specify decimals: _____ ❑ tenths _____ ❑ hundredths _____ ❑ thousandths

Fractions/Decimals/Percents

1.26. Identify the meaning of fractional parts of an object, area, or set of items to accomplish functional tasks (e.g., measuring 1/3 cup of milk, cutting a pie into eighths, cutting a piece of wood in half, determining what fraction of the students are girls). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ halves _____ ❑ thirds _____ ❑ fourths _____ ❑ fifths
_____ ❑ sixths _____ ❑ eighths _____ ❑ tenths _____ ❑ twelfths
_____ ❑ other: _____

1.27. *Identify halves and fourths of an area. (Mathematics J 74: V)*

1.28. Identify the meaning of mixed numbers with fractions to accomplish functional tasks (e.g., measuring the length of an object or area, identifying lapsed time). (CL.B.3.In.1, CL.B.3.Su.1)

1.29. Identify the decimal equivalent of a percent (e.g., 98% = .98, 32% = .32) to accomplish functional tasks (e.g., multiplying and dividing percentages to calculate discounts, finding the average of test grades, determining 15% gratuity on a bill). (CL.B.3.In.1, CL.B.3.Su.1)

1.30. Identify the decimal equivalent of a fraction to accomplish functional tasks (e.g., determining discounts—half off, calculating savings at a sale). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ 1/2 = 50% _____ ❑ 1/4 = 25% _____ ❑ 3/4 = 75%
_____ ❑ 1/3 = 33% _____ ❑ 2/3 = 67% _____ ❑ other: _____

1.31. *Identify simple fraction and percent equivalents (e.g., 1/2 = 50%, 1/4 = 25%). (Mathematics J 75: VI)*

1.32. Identify the meaning of numerals with decimals and percents when completing functional tasks (e.g., reading a sale sign, reading a digital clock). (CL.B.1.In.1, CL.B.1.Su.1)

1.33. Write numerals with decimals and percents when completing functional tasks (e.g., listing the cost of items). (CL.B.1.In.2, CL.B.1.Su.2)

1.34. Identify the meaning of numerals with fractions when completing functional tasks (e.g., reading a recipe). (CL.B.1.In.1, CL.B.1.Su.1)

1.35. Write numerals with fractions when completing functional tasks (e.g., writing a recipe). (CL.B.2.In.1, CL.B.2.Su.1)

2. Use estimation in problem solving and computation.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other:
_____

2.1. Estimate the number of objects in a set and compare the estimate with the actual number to accomplish functional tasks (e.g., dishes needed for a dinner party, pencils to distribute to a class, baseballs in a bag to play a game). (CL.B.3.In.2, CL.B.3.Su.2)

2.2. Estimate, by first rounding numbers, the solution to computation problems to accomplish functional tasks (e.g., rounding prices to obtain a subtotal before purchasing, estimating how much money is needed to fill a gas tank, estimating the average rate of automobile speed). (CL.B.3.In.2, CL.B.3.Su.2)

2.3. Estimate the length, width, or height of an object or area to accomplish functional tasks (e.g., estimating the width of a box to see if it can fit through a door, estimating the height of a chair for a desk, estimating the width and length of a frame for a picture). (CL.B.3.In.2, CL.B.3.Su.2)

2.4. Estimate the solution to problems involving money to accomplish functional tasks (e.g., estimating the cost of electricity for a year, estimating the total cost of groceries for a week). (CL.B.3.In.2, CL.B.3.Su.2)

2.5. Estimate the solution to problems involving time to accomplish functional tasks (e.g., estimating the time it will take to reach a destination, estimating the amount of time involved in completing each step of an assignment). (CL.B.3.In.2, CL.B.3.Su.2)

2.6. Estimate the solution to problems involving capacity or volume to accomplish functional tasks (e.g., selecting the right size of bowl to use in cooking). (CL.B.3.In.2, CL.B.3.Su.2)

2.7. Estimate the solution to problems involving weight when completing functional tasks (e.g., estimating how many pounds of fruit must be purchased or how many ounces of cheese to buy for a pizza, estimating how much weight you can lift when working out). (CL.B.3.In.2, CL.B.3.Su.2)

3. Add and subtract whole numbers, decimals, and fractions to solve problems related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other:

Addition

3.1. Identify the meaning of the concept of addition (e.g., totaling, summing up, putting together, depositing, plus sign [+]). (CL.B.3.In.1, CL.B.3.Su.1)

3.2. Identify situations in daily living when addition is used (e.g., totaling distances traveled over several days, determining the number of members on both teams, determining how much inventory was sold). (CL.B.3.In.1, CL.B.3.Su.1)

3.3. Add numbers accurately to accomplish functional tasks. (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ decimals _____ ❑ fractions, mixed numbers
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

3.4. *Add two sets of objects, sums through 12. (Mathematics C 15: IV)*

3.5. *Add a 2-digit number to a 2-digit number without regrouping, sums through 99. (Mathematics C 16: V)*

3.6. *Add two numbers each having no more than two decimal places. (Mathematics J 77: VII)*

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3.7. *Add a 1 or 2-digit number to a 2-digit number with no more than one regrouping.* *(Mathematics C 19: VI)*

3.8. *Add one 2 or 3-digit number to a 3-digit number with regrouping.* *(Mathematics C 21: VII)*

3.9. Solve problems involving addition of whole numbers to accomplish functional tasks (e.g., counting paper money, adding amount of money spent from checkbook in one month, determining a monthly budget, adding number of hours worked in a pay period, adding weight gained in two months). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

3.10. *Apply addition skills involving two 1-digit numbers to solve one-step applied problems.* *(Mathematics C 17: III)*

3.11. *Apply addition skills involving two 2-digit numbers to solve one-step applied problems without regrouping.* *(Mathematics C 20: VI)*

3.12. *Use addition skills involving 2-digit numbers to solve one-step applied problems with regrouping.* *(Mathematics C 22: VII)*

3.13. Solve problems involving addition of numbers with decimals to accomplish functional tasks (e.g., totaling prices). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

3.14. Solve problems involving addition of numbers with fractions to accomplish functional tasks (e.g., determining how much fencing is needed for a garden, determining how much border is needed to fit the wall space, doubling a recipe). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ like denominators _____ ❑ unlike denominators _____ ❑ mixed numbers

3.15. *Use addition and subtraction to solve applied problems involving simple fractions and percents.* *(Mathematics J 76: VII)*

Subtraction

3.16. Identify the meaning of the concept of subtraction (e.g., deducting, taking away, withdrawal, loss, minus sign [-]). (CL.B.3.In.1, CL.B.3.Su.1)

3.17. Identify situations in daily living when subtraction is used (e.g., determining how many newspapers are left to deliver, comparing the difference in sizes of classes, determining how many hours are left to work, determining how many miles are left to drive). (CL.B.3.In.1, CL.B.3.Su.1)

3.18. Subtract numbers accurately to accomplish functional tasks. (CL.B.3.In.1, CL.B.3.Su.1)

Specify:	_____ ❑ single digit	_____ ❑ multiple digits
	_____ ❑ decimals	_____ ❑ fractions, mixed numbers
	_____ ❑ without regrouping	_____ ❑ with regrouping
Specify method:	_____ ❑ mentally	_____ ❑ uses a table or chart
	_____ ❑ uses counters or tallies	_____ ❑ uses an abacus
	_____ ❑ uses a calculator	_____ ❑ other: _____

3.19. *Subtract one set of objects from another set no larger than 12. (Mathematics D 23: IV)*

3.20. *Subtract a 2-digit number from a 2-digit number without regrouping. (Mathematics D 24: V)*

3.21. *Apply subtraction skills involving two 1-digit numbers to solve one-step applied problems. (Mathematics D 25: V)*

3.22. *Subtract a 2 or 3-digit number from a 3-digit number with no more than one regrouping. (Mathematics D 27: VI)*

3.23. *Apply subtraction skills involving 2-digit numbers to solve one-step applied problems without regrouping. (Mathematics D 28: VI)*

3.24. *Subtract a 3-digit number from a 3-digit number with regrouping. (Mathematics D 29: VII)*

3.25. *Use subtraction skills involving 2-digit numbers to solve one-step applied problems with regrouping. (Mathematics D 30: VII)*

3.26. Solve problems involving subtraction of whole numbers to accomplish functional tasks (e.g., determining how much weight was lost last year, determining how much farther one trip is compared to another, determining by how many points one team beat another). (CL.B.3.In.2, CL.B.3.Su.2)

Specify:	_____ ❑ single digit	_____ ❑ multiple digits
	_____ ❑ without regrouping	_____ ❑ with regrouping
Specify method:	_____ ❑ mentally	_____ ❑ uses a table or chart
	_____ ❑ uses counters or tallies	_____ ❑ uses an abacus
	_____ ❑ uses a calculator	_____ ❑ other: _____

3.27. Solve problems involving subtraction of numbers with decimals to accomplish functional tasks (e.g., subtracting the value of outstanding checks when balancing a checkbook, determining the amount of change to give to a customer). (CL.B.3.In.2, CL.B.3.Su.2)

3.28. Solve problems involving subtraction of numbers with fractions to accomplish functional tasks (e.g., determining how much fabric will be left when you cut off a half a yard). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____❑ like denominators _____❑ unlike denominators _____❑ mixed numbers

4. Multiply and divide whole numbers, decimals, and fractions to solve problems related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other:
_____

Multiplication

4.1. Identify the meaning of the concept of multiplication (e.g., double, triple, times, multiplication sign [x]). (CL.B.3.In.1, CL.B.3.Su.1)

4.2. Identify situations in daily living when multiplication is used (e.g., determining the total cost of tickets for a group, determining how many people eight buses can hold). (CL.B.3.In.1, CL.B.3.Su.1)

4.3. Multiply numbers accurately. (CL.B.3.In.1, CL.B.3.Su.1)

Specify:	_____ ❑ single digit	_____ ❑ multiple digits
	_____ ❑ decimals	_____ ❑ fractions, mixed numbers
	_____ ❑ without regrouping	_____ ❑ with regrouping
Specify method:	_____ ❑ mentally	_____ ❑ uses a table or chart
	_____ ❑ uses counters or tallies	_____ ❑ uses an abacus
	_____ ❑ uses a calculator	_____ ❑ other: _____

4.4. *Identify products of multiplication facts through 81. (Mathematics H 67: VI)*

4.5. *Multiply a 2-digit number by a 1-digit number. (Mathematics H 68: VI)*

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4.6. Solve problems involving multiplication of whole numbers to accomplish functional tasks (e.g., determining how many tickets are needed for a family of four to attend eight games, determining the total amount paid on a loan). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

4.7. *Apply multiplication skills to solve one-step applied problems.* *(Mathematics H 70: VII)*

4.8. Multiply numbers with decimals to accomplish functional tasks (e.g., calculating amount of tax, determining amount of tax on an item, determining the amount to tip a waiter, determining amount of discount from a sale). (CL.B.3.In.2, CL.B.3.Su.2)

4.9. Multiply numbers with fractions to accomplish functional tasks (e.g., determining amount of discount from a sale, determining overtime if salary equals time and a half). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ like denominators _____ ❑ unlike denominators _____ ❑ mixed numbers

Division

4.10. Identify the meaning of the concept of division (e.g., portion, distribution, allocation, fraction, part, divided by, division sign [÷]). (CL.B.3.In.1, CL.B.3.Su.1)

4.11. Identify situations in daily living when division is used (e.g., calculating grade percentages, dividing students into groups, dividing amount owed for a large purchase into monthly payments). (CL.B.3.In.1, CL.B.3.Su.1)

4.12. Divide numbers accurately to accomplish functional tasks. (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ decimals _____ ❑ fractions, mixed numbers
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

4.13. *Identify basic division facts products through 81.* *(Mathematics I 71: VI)*

4.14. Solve problems involving division of whole numbers to accomplish functional tasks (e.g., determining how much profit was made per job, determining how long a trip would take if a car traveled at a given speed, determining cost per person for expenses on a trip). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without remainders _____ ❑ with remainders

Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other:

4.15 *Use division to solve one-step applied problems. (Mathematics I 72: VII)*

4.16. Divide numbers with decimals to accomplish functional tasks (e.g., budgeting monthly expenses, determining the package that has the lowest cost per unit). (CL.B.3.In.2, CL.B.3.Su.2)

4.17. Divide numbers with fractions to accomplish functional tasks (e.g., determining how many bows you can make from 1-3/4 yards of ribbon, if each takes 1/2 yard). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ like denominators _____ ❑ unlike denominators _____ ❑ mixed numbers

4.18. Solve problems involving averages to accomplish functional tasks (e.g., calculating final grade using test scores, calculating the batting average of a baseball player, calculating the average amount of sales per day). (CL.B.3.In.2, CL.B.3.Su.2)

5. Use ratio, proportion, and percents to solve problems related to personal life and the workplace (e.g., calculating rate of interest, combining liquids, creating scale drawings).

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other:
_____

5.1. Identify the meaning of the concept of percent (e.g., divided by 100, percent sign [%]). (CL.B.3.In.1, CL.B.3.Su.1)

5.2. Identify situations in daily living when percent is used (e.g., calculating grades or interest rates, charting growth by percentage increase or decrease). (CL.B.3.In.1, CL.B.3.Su.1)

5.3. Solve problems involving percent to accomplish functional tasks (e.g., calculating interest, determining amount used). (CL.B.3.In.2, CL.B.3.Su.2)

5.4. Identify the meaning of ratio (e.g., relation in amount, size, or quantity between things). (CL.B.3.In.1, CL.B.3.Su.1)

5.5. Identify situations in daily living when ratio is used (e.g., mixing cleaning solutions). (CL.B.3.In.1, CL.B.3.Su.1)

5.6. Identify the meaning of proportion (e.g., distribution, relation in number or quantity of one part to another). (CL.B.3.In.1, CL.B.3.Su.1)

5.7. Identify situations in daily living when proportion is used (e.g., scale drawings used in interior design). (CL.B.3.In.1, CL.B.3.Su.1)

5.8. Solve problems involving ratio and proportion to accomplish functional tasks. (CL.B.3.In.2, CL.B.3.Su.2)

6. Select and use measurement concepts and tools involving length, weight, and volume to solve problems related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

Linear Measurement

6.1. Identify the most appropriate units of linear measurement to accomplish functional tasks (e.g., measuring your height, calculating the length of a room, determining the distance on a trip). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ inches _____ ❑ feet _____ ❑ yards
_____ ❑ miles _____ ❑ centimeters _____ ❑ meters
_____ ❑ other: _____

6.2. Identify abbreviations for linear measurement units when completing functional tasks (e.g., reading the distance scale on a map, reading measurements for a room layout). (CL.B.1.In.1, CL.B.1.Su.1)
Specify: _____ ❑ linear—in., ft., yd., mi., cm., m.
_____ ❑ area—sq. ft., sq. yd., sq. mi.
_____ ❑ other: _____

6.3. Identify the most appropriate tools or equipment for linear measurement to complete functional tasks (e.g., length of tool, unit of measurement, effective and ineffective uses). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ ruler _____ ❑ tape measure _____ ❑ yard stick
_____ ❑ other: _____

6.4. *Determine which of three or more objects is smallest, largest, shortest, tallest. (Mathematics A 5: IV)*

6.5. *Identify ruler, yardstick, and tape measure. (Mathematics F 47: IV)*

6.6. Measure the length, width, or height of object or area accurately using appropriate tools or equipment to accomplish functional tasks (e.g., use a ruler to measure a short line, use a tape measure to measure a room). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ ruler _____ ❑ tape measure _____ ❑ yard stick
_____ ❑ other: _____

6.7. *Measure an object to the nearest inch. (Mathematics F 50: V)*

6.8. *Identify the length, width, or height of an object. (Mathematics F 54: VII*)

6.9. Identify equivalents for commonly used linear measurements to accomplish functional tasks (e.g., determining the length of a football field, determining if a 4-foot board will make a 52-inch shelf). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ 12 inches = 1 foot _____ ❑ 3 feet = 1 yard
_____ ❑ 36 inches = 1 yard _____ ❑ other: _____

6.10. Solve problems involving linear measurement to accomplish functional tasks (e.g., determining which rope is longer, determining miles to desired destination, determining the height of a fence, determining the length of a soccer field, determining amount of fabric needed to make curtains). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ no conversion _____ ❑ conversion

6.11. *Solve applied problems involving measurement using addition or subtraction. (Mathematics F 55: VII)*

Volume/Capacity

6.12. Identify the most appropriate units to measure volume or capacity when completing functional tasks (e.g., preparing a recipe, adding oil to the car, purchasing soft drinks). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ cup _____ ❑ pint _____ ❑ quart
_____ ❑ gallon _____ ❑ liter _____ ❑ teaspoon
_____ ❑ tablespoon _____ ❑ other: _____

6.13. Identify abbreviations for volume or capacity measurement units when completing functional tasks (e.g., reading the ingredients required in a recipe). (CL.B.1.In.1, CL.B.1.Su.1)
Specify: _____ ❑ volume—c., tsp., Tbs., gal., l.
_____ ❑ other: _____

6.14. Identify the most appropriate tools or equipment to measure volume or capacity when completing functional tasks (e.g., dry or liquid ingredients, amount to measure, accuracy). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ measuring cups and spoons _____ ❑ containers marked by volume
_____ ❑ other: _____

6.15. *Demonstrate an understanding of capacity concepts (e.g., least, most, empty, full). (Mathematics A 6: IV)*

6.16. Measure volume or capacity accurately using the appropriate tool or equipment to accomplish functional tasks (e.g., measuring a cup of bleach for the laundry, measuring gas into a tank for a lawnmower, measuring quarts of water for tea, measuring a dose of liquid medicine). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ cup _____ ❑ pint _____ ❑ quart
_____ ❑ gallon _____ ❑ liter _____ ❑ teaspoon
_____ ❑ tablespoon _____ ❑ other _____

6.17. *Identify a cup, quart, and gallon as tools to measure capacity. (Mathematics F 49: V)*

6.18. Identify volume or capacity measurement equivalents to accomplish functional tasks (e.g., determining how many cups of water are needed for two quarts of lemonade, determining how many tablespoons it takes to fill a 1/4 cup, determining how many pint jars are needed for a gallon of honey). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ 3 teaspoons = 1 tablespoon _____ ❑ 4 cups = 1 quart
_____ ❑ 4 quarts = 1 gallon _____ ❑ other: _____

6.19. *Determine capacity by measuring to the nearest cup, quart, or gallon. (Mathematics F 51: VI)*

6.20. Solve problems involving capacity or volume to accomplish functional tasks (e.g., determining how many glasses can be filled from a 1-liter bottle of soda, getting the right size of can for a recipe). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ no conversion _____ ❑ conversion

Weight

6.21. Identify the most appropriate units to measure weight to accomplish functional tasks (e.g., weighing an infant, buying produce). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ ounce _____ ❑ pound _____ ❑ ton

_____ ❑ other: _____

6.22. Identify abbreviations for weight measurement units when completing functional tasks (e.g., filling out a weight chart, writing a recipe). (CL.B.1.In.1, CL.B.1.Su.1)
Specify: _____ ❑ weight—oz., lb.
_____ ❑ other: _____

6.23. Identify the most appropriate tools or equipment to measure weight when completing functional tasks. (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ bathroom scales _____ ❑ postal scales _____ ❑ produce scales
_____ ❑ other: _____

6.24. Measure weight accurately using the appropriate tool when completing functional tasks (e.g., weighing yourself, weighing tomatoes at the grocery store, determining how much postage to put on a large envelope). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ bathroom scales _____ ❑ postal scales _____ ❑ produce scales
_____ ❑ other: _____

6.25. *Determine weight by measuring to the nearest pound. (Mathematics F 52: VI)*

6.26. Identify equivalents for units of weight when completing functional tasks (e.g., determining cost for mailing a box, determining if truck is strong enough to carry load of gravel). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ 16 ounces = 1 pound _____ ❑ 2000 pounds = 1 ton
_____ ❑ other: _____

6.27. Solve problems involving weight (e.g., determining how many pounds of gravel are needed for a walkway, determining how many ounces of cocoa to buy to make hot chocolate for a party). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ no conversion _____ ❑ conversion

7. Select and use measurement concepts involving time, temperature, and money to solve problems related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other:
_____

Time

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7.1. Identify the most appropriate units of time to accomplish functional tasks (e.g., making plans for the week, scheduling appointments, predicting the weather). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ seconds, minutes, hours _____ ❑ days, weeks, months, years
_____ ❑ seasons of the year _____ ❑ now, later, future, past
_____ ❑ today, tomorrow _____ ❑ other: _____

7.2. Identify abbreviations for units of time when completing functional tasks (e.g., reading days of the week on a calendar). (CL.B.1.In.1, CL.B.1.Su.1)
Specify: _____ ❑ time—min., hr., wk., mo., yr., Tues., Dec.
_____ ❑ other: _____

7.3. *Associate activities with morning, afternoon, and night (e.g., eating breakfast, going to bed). (Mathematics G 56: III)*

7.4. *Tell which day of the week comes before and after a given day. (Mathematics G 60: V)*

7.5. *Identify the days of the week. (Mathematics G 58: IV)*

7.6. *Indicate the date by month, day, and year in numerical form (e.g., 5/13/88). (Mathematics G 64: VI)*

7.7. *Distinguish between a.m. and p.m. to describe time of day. (Mathematics G 62: VI)*

7.8. Identify equivalent units of time when accomplishing functional tasks (e.g., determining how many hours to allow for a 90-minute activity). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ 60 seconds = 1 minute _____ ❑ 60 minutes = 1 hour
_____ ❑ 24 hours = 1 day _____ ❑ 7 days = 1 week
_____ ❑ other: _____

7.9. *Identify time equivalencies (e.g., 12 months = 1 year, 60 minutes = 1 hour, 24 hours = 1 day, 30 minutes = half hour, and 1 week = 7 days). (Mathematics G 63: VI)*

7.10. Identify time on a clock to accomplish functional tasks (e.g., timing a runner, setting a VCR to tape a show, estimating time to reach a destination). (CL.B.3.In.1, CL.B.3.Su.1)
Specify type of clock: _____ ❑ analog _____ ❑ digital
Specify interval: _____ ❑ hour/half hour _____ ❑ minutes

7.11. *Tell time to the hour. (Mathematics G 57: IV)*

7.12. *Tell time to the hour and half hour. (Mathematics G 59: V)*

7.13. *Indicate time in hours and minutes using proper notation (e.g., 1:28). (Mathematics G 65: VI)*

7.14. Identify the date on a calendar to accomplish functional tasks (e.g., planning a party, scheduling an appointment). (CL.B.3.In.1, CL.B.3.Su.1)

7.15. *Given a date, identify the day of the week on a calendar. (Mathematics G 61: V)*

7.16. Determine the elapsed time between events to accomplish functional tasks (e.g., taking medication every four hours, determining when to schedule next appointment, determining how much time is left to finish the test, determining if warranty is still good). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ conversion _____ ❑ no conversion

7.17. Solve problems involving time to accomplish functional tasks (e.g., setting a VCR to tape a television show, determining how long it has been since last dental checkup). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ conversion _____ ❑ no conversion

7.18. *Using addition and subtraction, solve applied problems involving years, months, weeks, days, or hours. (Mathematics G 66: VII)*

Temperature

7.19. Identify the most appropriate units to measure temperature to accomplish functional tasks (e.g., understanding the weather report from another country, reading an oral thermometer, preparing food, reading a temperature gauge in a freezer). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ degrees Fahrenheit _____ ❑ degrees Celsius

7.20. Identify the meaning of commonly used temperatures to accomplish functional tasks (e.g., reading a thermometer to identify a high fever, determining if the freezer is cold enough to make ice, setting a thermostat in a room). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ freezing and boiling points of water _____ ❑ normal body temperature
_____ ❑ comfortable room temperature _____ ❑ other: _____

7.21. Identify the time and temperature as represented on electronic signs on buildings in the community. (CL.B.1.In.1, CL.B.1.Su.1)

7.22. Identify the most appropriate equipment to measure temperature when completing functional tasks (e.g., purpose, limits, accuracy, type of readout). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ thermometers—weather, oral, cooking
_____ ❑ thermostat—furnace, car, motor
_____ ❑ other: _____

7.23. *Identify tools to measure temperature (e.g., thermometer, thermostat). (Mathematics F 48: IV)*

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7.24. Measure temperature accurately using the appropriate tool or equipment to accomplish functional tasks (e.g., using a meat thermometer to determine if a roast is fully cooked, reading the thermostat to find the temperature in a room). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ thermometer—weather, oral, cooking
_____ ❑ thermostat—furnace, car, motor
_____ ❑ other: _____

7.25. *Determine the temperature using Fahrenheit thermometers. (Mathematics F 53: VI)*

7.26. Solve problems involving temperature to accomplish functional tasks (e.g., checking the oven's temperature for cooking). (CL.B.3.In.2, CL.B.3.Su.2)

Money

7.27. Identify the names and values of coins and bills to accomplish functional tasks (e.g., counting money, paying for an item, putting correct change into a vending machine, paying for a cab fare). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ to $1.00_____ ❑ to $5.00_____ ❑ to $20.00
_____ ❑ to $100.00 _____ ❑ other: _____

7.28. *Identify coins as money. (Mathematics E 31: III)*

7.29. *Identify the coins: penny, nickel, dime, and quarter. (Mathematics E 32: IV)*

7.30. *Identify the cent (¢) sign and the dollar ($) sign. (Mathematics E 33: IV)*

7.31. *Identify the cent value of a penny, a nickel, a dime, a quarter, and the dollar value of bills through $10. (Mathematics E 35: V)*

7.32. *Identify money values not to exceed $100 (e.g., $62.43). (Mathematics E 42: VI*)

7.33. Count coins and bills to accomplish functional tasks (e.g., making penny rolls to take to a bank, using quarters to pay for a $2.00 item, paying the bill at a restaurant). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ to $1.00_____ ❑ to $5.00_____ ❑ to $20.00
_____ ❑ to $100.00 _____ ❑ other: _____

7.34. Identify common coin combinations to accomplish functional tasks (e.g., paying a toll on a highway, paying bus fare, using pay phones, buying a newspaper from a stand, purchasing gum from a machine, placing money in a parking meter). (CL.B.3.In.1, CL.B.3.Su.1)

7.35. Determine equivalent amounts of money using coins and paper currency to accomplish functional tasks (e.g., giving change for a dollar, collecting one hundred dollars in small bills). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ to $1.00_____ ❑ to $5.00_____ ❑ to $20.00

_____ ❑ to $100.00 _____ ❑ other: _____

7.36. *Determine equivalent amounts using pennies, nickels, dimes, and quarters (not to exceed $1). (Mathematics E 37: V)*

7.37. *Determine equivalent amounts not to exceed $10 using coins and paper currency. (Mathematics E 41: VI)*

7.38. Use numbers and symbols to represent amounts of money to accomplish functional tasks (e.g., adding amounts of money). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ to $1.00_____ ❑ to $5.00_____ ❑ to $20.00
_____ ❑ to $100.00 _____ ❑ other: _____

7.39. *Write money values not to exceed $10. (Mathematics E 38: V)*

7.40. Determine the total cost of items to accomplish functional tasks (e.g., determining how much money is needed to purchase the items). (CL.B.3.In.2, CL.B.3.Su.2)

7.41. Compare the cost of two items to accomplish functional tasks (e.g., determining the least expensive brand in a grocery store, determining how much it would cost to buy the name brand). (CL.B.3.In.2, CL.B.3.Su.2)

7.42. *Identify which costs more or less through $5, given the cost of two items. (Mathematics E 36: V)*

7.43. *Solve applied problems involving comparison shopping. (Mathematics E 46: VII)*

7.44. Calculate correct change to accomplish functional tasks (e.g., selling items, verifying change given from a vending machine, counting change as a customer). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ to $1.00_____ ❑ to $5.00_____ ❑ to $10.00
_____ ❑ to $20.00 _____ ❑ to $100.00 _____ ❑ other: _____

7.45. *Determine the change to be received from a $5 bill after a purchase (with a calculator, if needed). (Mathematics E 40: VI)*

7.46. Solve problems involving discounts to accomplish functional tasks (e.g. determining cost if shirt is 30% off, determining cost of an item with a rebate). (CL.B.3.In.2, CL.B.3.Su.2)

7.47. Solve problems involving rate of interest and sales tax to accomplish functional tasks (e.g., interest on a car loan, sales tax). (CL.B.3.In.2, CL.B.3.Su.2)

7.48. Identify purposes and functions of banks and credit unions (e.g., financial transactions, maintaining a savings account, establishing credit for future loans). (IF.A.2.In.1, IF.A.2.Su.1)

7.49. *Associate the financial institution (e.g., bank, credit union) with money.* *(Mathematics E 34: IV)*

7.50. *Identify the purposes of a checking and savings account.* *(Mathematics E 39: V)*

7.51. *Identify which documents to show for proper identification for check cashing.* *(Mathematics E 43: VI)*

7.52. *Complete a check and deposit slip and record in check register.* *(Mathematics E 44: VI)*

7.53. *Complete forms associated with a savings account.* *(Mathematics E 45: VI)*

8. Apply concepts of geometry and spatial relationships in situations related to personal life and the workplace (e.g., using blueprints, diagrams, maps, models).

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

8.1. Identify 2-dimensional shapes to accomplish functional tasks (e.g., drawing a circle, identifying a yield sign, buying a mat for a picture frame, finding a tablecloth for a table). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ square _____ ❑ rectangle _____ ❑ triangle _____ ❑ circle
_____ ❑ other: _____

8.2. Identify 3-dimensional shapes to accomplish functional tasks (e.g., selecting a tube for packaging a poster for shipping, making a cone for frosting a cake). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ cube _____ ❑ sphere _____ ❑ cylinder _____ ❑ cone
_____ ❑ other: _____

8.3. Use points, lines, and line segments to accomplish functional tasks (e.g., making a scale drawing of a room, identifying the distance between two points on a map). (CL.B.3.In.2, CL.B.3.Su.2)

8.4. Use angles to accomplish functional tasks (e.g., rearranging furniture, laying tiles on a diagonal, hanging a bulletin board, folding a napkin in a triangle, identifying angle of release when shooting a basketball). (CL.B.3.In.2, CL.B.3.Su.2)

8.5. Use parallel or perpendicular lines to accomplish functional tasks (e.g., aligning two pictures on a wall, drawing a map that shows the intersection of two streets). (CL.B.3.In.2, CL.B.3.Su.2)

8.6. Identify functional situations when it is useful to locate coordinate points on a grid (e.g., reading a map, determining direction of coordinates when traveling on a boat). (CL.B.3.In.1, CL.B.3.Su.1)

8.7. Solve problems involving the perimeter or area of a rectangle or square to accomplish functional tasks (e.g., calculating the distance traveled around a block for exercising, determining the area of a room to purchase carpet). (CL.B.3.In.2, CL.B.3.Su.2)

9. Apply effective algebraic problem-solving strategies in situations related to personal life and the workplace (e.g., classification schemes, formulas, patterns, graphs).

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

CL.B.4.In.1 identify problems and examine alternative solutions.

CL.B.4.In.2 implement solutions to problems and evaluate effectiveness.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt

___ assistive technology ___ supervision ___ other: _____

Algebraic Thinking

9.1. Identify patterns and relationships among numbers when accomplishing functional tasks (e.g., finding the odd numbers, estimating the height of a flight of stairs). (CL.B.3.In.1, CL.B.3.Su.1)

9.2. Apply a pattern or relationship to explain how a change in one quantity results in a change in another when accomplishing functional tasks (e.g., doubling a recipe). (CL.B.3.In.2, CL.B.3.Su.2)

9.3. Identify the variables and operations expressed in a formula or equation to accomplish functional tasks (e.g., determining tip for a restaurant bill—total bill x 15%; centering a picture—length/2; calculating unit costs—price is 3 lbs./$1). (CL.B.3.In.1, CL.B.3.Su.1)

9.4. Use a formula or equation to solve a problem involving mathematical concepts (e.g., to determine the area of a room—l x w; to determine the overdue book fine—days x fine

each day; to determine amount of time it will take to travel to a different city—distance divided by rate = time). (CL.B.3.In.2, CL.B.3.Su.2)

9.5. Find the value of an unknown variable in a formula or equation to accomplish functional tasks (e.g., calculating the rate of travel given the distance and time—r = d/t, calculating salary given hourly wage and hours worked—wage x hours = salary). (CL.B.3.In.2, CL.B.3.Su.2)

9.6. Substitute variables in a formula or equation to accomplish functional tasks (e.g., comparing Centigrade to Fahrenheit temperature readings, doubling a recipe, converting square feet to square yards when measuring carpet for a room). (CL.B.3.In.2, CL.B.3.Su.2)

Solving Mathematical Problems

9.7. Follow a systematic approach when using mathematical concepts and processes to solve problems in accomplishing functional tasks. (CL.B.4.In.1, CL.B.4.In.2, CL.B.4.Su.1, CL.B.4.Su.2)

Specify: _____ ❑ determine nature of the problem
_____ ❑ select correct technique
_____ ❑ make reasonable estimate of results
_____ ❑ apply operation or procedures to obtain result
_____ ❑ check results for accuracy
_____ ❑ explain results
_____ ❑ other: _____

9.8. Determine whether insufficient or extraneous information is given in solving particular mathematical problems (e.g., "Do I have all the information I need?" "What does this information have to do with the problem?"). (CL.B.4.In.1, CL.B.4.Su.1)

9.9. Express mathematical problems using alternative methods to accomplish functional tasks. (CL.B.4.In.2, CL.B.4.Su.2)

Specify: _____ ❑ drawing pictures or diagrams _____ ❑ using concrete objects
_____ ❑ paraphrasing _____ ❑ using models
_____ ❑ other: _____

10. Apply concepts of probability and data analysis in situations related to personal life and the workplace (e.g., predicting likelihood, interpreting average and percent).

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt

___ assistive technology ___ supervision ___ other: _____

10.1. Identify the meaning of basic concepts of chance and probability (e.g., How likely? What are the odds? What do you predict will happen? Can you count on it? What is the possibility? How do you know?). (CL.B.3.In.1, CL.B.3.Su.1)

10.2. Identify situations in daily life when the concepts of chance and probability are used (e.g., in weather forecasts—a 30% chance of rain; in winning the lottery—a million-to-one chance to win; in a playoff series for a championship a team is favored 2-1 to win a game). (CL.B.3.In.1, CL.B.3.Su.1)

10.3. Make a reasonable prediction of the likelihood of a simple event occurring (e.g., likelihood of your football team winning the next game). (CL.B.3.In.2, CL.B.3.Su.2)

10.4. Determine the odds for and the odds against a given situation (e.g., raining on a particular day, winning the lottery). (CL.B.3.In.2, CL.B.3.Su.2)

11. Interpret graphs, tables, and other types of data displays in situations related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other:

11.1. Identify functional situations when it is useful to gather and organize data (e.g., calculating a bowling average, keeping track of monthly expenditures, charting the growth of a child, preparing to file a tax return). (CL.B.3.In.1, CL.B.3.Su.1)

11.2. Identify the meaning of measures of central tendency to accomplish functional tasks. (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ mean (average)—estimating the average cost of school supplies
_____ ❑ mode (most frequent)—determining when a restaurant has the most customers

11.3. Solve problems using measures of central tendency to accomplish functional tasks (e.g., determining the most frequent exam scores, determining the average number of customers for a paper route). (CL.B.3.In.2, CL.B.3.Su.2)

11.4. Identify the meaning of information that displayed graphically in various forms (e.g., locate the team with the highest scores, locate high temperatures in a weather report). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ charts _____ ❑ graphs _____❑ tables _____ ❑ other: _____

11.5. Solve problems using information displayed in charts and tables to accomplish functional tasks (e.g., determining the highest temperature for the week from a bar graph,

determining from a pie graph what percentage of time a student spends sleeping, determining the class's favorite ice cream flavor from a graph). (CL.B.3.In.2, CL.B.3.Su.2)

12. Use calculators and other electronic tools to assist with computation.

CL.C.2.In.2 use appropriate technology and equipment to complete tasks in the workplace.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other:
_____

12.1. Identify the most appropriate electronic tools to use in solving selected mathematical problems (e.g., calculator, adding machine, automatic cash register). (CL.C.2.In.1, CL.C.2.In.2)

12.2. Identify situations when it is appropriate to use electronic tools to assist with calculations (e.g., balancing checkbook, working as a cashier, making out a budget). (CL.C.2.In.2, CL.C.2.Su.2)

12.3. Demonstrate skills needed to use a calculator correctly. (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ turning on and off
_____ ❑ entering a number
_____ ❑ entering a function—add, subtract, multiply, divide
_____ ❑ getting a total
_____ ❑ using percent
_____ ❑ clearing the display
_____ ❑ correcting a mistake
_____ ❑ other: _____

12.4. Use a calculator to assist with computation to accomplish functional tasks (e.g., balancing a checkbook, determining purchase price of a 30% off sale, determining the average of five grades, determining the tax on a hotel room). (CL.C.2.In.2, CL.C.2.Su.2)

12.5. *Use a calculator to perform complex addition computations. (Mathematics C 18: VI)*

12.6. *Use a calculator to perform complex subtraction computations. (Mathematics D 26: VI)*

12.7. *Use a calculator to perform complex division computations. (Mathematics I 73: VII)*

12.8. *Use a calculator to perform complex multiplication computations. (Mathematics H 69: VII)*

Florida

COURSE DESCRIPTION – Consumer Mathematics

Subject Area: Mathematics

Course Number: 1205370

Course Title: Consumer Mathematics

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to enable students to develop knowledge and skills in problem solving, communication, reasoning, and connections as related to consumer services and personal financial management.

The content should include, but not be limited to, the following:

- purchase and sales of goods and services
- cost of credit
- banking services
- investments
- job-related mathematics
- personal income and taxes
- retirement
- insurance
- budgeting
- housing rental and ownership

- automobile rental and ownership
- commercial transportation
- appropriate use of calculators and other technology

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

Course student performance standards must be adopted by the district, and they must reflect appropriate Sunshine State Standards benchmarks.

B. Special Note. None

C. Course Requirements. These requirements include, but are not limited to, the benchmarks from the Sunshine State Standards that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Use mathematical problem-solving strategies to solve problems relating to consumer needs, personal money management, and financial management.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

MA.B.3.4.1	solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.
MA.C.3.4.1	represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry*.
MA.D.1.4.1	describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
MA.D.1.4.2	determine the impact when changing parameters of given functions.
MA.E.1.4.1	interpret data that has been collected, organized, and displayed in charts, tables, and plots.
MA.E.3.4.2	explain the limitations of using statistical techniques and data in making inferences and valid arguments.

2. Use mathematical skills appropriate to consumer mathematics.

MA.A.1.4.1	associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.
MA.A.1.4.4	understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, *scientific notation*, exponents, *radicals, absolute value, and logarithms.*
MA.A.2.4.2	understand and use the real number system.
MA.A.3.4.3	add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.
MA.A.5.4.1	apply special number relationships such as sequences and series to real-world problems.

MA.B.1.4.1	use *concrete and graphic models to derive* formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.
MA.B.1.4.2	use concrete and graphic models to derive formulas for finding rate, distance, time, *angle measures, and arc lengths*.
MA.E.1.4.2	calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data.

Florida

COURSE DESCRIPTION – Explorations in Mathematics I

Subject Area: Mathematics
Course Number: 1205500
Course Title: Explorations in Mathematics I
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to provide experiences in problem solving, communication, reasoning, and connections in mathematics.

The content should include, but not be limited to, the following:

- number and operation sense
- estimation
- mental mathematics
- algebraic relationships
- patterns and functions
- ratio and proportion
- geometric relationships
- measurement
- spatial relationships
- statistics and probability
- appropriate use of calculators and other technology

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

Course student performance standards must be adopted by the district, and they must reflect appropriate Sunshine State Standards benchmarks.

B. Special Note. None

C. Course Requirements. These requirements include, but are not limited to, the benchmarks from the Sunshine State Standards that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Apply knowledge of the relationships among numbers in the exploration and solution of real-world problems.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of *real and complex* numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, *scientific notation*, exponents, *radicals, absolute value, and logarithms*.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

MA.A.4.4.1 use estimation strategies *in complex situations* to predict results and to check the reasonableness of results.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

2. Use measurement processes and manipulatives and patterns among two- and three-dimensional geometric figures to determine formulas for perimeter, area, and volume.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths*.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

MA.B.4.4.2 select and use appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry*.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, *and functions* using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters *of given functions.*

3. Use quantitative tools in exploring real-world data.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations *by applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams, *and formulas for permutations and combinations.*

MA.E.2.4.2 determine the probability for simple *and compound* events *as well as independent and dependent events*.

MA.E.3.4.1 design and perform real-world statistical experiments *that involve more than one variable*, then analyze results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

4. Use a variety of mathematical models, including manipulatives, algorithms, tables, graphs, linear equations and inequalities, and spatial representations to solve real-world problems.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths*.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.2.4.1 represent real-world problem situations using finite graphs, *matrices*, sequences, *series, and recursive relations*.

Florida

COURSE DESCRIPTION – Explorations in Mathematics II

Subject Area: Mathematics

Course Number: 1205510

Course Title: Explorations in Mathematics II

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to provide experiences in problem solving, communication, reasoning, and connections in mathematics.

The content should include, but not be limited to, the following:

- number and operation sense
- estimation
- mental mathematics
- algebraic relationships
- patterns and functions
- ratio and proportion
- geometric relationships
- measurement
- spatial relationships
- statistics and probability
- appropriate use of calculators and other technology

- counting principles
- trigonometric relationships

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

Course student performance standards must be adopted by the district, and they must reflect appropriate Sunshine State Standards benchmarks.

B. Special Note. None

C. Course Requirements. These requirements include, but are not limited to, the benchmarks from the Sunshine State Standards that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Use the power of numbers to analyze, solve, and verify solutions to real-world problems.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, *scientific notation*, exponents, *radicals, absolute value, and logarithms*.

MA.A.2.4.2 understand and use the real number system.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

MA.A.4.4.1 use estimation strategies *in complex situations* to predict results and to check the reasonableness of results.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

2. Apply measurement processes to analyze, describe relationships, and solve real-world problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths*.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

MA.B.4.4.2 select and use appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

3. Use quantitative tools to analyze, draw inferences, and make decisions based on real-world data.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations *by applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams, *and formulas for permutations and combinations.*

MA.E.2.4.2 determine the probability for simple *and compound* events *as well as independent and dependent events.*

MA.E.3.4.1 design and perform real-world statistical *experiments that involve more than one variable,* then analyze results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

4. Apply the process of mathematical modeling to solve real-world problems and verify solutions.

MA.A.5.4.1	apply special number relationships such as sequences *and series* to real-world problems.
MA.B.1.4.1	use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.
MA.B.1.4.2	use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths.*
MA.C.2.4.1	understand geometric concepts such as *perpendicularity, parallelism, tangency, congruency, similarity,* reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, *and fractals.*
MA.C.3.4.1	represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.
MA.C.3.4.2	using a rectangular coordinate system (graph), apply and algebraically verify properties of two- and three-dimensional figures, including *distance, midpoint,* slope, *parallelism, and perpendicularity.*
MA.D.1.4.1	describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
MA.D.1.4.2	determine the impact when changing parameters of given functions.
MA.D.2.4.1	represent real-world problem situations using finite graphs, *matrices,* sequences, *series, and recursive relations.*

Florida

COURSE DESCRIPTION – Geometry, Grades 9-12

Subject Area: Mathematics

Course Number: 1206310

Course Title: Geometry

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop the geometric relationships and deductive strategies that can be used to solve a variety of real world and mathematical problems.

The content will include, but not be limited to, the following:

- geometric constructions
- terminology and fundamental properties of geometry
- deductive and inductive reasoning and their application to formal and informal proof
- formulas pertaining to the measurement of plane and solid figures
- coordinate geometry and transformations on the coordinate plane
- exploration of geometric relationships such as parallelism, perpendicularity, congruence, and similarity
- properties of circles
- right triangle trigonometry

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. **Special Note.** Students earning credit in Geometry may not earn credit in Geometry Honors.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Demonstrate an understanding of the terminology and fundamental properties of geometry.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).

2. Demonstrate an understanding of deductive and inductive reasoning.

MA.C.1.4.1 use properties and relationships of geometric shapes to construct formal and informal proofs.

3. Demonstrate the ability to solve real-world problems by using geometric models and/or applying geometric properties.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding *rate,* distance, *time,* angle measures, and arc lengths.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, *time, weight/mass, temperature, money,* perimeter, area, and volume and estimate the effects of measurement errors on calculations.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.

4. Demonstrate an understanding of transformational and coordinate geometry.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three*-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

Florida

COURSE DESCRIPTION – Geometry Honors

Subject Area: Mathematics

Course Number: 1206320

Course Title: Geometry Honors

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop the geometric relationships and deductive strategies that can be used to solve a variety of real world and mathematical problems.

The content will include, but not be limited to, the following:

- geometric constructions
- terminology and fundamental properties of geometry
- deductive and inductive reasoning and their application to formal and informal proof
- formulas pertaining to the measurement of plane and solid figures
- coordinate geometry and transformations on the coordinate plane
- exploration of geometric relationships such as parallelism, perpendicularity, congruence, and similarity
- properties of circles
- right triangle trigonometry

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. **Special Note.** Students earning credit in Geometry Honors may not earn credit in Geometry.

The course requirements for this honors course are consistent with Geometry, Course Number 1206310. The district shall develop a description of additional requirements to provide for in-depth or enriched study of the course requirements.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Demonstrate an understanding of the terminology and fundamental properties of geometry.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).

2. Demonstrate an understanding of deductive and inductive reasoning.

MA.C.1.4.1 use properties and relationships of geometric shapes to construct formal and informal proofs.

3. Demonstrate the ability to solve real-world problems by using geometric models and/or applying geometric properties.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding *rate,* distance, *time,* angle measures, and arc lengths.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, *time, weight/mass, temperature, money*, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.

4. Demonstrate an understanding of transformational and coordinate geometry.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three-* dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

FLORIDA

COURSE DESCRIPTION – Informal Geometry

Subject Area: Mathematics

Course Number: 1206300

Course Title: Informal Geometry

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop the geometric knowledge that can be used to solve a variety of real-world and mathematical problems. Geometric relationships are developed inductively, with hands-on activities. The content of this course is less rigorous than Geometry, Course Number 1206310, and does not include formal deductive proofs.

The content will include, but not be limited to, the following:

- geometric constructions
- terminology and fundamental properties of geometry
- coordinate geometry and graphing of linear functions and inequalities
- inductive reasoning and informal proof
- introduction to deductive reasoning
- measurement of plane and solid figures, including perimeter, area, volume, and applications of the Pythagorean Theorem
- exploration and application of geometric relationships including parallelism, perpendicularity, congruence, and similarity

Informal Geometry

- symmetry and transformations, including flips, turns, and slides

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. Special Note. None

C. Course Requirements. These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course**. The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Demonstrate an understanding of the terminology and fundamental properties of geometry.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency*, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

2. Demonstrate an understanding of inductive reasoning.

MA.C.1.4.1 use properties and relationships of geometric shapes to construct *formal and* informal proofs.

3. Solve real-world problems by using geometric models and/or applying geometric properties.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements including length, *time*, *weight/mass, temperature, money,* perimeter, area, and volume, and estimate the effects of measurement errors on calculations.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry.*

4. Demonstrate an understanding of transformational and coordinate geometry.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, *and fractals*.

MA.C.3.4.2 use a rectangular coordinate system (graph), apply and algebraically verify properties of two-*and three*-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

Florida

COURSE DESCRIPTION – Integrated Mathematics I

Subject Area: Mathematics

Course Number: 1207310

Course Title: Integrated Mathematics I

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course, the first in a series of three, is to develop the algebraic and geometric concepts and processes that can be used to solve a variety of real-world and mathematical problems. Algebra and geometry should be integrated throughout the course.

The content should include, but not be limited to, the following:

- structure and properties of the real number system
- variables and algebraic expressions
- varied means for analyzing and expressing patterns, relations, and functions, including words, tables, rules, graphs, sequences, and algebraic equations
- solution strategies for simple linear equations and inequalities of one variable
- coordinate geometry and graphing of linear functions and inequalities
- varied solution strategies, algebraic and graphic, for linear functions and inequalities
- polynomials and operations with polynomials

Integrated Mathematics I

- relations expressed by ratio, rates, and proportion
- data analysis concepts and techniques appropriate to identify patterns and make predictions
- geometric constructions
- terminology and fundamental properties of geometry
- deductive and inductive reasoning and their application to formal and informal proof
- algebraic applications in geometry including angle, congruence, and similarity relationships, and derivation of the formulas for perimeter and area

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. **Special Note.** The following courses or series of courses satisfy the Algebra I graduation requirement:

1. Algebra I
2. Algebra I Honors
3. Algebra Ia and Algebra Ib
4. Applied Mathematics I and Applied Mathematics II
5. Integrated Mathematics I and Integrated Mathematics II

Students may receive credit for only one of the courses or series of courses listed above.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding and use of numbers and the real number system.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex numbers* in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

MA.A.2.4.2 understand and use the real number system.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

2. Demonstrate an understanding of the fundamental concepts of logic and of deductive and inductive reasoning.

MA.C.1.4.1 use properties and relationships of geometric shapes to construct *formal and* informal proofs.

3. Demonstrate an understanding of geometric terminology and properties and coordinate geometry.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency*, congruency, similarity, *reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals*.

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three-* dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

4. Demonstrate the ability to analyze and express patterns, relations, and functions in a variety of ways, including linear equations and coordinate graphs.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

5. Demonstrate the solution of real-world and mathematical problems, applying measurement, algebraic, and geometric techniques.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, *and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.*

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths.*

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, *and volume* and estimate the effects of measurement errors on calculations.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry***.**

MA.D.2.4.1 represent real-world problem situations using finite graphs, *matrices, sequences, series, and recursive relations***.**

6. Demonstrate the use of data analysis techniques.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data**.**

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

MA.E.3.4.1 design and perform real-world statistical experiments that involve more than one variable, then analyze results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

7. Demonstrate the use of probability techniques.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams, *and formulas for permutations and combinations*.

Florida

COURSE DESCRIPTION – Integrated II

Subject Area: Mathematics

Course Number: 1207320

Course Title: Integrated Mathematics II

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course, the second in a series of three, is to develop the algebraic and geometric concepts and processes that can be used to solve a variety of real-world and mathematical problems. Algebra and geometry should be integrated throughout the course.

The content should include, but not be limited to, the following:

- structure and properties of the real number system
- varied means for analyzing and expressing patterns, relations, and functions, including words, tables, rules, sequences and series, graphs, and algebraic equations
- coordinate geometry and graphing of linear and quadratic functions and inequalities
- varied solution strategies, algebraic and graphic, for linear and quadratic functions and inequalities, and for systems of equations
- operations with rational algebraic equations

- data analysis concepts and techniques including introductory statistics and probability
- fundamental concepts of logic, including Venn diagrams
- properties of circles
- application of the axiomatic approach in geometric and algebraic proofs
- algebraic applications in geometry including the Pythagorean Theorem, its converse, and related geometric theorems; and the derivation of formulas for surface area and volume

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. **Special Note.** The following courses or series of courses satisfy the Algebra I graduation requirement:

1. Algebra I
2. Algebra I Honors
3. Algebra Ia and Algebra Ib
4. Applied Mathematics I and Applied Mathematics II
5. Integrated Mathematics I and Integrated Mathematics II

Students may receive credit for only one of the courses or series of courses listed above.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding and use of the real number system.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

Integrated Mathematics II

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex numbers* in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

MA.A.2.4.1 understand *and use* the basic concepts of limits and infinity.

MA.A.2.4.2 understand and use the real number system.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

2. Demonstrate an understanding of the fundamental concepts of logic and of deductive and inductive reasoning.

MA.C.1.4.1 use properties and relationships of geometric shapes to construct formal and informal proofs.

3. Demonstrate an understanding of coordinate and transformational geometry.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency*, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, *and fractals*.

Integrated Mathematics II

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three-* dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

4. Demonstrate the ability to analyze and express patterns, relations, and functions in a variety of ways, including linear and quadratic equations and coordinate graphs.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

5. Demonstrate the solution of real-world and mathematical problems, applying measurement, algebraic, and geometric concepts and techniques.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths.*

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, *and* volume and estimate the effects of measurement errors on calculations.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.

Integrated Mathematics II

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, series*, and recursive relations.*

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, *and with matrices.*

6. Demonstrate the use of data analysis techniques.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determines the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion using* the sample population data and using appropriate technology, including calculators and computers.

MA.E.3.4.1 design and perform real-world statistical experiments that involve more than one variable, then analyze results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

7. Demonstrate the use of probability techniques.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams *and formulas for permutations and combinations.*

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

8. Demonstrate understanding and apply theories related to numbers.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

Florida

COURSE DESCRIPTION – Integrated Mathematics III

Subject Area: Mathematics

Course Number: 1207330

Course Title: Integrated Mathematics III

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course, the final in a series of three, is to develop the advanced algebraic and geometric concepts and process that can be used to solve a variety of real-world and mathematical problems.

The content should include, but not be limited to, the following:

- structure and properties of the complex number system
- relations, functions, and graphs extended to exponential and logarithmic functions and their relationships to one another
- operations with matrices
- conic sections and their applications
- proofs of trigonometric identities
- application of trigonometry and the properties of similarity and congruence of triangles.
- data analysis, including measures of central tendency and dispersion
- probability, permutations, and combinations

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

B. Special Note. None

C. Course Requirements. These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding and use of the real and complex number systems.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, and complex numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real and complex numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, and logarithms.

MA.A.2.4.1 understand and use the basic concepts of limits and infinity.

MA.A.2.4.2 understand and use the real number system.

MA.A.2.4.3 understand the structure of the complex number system.

2. Operate on expressions and matrices and solve exponential and logarithmic equations.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

Integrated Mathematics III

MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, series, *and recursive relations*.

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, and with matrices**.**

3. Demonstrate an understanding of the geometry associated with relations and functions.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.

4. Apply trigonometry and the properties of similarity and congruence of triangles to problem solving situations.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, *including length, time, weight/mass, temperature, money, perimeter, area, and volume* and estimate the effects of measurement errors on calculations.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry**.**

Integrated Mathematics III

5. Demonstrate an understanding of fundamental trigonometric identities.

MA.C.1.4.1 use properties and relationships of geometric shapes to construct formal and informal proofs.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

6. Demonstrate understanding and apply appropriate measures of central tendency and variability.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, standard deviation, and variance) for complex sets of data and determine the most meaningful measure to describe the data**.**

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by applying formulas to calculate measures of central tendency and dispersion using the sample population data and using appropriate technology, including calculators and computers.

MA.E.3.4.1 design and perform real-world statistical experiments that involve more than one variable, then analyze results and report findings.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

7. Demonstrate understanding and apply permutations and combinations.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams and formulas for permutations and combinations**.**

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

Florida
COURSE DESCRIPTION – Liberal Arts Mathematics

Subject Area: Mathematics
Course Number: 1208300
Course Title: Liberal Arts Mathematics
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education: all students will have access to calculators and computers; classroom activities will be student-centered; all courses will have increased emphasis on estimation; and evaluation will include alternative methods of assessment.

A. **Major concepts/content.** The purpose of this course is to strengthen mathematical skills necessary for further study of advanced mathematics.

The content should include, but not be limited to, the following:

- polynomials
- factoring
- algebraic expressions
- equations and inequalities
- functions, relations and graphs
- systems of linear equations and inequalities
- exponents
- radical expressions
- properties of two and three dimensional figures
- segments and angles
- similarity and congruence
- perimeter, area, and volume
- quadratic equations

B. **Special note.** In general this course will not count as one of the three required mathematics credits for freshman entry into state universities in Florida.

C. **Course Requirements.** After successfully completing this course, the student will:

1. Use first degree equations and inequalities in one or two variables in problem situations.

2. Demonstrate an understanding of functions, relations, and their graphs.

3. Demonstrate an understanding of polynomials and rational algebraic expressions.

4. Solve quadratic equations in problem situations.

5. Use appropriate vocabulary related to terms in algebra and geometry.

6. Demonstrate the ability to use the properties of similarity and the profiles of congruence of triangles to solve problems.

7. Demonstrate the ability to use the properties of polygons to solve problems.

8. Demonstrate an understanding of area, perimeter, and volume in problem situations.

Florida
COURSE DESCRIPTION – Life Skills Math: Grades 9-12

Subject Area: Academics: Subject Areas
Course Number: 7912340
Course Title: Life Skills Math: 9-12
Previous Course Title: Functional Math: Comprehensive
Credit: Multiple

A. **Major Concepts/Content.** The purpose of this course is to develop the fundamental mathematics skills to enable students with disabilities who are functioning at independent and supported levels to prepare to participate effectively in post-school adult living and in the world of work.

The content should include, but not be limited to, the following:

- numeration
- measurement
- money
- time
- computational skills
- geometry
- applications in personal life
- applications in the workplace

This course shall integrate the Sunshine State Standards and Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the individual student and to the content and processes of the subject matter. Students with disabilities shall:

CL.A.1.In.1 complete specified Sunshine State Standards with modifications as appropriate for the individual student.

CL.A.1.Su.1 complete specified Sunshine State Standards with modifications and guidance and support as appropriate for the individual student.

B. **Special Note.** This entire course may not be mastered in one year. A student may earn multiple credits in this course. The particular course requirements that the

student should master to earn each credit must be specified on an individual basis. Multiple credits may be earned sequentially or simultaneously.

This course is primarily designed for students functioning at independent and supported levels. Students functioning at independent levels are generally capable of working and living independently and may need occasional assistance. Students functioning at supported levels are generally capable of living and working with ongoing supervision and support. Three levels of functioning, independent, supported, and participatory, have been designated to provide a way to differentiate benchmarks and course requirements for students with diverse abilities. Individual students may function at one level across all areas, or at several different levels, depending on the requirements of the situation.

This course may also be used to accommodate the wide range of abilities within the population of students with disabilities. The particular benchmark for a course requirement should be selected for individual students based on their levels of functioning and their desired post-school outcomes for adult living and employment specified in the Transition Individual Educational Plan.

The level of functioning should be determined for each course requirement or performance objective. The key to determining the level is consideration of the amount of additional support and assistance that *must* be provided for the student. This support and assistance must be *beyond* what is typically provided for nondisabled individuals in performing the same type of behaviors or tasks. The following guidelines may be used to assist this process.

- For requirements/objectives mastered at the Independent Level, students are expected to be able to perform the behaviors identified for each benchmark *on their own* once they have mastered the knowledge and skills.
- For requirements/objectives mastered at the Supported Level, mastery should be determined with consideration of the amount and type of *guidance and support* necessary to the student to perform the behavior. This generally consists of some type of prompting or supervision.

  Physical prompt—a touch, pointing, or other type of gesture as a reminder

  Verbal prompt—a sound, word, phrase, or sentence as a reminder

  Visual prompt—color coding, icons, symbols, or pictures as a reminder

  Assistive technology—an alarm, an electronic tool

  Supervision—from occasional inspection to continuous observation

- For requirements/objectives mastered at the Participatory Level, mastery should be determined with consideration of the amount and type of *assistance*

necessary to the student to participate in the performance of the behavior.

- Physical assistance—from a person, such as full physical manipulation or partial movement assistance

  Assistive technology—full: props, bolsters, pads, electric wheelchair; partial: straps, lapboards, adapted utensils

The performance objectives are designed to provide teachers with ideas for short-term objectives for instructional planning. The performance objectives are not intended to be exhaustive of all the possible short-term objectives a student may need in this multiple credit course. Other objectives should be added as required by an individual student.

Instructional activities involving practical applications of course requirements may occur in naturalistic settings in home, school, and community for the purposes of practice, generalization, and maintenance of skills. These applications may require that the student acquire the knowledge and skills involved with the use of related technology, tools, and equipment.

C. Course Requirements. These requirements include, but are not limited to, the benchmarks from the Sunshine State Standards for Special Diploma that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate. Some requirements in this course are not fully addressed in the Sunshine State Standards for Special Diploma.

After successfully completing this course, the student will:

1. Use whole numbers and common fractions and decimals in situations related to personal life and the workplace.

CL.B.3.In.1	identify mathematical concepts and processes to solve problems.
CL.B.3.In.2	apply mathematical concepts and processes to solve problems.
CL.B.3.Su.1	identify mathematical concepts and processes needed to accomplish functional tasks—with guidance and support.
CL.B.3.Su.2	apply mathematical concepts and processes needed to accomplish functional tasks—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

Numbers

Life Skills Math: 9-12

1.1. Identify equal and unequal quantities to accomplish functional tasks (e.g., cutting a sandwich in half, sharing a plate of cookies, mixing water and vinegar for cleaning, dealing cards for a game). (CL.B.3.In.1, CL.B.3.Su.1)

1.2. *Distinguish between all, some, and none. (Mathematics A 1: III)*

1.3. *Demonstrate the use of one-to-one correspondence. (Mathematics B 7: III)*

1.4. Identify whole numbers to accomplish functional tasks (e.g., finding pages in a book, finding a street address, reading speed limit signs, reading temperature gauges, identifying bus numbers). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ to 10 _____ ❑ to 100 _____ ❑ to 1000
_____ ❑ to 10,000 _____ ❑ to 100,000

1.5. *Match numerals to corresponding sets of objects, 0 to 10. (Mathematics B 9: IV)*

1.6. *Reproduce numerals from 0 to 10. (Mathematics B 10: IV)*

1.7. *Identify numerals which correspond to sets of objects 11 to 100. (Mathematics B 12: V)*

1.8. Count objects to accomplish functional tasks (e.g., home—counting silverware for setting the table, getting towels for guests; leisure—counting number of seconds to go in a basketball game; workplace—counting screws to assemble a product, identifying how many rooms to clean). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ to 10 _____ ❑ to 100 _____ ❑ to 1000

1.9. *Count from 1 to 5. (Mathematics B 8: III)*

1.10. Use skip counting to accomplish functional tasks (e.g., counting large numbers of objects, counting money, counting items in inventory, counting off individuals to form teams). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ by 2s _____ ❑ by 5s
_____ ❑ by 10s _____ ❑ by 100s

1.11. *Count by 2's, 5's, and 10's to 100. (Mathematics B 13: V)*

1.12. Identify the whole number that comes before, after, or between a given number(s) to accomplish functional tasks (e.g., locating the date after a holiday on a calendar, searching for a book in the library according to number, filing charts by numerical order). (CL.B.3.In.1, CL.B.3.Su.1)

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Specify: _____ ❑ to 10 _____ ❑ to 100 _____ ❑ to 1000
_____ ❑ to 10,000 _____ ❑ to 100,000

1.13. Compare numbers to accomplish functional tasks (e.g., placing numbered pages in the correct order, comparing prices, comparing rental rates for apartments, comparing scores in a game to determine the winning team). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ to 10 _____ ❑ to 100 _____ ❑ to 1000
_____ ❑ to 10,000 _____ ❑ to 100,000

1.14. *Identify one and one more. (Mathematics A 2: III)*

1.15. Identify objects in a series by ordinal position to accomplish functional tasks (e.g., identifying the third game in a playoff, identifying the second sentence in a paragraph, identifying the third frame in bowling, identifying the last pay period of the year). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ first, middle, last _____ ❑ to 5th
_____ ❑ to 10th _____ ❑ to 100th

1.16. *Identify the first and last member in a group of objects. (Mathematics A 3: III)*

1.17. *Demonstrate understanding the concept of middle. (Mathematics A 4: IV)*

1.18. Identify the meaning of numerals when completing functional tasks (e.g., reading a street sign). (CL.B.1.In.1, CL.B.1.Su.1)

1.19. Write numerals when completing functional tasks (e.g., making an inventory). (CL.B.1.In.2, CL.B.1.Su.2)

1.20. Identify the meaning of number words when completing functional tasks (e.g., reading a newsletter, reading an amount on a check). (CL.B.1.In.1, CL.B.1.Su.1)

1.21. Identify the meaning of ordinal number words when completing functional tasks (e.g., identifying who is first in line, identifying what place a runner finished in a race, identifying when it is your turn). (CL.B.1.In.1, CL.B.1.Su.1)

1.22. *Read number words, zero to ten. (Mathematics B 11: V)*

1.23. *Read number words from eleven to one hundred. (Mathematics B 14: VI)*

Place Value

1.24. Use knowledge of place value for whole numbers and decimals to accomplish functional tasks (e.g., lining up whole numbers and decimals for solving computation

problems, reading and writing large numbers correctly, identifying the meaning of a number on a digital gauge or clock). (CL.B.3.In.2, CL.B.3.Su.2)

Specify whole numbers: _____ ❑ 1s _____ ❑ 10s _____ ❑ 100s
_____ ❑ 1000s _____ ❑ 10,000s _____ ❑ 100,000s
Specify decimals: _____ ❑ tenths _____ ❑ hundredths _____ ❑ thousandths

1.25. Round whole numbers and decimals to accomplish functional tasks (e.g., estimating distance when traveling, estimating time left for an activity, estimating cost of purchases). (CL.B.3.In.2, CL.B.3.Su.2)

Specify whole numbers: _____ ❑ 1s _____ ❑ 10s _____ ❑ 100s
_____ ❑ 1000s _____ ❑ 10,000s _____ ❑ 100,000s
Specify decimals: _____ ❑ tenths _____ ❑ hundredths _____ ❑ thousandths

Fractions/Decimals/Percents

1.26. Identify the meaning of fractional parts of an object, area, or set of items to accomplish functional tasks (e.g., measuring 1/3 cup of milk, cutting a pie into eighths, cutting a piece of wood in half). (CL.B.3.In.1, CL.B.3.Su.1)

Specify:
_____ ❑ halves _____ ❑ thirds
_____ ❑ fourths _____ ❑ fifths
_____ ❑ sixths _____ ❑ eighths
_____ ❑ tenths _____ ❑ twelfths
_____ ❑ other: _____

1.27. *Identify halves and fourths of an area. (Mathematics J 74: V)*

1.28. Identify the decimal equivalent of a percent (e.g., 98% = .98, 32% = .32) to accomplish functional tasks (e.g., multiplying and dividing percentages to calculate discounts, finding the average of test grades, finding 15% gratuity on a bill). (CL.B.3.In.1, CL.B.3.Su.1)

1.29. Identify the decimal equivalent of a fraction to accomplish functional tasks (e.g., determining discounts—half-off, calculating savings at a sale). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ 1/2 = 50% _____ ❑ 1/4 = 25% _____ ❑ 3/4 = 75%
_____ ❑ 1/3 = 33% _____ ❑ 2/3 = 67% _____ ❑ other: _____

1.30. *Identify simple fraction and percent equivalents (e.g., 1/2 = 50 %, 1/4 = 25%). (Mathematics J 75: VI)*

1.31. Identify the meaning of numerals with decimals and percents when completing functional tasks (e.g., reading a sale sign, reading a digital clock). (CL.B.1.In.1, CL.B.1.Su.1)

1.32. Write numerals with decimals and percents when completing functional tasks (e.g., listing the cost of items). (CL.B.1.In.2, CL.B.1.Su.2)

1.33. Identify the meaning of numerals with fractions when completing functional tasks (e.g., reading a recipe). (CL.B.1.In.1, CL.B.1.Su.1)

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1.34. Write numerals with fractions when completing functional tasks (e.g., writing a recipe). (CL.B.1.In.2, CL.B.1.Su.2)

2. Add and subtract whole numbers and decimals to solve problems related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

CL.B.3.Su.2 apply mathematical concepts and processes needed to accomplish functional tasks—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

Addition

2.1. Identify the meaning of the concept of addition (e.g., totaling, summing up, putting together, depositing, plus sign [+]). (CL.B.3.In.1, CL.B.3.Su.1)

2.2. Identify situations in daily living when addition is used (e.g., totaling distances traveled over several days, determining the number of members on both teams, determining how much inventory was sold). (CL.B.3.In.1, CL.B.3.Su.1)

2.3. Add numbers accurately to accomplish functional tasks. (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ decimals _____ ❑ fractions, mixed numbers
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

2.4. *Add two sets of objects, sums through 12. (Mathematics C 15: IV)*

2.5. *Add a 2-digit number to a 2-digit number without regrouping, sums through 99. (Mathematics C 16: V)*

2.6. *Add two numbers each having no more than two decimal places. (Mathematics J 77: VII)*

2.7. *Add a 1 or 2-digit number to a 2-digit number with no more than one regrouping. (Mathematics C 19: VI)*

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2.8. *Add one 2 or 3-digit number to a 3-digit number with regrouping.* *(Mathematics C 21: VII)*

2.9. Solve problems involving addition of whole numbers to accomplish functional tasks (e.g., counting paper money, adding amount of money spent from checkbook in one month, determining a monthly budget, adding number of hours worked in a pay period, adding weight gained in two months). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

2.10. *Apply addition skills involving two 1-digit numbers to solve one-step applied problems.* *(Mathematics C 17: V)*

2.11. *Apply addition skills involving two 2-digit numbers to solve one-step applied problems without regrouping.* *(Mathematics C 20: VI)*

2.12. *Use addition skills involving 2-digit numbers to solve one-step applied problems with regrouping.* *(Mathematics C 22: VII)*

2.13. Solve problems involving addition of numbers with decimals to accomplish functional tasks (e.g., totaling prices). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

Subtraction

2.14. Identify the meaning of the concept of subtraction (e.g., deducting, taking away, withdrawal, loss, minus sign [-]). (CL.B.3.In.1, CL.B.3.Su.1)

2.15. Identify situations in daily living when subtraction is used (e.g., determining how many newspapers are left to deliver, comparing the difference in sizes of classes, determining how many hours are left to work, determining how many miles are left to drive). (CL.B.3.In.1, CL.B.3.Su.1)

2.16. Subtract numbers accurately to accomplish functional tasks. (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ decimals _____ ❑ fractions, mixed numbers
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus

_____ ❑ uses a calculator _____ ❑ other: _____

2.17. *Subtract one set of objects from another set no larger than 12. (Mathematics D 23: IV)*

2.18. *Subtract a 2-digit number from a 2-digit number without regrouping. (Mathematics D 24: V)*

2.19. *Apply subtraction skills involving two 1-digit numbers to solve one-step applied problems. (Mathematics D 25: V)*

2.20. *Subtract a 2 or 3-digit number from a 3-digit number with no more than one regrouping. (Mathematics D 27: VI)*

2.21. *Apply subtraction skills involving 2-digit numbers to solve one-step applied problems without regrouping. (Mathematics D 28: VI)*

2.22. *Subtract a 3-digit number from a 3-digit number with regrouping. (Mathematics D 29: VII)*

2.23. *Use subtraction skills involving 2-digit numbers to solve one-step applied problems with regrouping. (Mathematics D 30: VII)*

2.24. Solve problems involving subtraction of whole numbers to accomplish functional tasks (e.g., determining how much weight was lost last year, determining how much farther one trip is compared to another, determining by how many points one team beat another). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without regrouping _____ ❑ with regrouping
Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

2.25. Solve problems involving subtraction of numbers with decimals to accomplish functional tasks (e.g., subtracting the value of outstanding checks when balancing a checkbook, determining the amount of change to give to a customer). (CL.B.3.In.2, CL.B.3.Su.2)

3. Use a calculator to multiply and divide whole numbers to solve problems related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

CL.B.3.Su.2 apply mathematical concepts and processes needed to accomplish functional tasks—with guidance and support.

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Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

Multiplication

3.1. Identify the meaning of the concept of multiplication (e.g., compound, double, triple, times, multiplication sign [x]). (CL.B.3.In.1, CL.B.3.Su.1)

3.2. Identify situations in daily living when multiplication is used (e.g., determining the total cost of tickets for a group, determining how many people eight buses can hold). (CL.B.3.In.1, CL.B.3.Su.1)

3.3. Multiply numbers accurately. (CL.B.3.In.1, CL.B.3.Su.1)

Specify:
_____ ❑ single digit _____ ❑ multiple digits
_____ ❑ decimals _____ ❑ fractions, mixed numbers
_____ ❑ without regrouping _____ ❑ with regrouping

Specify method:
_____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

3.4. *Identify products of multiplication facts through 81. (Mathematics H 67: VI)*

3.5. *Multiply a 2-digit number by a 1-digit number. (Mathematics H 68: VI)*

3.6. Solve problems involving multiplication of whole numbers to accomplish functional tasks (e.g., determining how many tickets are needed for a family of four to attend eight games, determining the total amount paid on a loan). (CL.B.3.In.2, CL.B.3.Su.2)

Specify:
_____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without regrouping _____ ❑ with regrouping

Specify method:
_____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

3.7. *Apply multiplication skills to solve one-step applied problems. (Mathematics H 70: VII)*

Division

3.8. Identify the meaning of the concept of division (e.g., portion, distribution, allocation, fraction, part, divided by, division sign [÷]). (CL.B.3.In.1, CL.B.3.Su.1)

3.9. Identify situations in daily living when division is used (e.g., calculating grade percentages, dividing students into groups, dividing money owed for a large purchase over a period of months). (CL.B.3.In.1, CL.B.3.Su.1)

3.10. Divide numbers accurately to accomplish functional tasks. (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ decimals _____ ❑ fractions, mixed numbers
_____ ❑ without regrouping _____ ❑ with regrouping

Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

3.11. *Identify basic division facts products through 81. (Mathematics I 71: VI)*

3.12. Solve problems involving division of whole numbers to accomplish functional tasks (e.g., determining how much profit was made per job, determining how long a trip would take if a car traveled at a given speed, determining cost per person for expenses on a trip). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ single digit _____ ❑ multiple digits
_____ ❑ without remainders _____ ❑ with remainders

Specify method: _____ ❑ mentally _____ ❑ uses a table or chart
_____ ❑ uses counters or tallies _____ ❑ uses an abacus
_____ ❑ uses a calculator _____ ❑ other: _____

3.13. *Use division to solve one-step applied problems. (Mathematics I 72: VII)*

4. Use measurement concepts and tools involving length, weight, and volume to solve problems related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

CL.B.3.Su.2 apply mathematical concepts and processes needed to accomplish functional tasks—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

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Linear Measurement

4.1. Identify the most appropriate units of linear measurement to accomplish functional tasks (e.g., measuring your height, calculating the length of a room, determining the distance on a trip). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ inches _____ ❑ feet _____ ❑ yards _____ ❑ miles
_____ ❑ other: _____

4.2. Identify abbreviations for linear measurement units when completing functional tasks (e.g., reading the distance scale on a map, reading measurements for a room layout). (CL.B.1.In.1, CL.B.1.Su.1)
Specify: _____ ❑ linear—in., ft., yd., mi., m. _____ ❑ area—sq. ft., sq. yd., sq. mi.
_____ ❑ other: _____

4.3. Identify the most appropriate tools and equipment for linear measurement to complete functional tasks (e.g., length of tool, unit of measurement, effective and ineffective uses). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ ruler _____ ❑ tape measure _____ ❑ yard stick
_____ ❑ other: _____

4.4. *Identify ruler, yardstick, and tape measure. (Mathematics F 47: IV)*

4.5. Measure the length, width, or height of object or area accurately using appropriate tools or equipment to accomplish functional tasks (e.g., use a ruler to measure a short line, use a tape measure to measure a room). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ ruler _____ ❑ tape measure _____ ❑ yard stick
_____ ❑ other: _____

4.6. *Determine which of three or more objects is smallest, largest, shortest, or tallest. (Mathematics A 5: IV)*

4.7. *Measure an object to the nearest inch. (Mathematics F 50: V)*

4.8. *Identify the length, width, or height of an object. (Mathematics F 54: VII*)

4.9. Solve problems involving linear measurement to accomplish functional tasks (e.g., determining which rope is longer, determining miles to desired destination, determining the height of a fence, determining the length of a soccer field, determining amount of fabric needed to make curtains). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ no conversion _____ ❑ conversion

4.10. *Solve applied problems involving measurement using addition or subtraction. (Mathematics F 55: VII)*

Volume/Capacity

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4.11. Identify the most appropriate units to measure volume or capacity when completing functional tasks (e.g., preparing a recipe, adding oil to the car, purchasing soft drinks). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ cup _____ ❑ pint _____ ❑ quart
_____ ❑ gallon _____ ❑ liter _____ ❑ teaspoon
_____ ❑ tablespoon _____ ❑ other: _____

4.12. Identify abbreviations for volume or capacity measurement units when completing functional tasks (e.g., reading the ingredients required in a recipe). (CL.B.1.In.1, CL.B.1.Su.1)
Specify: _____ ❑ volume—c., l., tsp., Tbs., gal.
_____ ❑ other: _____

4.13. Identify the most appropriate tools or equipment to measure volume or capacity when completing functional tasks (e.g., dry or liquid ingredients, amount to measure, accuracy). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ measuring cups and spoons _____ ❑ containers marked by volume
_____ ❑ other: _____

4.14. *Demonstrate an understanding of capacity concepts (e.g., least, most, empty, full). (Mathematics A 6: IV)*

4.15. Measure volume or capacity accurately using the appropriate tool or equipment to accomplish functional tasks (e.g., measuring a cup of bleach for the laundry, measuring gas into a tank for a lawnmower, measuring quarts of water for tea, measuring a dose of liquid medicine). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ cup _____ ❑ pint _____ ❑ quart
_____ ❑ gallon _____ ❑ liter _____ ❑ teaspoon
_____ ❑ tablespoon _____ ❑ other: _____

4.16. *Identify a cup, quart, and gallon as tools to measure capacity. (Mathematics F 49: V)*

4.17. *Determine capacity by measuring to the nearest cup, quart, or gallon. (Mathematics F 51: VI)*

4.18. Solve problems involving capacity or volume to accomplish functional tasks (e.g., determining how many glasses can be filled from a 1-liter bottle of soda, getting the right-sized can for a recipe). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ no conversion _____ ❑ conversion _____ ❑ addition

Weight

Life Skills Math: 9-12

4.19. Identify the most appropriate units to measure weight to accomplish functional tasks (e.g., weighing an infant, buying produce). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ ounce _____ ❑ pound
_____ ❑ ton _____ ❑ other: _____

4.20. Identify abbreviations for weight measurement units when completing functional tasks (e.g., recording your weight on a chart, writing a recipe). (CL.B.1.In.1, CL.B.1.Su.1)
Specify: _____ ❑ weight—oz., lb. _____ ❑ other: _____

4.21. Identify the most appropriate tools and equipment used to measure weight when completing functional tasks (e.g., capacity, accuracy, type of readout). (CL.B.3.In.1, CL.B.3.Su.1)
Specify: _____ ❑ bathroom scales _____ ❑ postal scales _____ ❑ produce scales
_____ ❑ other: _____

4.22. Measure weight accurately using the appropriate tool when completing functional tasks (e.g., weighing yourself, weighing tomatoes at the grocery store, determining how much postage to put on a large envelope). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ bathroom scales _____ ❑ postal scales _____ ❑ produce scales
_____ ❑ other: _____

4.23. *Determine weight by measuring to the nearest pound. (Mathematics F 52: VI)*

4.24. Solve problems involving weight (e.g., determining how many pounds of gravel are needed for a walkway, determining how many ounces of cocoa to buy to make hot chocolate for a party). (CL.B.3.In.2, CL.B.3.Su.2)
Specify: _____ ❑ no conversion _____ ❑ conversion

5. Use measurement concepts involving time, temperature, and money to solve problems related to personal life and the workplace.

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

CL.B.3.Su.2 apply mathematical concepts and processes needed to accomplish functional tasks—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

Time

Life Skills Math: 9-12

5.1. Identify the most appropriate units of time to accomplish functional tasks (e.g., making plans for the week, scheduling appointments, predicting the weather). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ seconds, minutes, hours _____ ❑ days, weeks, months, years
_____ ❑ seasons of the year _____ ❑ now, later, future, past
_____ ❑ today, tomorrow _____ ❑ other: _____

5.2. Identify abbreviations for units of time when completing functional tasks (e.g., reading days of the week on a calendar). (CL.B.1.In.1, CL.B.1.Su.1)

Specify: _____ ❑ time—min., hr., wk., mo., yr., Mon., Tues., Dec.
_____ ❑ other: _____

5.3. *Associate activities with morning, afternoon, and night (e.g., eating breakfast, going to bed). (Mathematics G 56: III)*

5.4. *Tell which day of the week comes before and after a given day. (Mathematics G 60: V)*

5.5. *Identify the days of the week. (Mathematics G 58: IV)*

5.6. *Indicate the date by month, day, and year in numerical form (e.g., 5/13/88). (Mathematics G 64: VI)*

5.7. *Distinguish between a.m. and p.m. to describe time of day. (Mathematics G 62: VI)*

5.8. Identify equivalent units of time when accomplishing functional tasks (e.g., determining how many hours to allow for a 30-minute activity, recording time worked on a time sheet). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ 60 seconds = 1 minute _____ ❑ 60 minutes = 1 hour
_____ ❑ 24 hours = 1 day _____ ❑ 7 days = 1 week
_____ ❑ other: _____

5.9. *Identify time equivalencies (e.g., 12 months = 1 year; 60 minutes = 1 hour; 24 hours = 1 day; 30 minutes = half hour, and 1 week = 7 days). (Mathematics G 63: VI)*

5.10. Identify time on a clock to accomplish functional tasks (e.g., timing a runner, setting a VCR to tape a show, counting time to reach a destination). (CL.B.3.In.1, CL.B.3.Su.1)

Specify type of clock: _____ ❑ analog _____ ❑ digital

Specify interval: _____ ❑ hour/half hour _____ ❑ minutes

5.11. *Tell time to the hour. (Mathematics G 57: IV)*

5.12. *Tell time to the hour and half hour. (Mathematics G 59: V)*

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5.13. *Indicate time in hours and minutes using proper notation (e.g., 1:28).* *(Mathematics G 65: VI)*

5.14. Identify the date on a calendar to accomplish functional tasks (e.g., planning a party, scheduling an appointment). (CL.B.3.In.1, CL.B.3.Su.1)

5.15. *Given a date, identify the day of the week on a calendar.* *(Mathematics G 61: V)*

5.16. Determine the elapsed time between events to accomplish functional tasks (e.g., taking medication every four hours, determining when to schedule next appointment, determining how much time is left to finish the test, determining if warranty is still good). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ conversion _____ ❑ no conversion

5.17. Solve problems involving time to accomplish functional tasks (e.g., setting a VCR to tape a television show, determining how long it has been since last dental checkup). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ conversion _____ ❑ no conversion

5.18. *Using addition and subtraction, solve applied problems involving years, months, weeks, days, or hours.* *(Mathematics G 66: VII)*

Temperature

5.19. Identify the most appropriate units to measure temperature to accomplish functional tasks (e.g., understanding the weather report from another country, describing a fever, preparing food, reading a temperature gauge in a freezer). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ degrees Fahrenheit _____ ❑ degrees Celsius

5.20. Identify the meaning of commonly used temperatures to accomplish functional tasks (e.g., reading a thermometer to identify a high fever, determining if the freezer is cold enough to make ice, setting a thermostat in a room). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ freezing and boiling points of water _____ ❑ normal body temperature
_____ ❑ comfortable room temperature _____ ❑ other: _____

5.21. Identify the time and temperature as represented on electronic signs on buildings in the community. (CL.B.1.In.1, CL.B.1.Su.1)

5.22. Identify the most appropriate equipment to measure temperature when completing functional tasks (e.g., purpose, limits, accuracy, type of readout). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ thermometers—weather, oral, cooking
_____ ❑ thermostat—furnace, motor

_____ ❑ other: _____

5.23. *Identify tools to measure temperature (e.g., thermometer, thermostat).* *(Mathematics F 48: IV)*

5.24. Measure temperature accurately using the appropriate tool or equipment to accomplish functional tasks (e.g., using a meat thermometer to determine if a roast is fully cooked, reading the thermostat to find the temperature in a room). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ thermometer—weather, oral, cooking
_____ ❑ thermostat—furnace, car, motor
_____ ❑ other: _____

5.25. *Determine the temperature using Fahrenheit thermometers.* *(Mathematics F 53: VI)*

5.26. Solve problems involving temperature to accomplish functional tasks (e.g., checking the oven's temperature for cooking). (CL.B.3.In.2, CL.B.3.Su.2)

Money

5.27. Identify the names and values of coins and bills to accomplish functional tasks (e.g., counting money, paying for an item, putting correct change into a vending machine, paying for a cab fare). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ to $1.00 _____ ❑ to $5.00 _____ ❑ to $20.00 _____ ❑ to $100.00
_____ ❑ other: _____

5.28. *Identify coins as money.* *(Mathematics E 31: III)*

5.29. *Identify the coins: penny, nickel, dime, and quarter.* *(Mathematics E 32: IV)*

5.30. *Identify the cent (¢) sign and the dollar ($) sign.* *(Mathematics E 33: IV)*

5.31. *Identify the cent value of a penny, a nickel, a dime, a quarter, and the dollar value of bills through $10.* *(Mathematics E 35: V)*

5.32. *Identify money values not to exceed $100 (e.g., $62.43).* *(Mathematics E 42: VI)*

5.33. Count coins and bills to accomplish functional tasks (e.g., rolling pennies to take to a bank, using quarters to pay for a $2.00 item, paying for the bill at a restaurant). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ to $1.00 _____ ❑ to $5.00 _____ ❑ to $20.00 _____ ❑ to $100.00
_____ ❑ other: _____

5.34. Identify common coin combinations to accomplish functional tasks (e.g., paying a toll on a highway, paying bus fare, using pay phones, buying a newspaper from a stand, purchasing gum from a machine, placing money in a parking meter). (CL.B.3.In.1, CL.B.3.Su.1)

Life Skills Math: 9-12

5.35. Determine equivalent amounts of money using coins and paper currency to accomplish functional tasks (e.g., giving change for a dollar, collecting one hundred dollars in small bills). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ to $1.00 _____ ❑ to $5.00 _____ ❑ to $20.00 _____ ❑ to $100.00 _____ ❑ other: _____

5.36. *Determine equivalent amounts using pennies, nickels, dimes, and quarters (not to exceed $1). (Mathematics E 37: V)*

5.37. *Determine equivalent amounts not to exceed $10 using coins and paper currency. (Mathematics E 41: VI)*

5.38. Use numbers and symbols to represent amounts of money to accomplish functional tasks (e.g., adding amounts of money). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ to $1.00 _____ ❑ to $5.00 _____ ❑ to $20.00 _____ ❑ to $100.00 _____ ❑ other: _____

5.39. *Write money values not to exceed $10. (Mathematics E 38: V)*

5.40. Determine the total cost of items to accomplish functional tasks (e.g., determining how much money is needed to purchase the items). (CL.B.3.In.2, CL.B.3.Su.2)

5.41. Compare the cost of two items to accomplish functional tasks (e.g., determining the least expensive brand in a grocery store, determining how much it would cost to buy the name brand). (CL.B.3.In.2, CL.B.3.Su.2)

5.42. *Identify which costs more or less through $5, given the cost of two items. (Mathematics E 36: V)*

Life Skills Math: 9-12

5.43. *Solve applied problems involving comparison shopping. (Mathematics E 46: VII)*

5.44. Calculate correct change to accomplish functional tasks (e.g., verifying change given from a vending machine, counting change as a customer). (CL.B.3.In.2, CL.B.3.Su.2)

Specify: _____ ❑ to $1.00 _____ ❑ to $5.00 _____ ❑ to $10.00
_____ ❑ to $20.00 _____ ❑ to $100.00 _____ ❑ other: _____

5.45. *Determine the change to be received from a $5 bill after a purchase (with a calculator, if needed). (Mathematics E 40: VI)*

6. Demonstrate knowledge of skills and concepts involved in personal money management (e.g., budgets, banking, salaries, credit, taxes).

IF.A.1.In.1 complete productive and leisure activities used in the home and community.

IF.A.1.Su.1 complete productive and leisure activities used in the home and community—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:
___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

6.1. Identify common productive activities involved in managing money and personal finances. (IF.A.1.In.1, IF.A.1.Su.1)

Specify: _____ ❑ preparing and following weekly and monthly budgets
_____ ❑ managing and protecting personal cash
_____ ❑ using checking and savings accounts
_____ ❑ buying goods and services
_____ ❑ paying bills, contributing to charities
_____ ❑ using comparative shopping to make wise purchases
_____ ❑ using a credit, debit, or ATM card
_____ ❑ paying income and other kinds of taxes
_____ ❑ saving and investing money
_____ ❑ buying insurance
_____ ❑ other: _____

6.2. Identify purposes and functions of banks and credit unions (e.g., financial transactions, maintaining a savings account, establishing credit for future loans). (IF.A.2.In.1, IF.A.2.Su.1)

6.3. *Associate the financial institution (e.g., bank, credit union) with money. (Mathematics E 34: IV)*

6.4. *Identify the purposes of a checking and savings account. (Mathematics E 39: V)*

6.5. *Identify which documents to show for proper identification for check cashing. (Mathematics E 43: VI)*

6.6. Use essential knowledge and skills when completing productive activities involving managing money and personal finances. (IF.A.1.In.1, IF.A.1.Su.1)

Specify: _____ ❑ using coins and bills to pay for goods and services
_____ ❑ selecting desired goods and services based on needs and available funds
_____ ❑ evaluating claims in advertisements
_____ ❑ understanding sales tactics used by stores and services—discounts, brand names and generic items, bulk packaging
_____ ❑ entering into long-term contracts and loans
_____ ❑ using ATM and debit cards
_____ ❑ using credit cards or charge accounts
_____ ❑ maintaining checking and savings accounts at a bank or credit union
_____ ❑ other: _____

6.7. Solve problems involving purchases with a discount to accomplish functional tasks (e.g. determining cost if shirt is 30% off, determining cost of an item with a rebate). (CL.B.3.In.2, CL.B.3.Su.2)

6.8. Solve problems involving rate of interest and sales tax to accomplish functional tasks (e.g., interest on a car loan, sales tax). (CL.B.3.In.2, CL.B.3.Su.2)

6.9. *Complete a check and deposit slip and record in check register. (Mathematics E 44: VI)*

6.10. *Complete forms associated with a savings account. (Mathematics E 45: VI)*

7. Use basic concepts of geometry and spatial relationships in situations related to personal life and the workplace (e.g., room layout, use of models, maps).

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

CL.B.3.Su.2 apply mathematical concepts and processes needed to accomplish functional tasks—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

7.1. Identify two-dimensional shapes to accomplish functional tasks (e.g., drawing a circle, identifying stop and yield signs by their shapes, buying a mat for a picture frame, matching the shape of a tablecloth to a table). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ square _____ ❑ rectangle _____ ❑ triangle
_____ ❑ circle _____ ❑ other: _____

Life Skills Math: 9-12

7.2. Identify three-dimensional shapes to accomplish functional tasks (e.g., selecting a tube to package a poster, making a cone for frosting). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ cube _____ ❑ sphere _____ ❑ cylinder _____ ❑ cone
_____ ❑ other: _____

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7.3. Use angles to accomplish functional tasks (e.g., rearranging furniture, laying tiles on a diagonal, folding a napkin in a triangle). (CL.B.3.In.2, CL.B.3.Su.2)

7.4. Use parallel or perpendicular lines to accomplish functional tasks (e.g., aligning two pictures on a wall, drawing a map that shows the intersection of two streets). (CL.B.3.In.2, CL.B.3.Su.2)

7.5. Solve problems involving the perimeter or area of a rectangle or square to accomplish functional tasks (e.g., buying a mat for a photograph, determining the area of a room to purchase carpet). (CL.B.3.In.2, CL.B.3.Su.2)

8. Apply appropriate mathematical problem-solving strategies in situations related to personal life and the workplace (e.g., estimation, rounding, checking for accuracy, using electronic devices).

CL.B.3.In.2	apply mathematical concepts and processes to solve problems.
CL.B.3.Su.2	apply mathematical concepts and processes needed to accomplish functional tasks–with guidance and support.
CL.B.4.In.1	identify problems and examine alternative solutions.
CL.B.4.In.2	implement solutions to problems and evaluate effectiveness.
CL.B.4.Su.1	identify problems found in functional tasks—with guidance and support.
CL.B.4.Su.2	implement solutions to problems found in functional tasks—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

8.1. Estimate the number of objects in a set and compare the estimate with the actual number to accomplish functional tasks (e.g., dishes needed for a dinner party, pencils to distribute to a class, baseballs in a bag to play a game). (CL.B.3.In.2, CL.B.3.Su.2)

8.2. Estimate, by first rounding numbers, the solution to computation problems to accomplish functional tasks (e.g., rounding prices to obtain a subtotal of items before purchasing, estimating how much money is needed to buy gas to fill a gas tank, estimating the hourly rate of speed of a car). (CL.B.3.In.2, CL.B.3.Su.2)

8.3. Estimate the length, width, or height of an object or area to accomplish functional tasks (e.g., estimating the width of a box to see if it can be moved through a door, estimating the height of a chair for a desk, estimating the width and length of a frame for a picture). (CL.B.3.In.2, CL.B.3.Su.2)

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8.4. Estimate the solution to problems involving money to accomplish functional tasks (e.g., estimating the cost of electricity for a year—lights, TV, heater; estimating the total cost of groceries for a week). (CL.B.3.In.2, CL.B.3.Su.2)

8.5. Estimate the solution to problems involving time to accomplish functional tasks (e.g., estimating the time it will take to reach a destination, estimating the amount of time involved in getting ready for work). (CL.B.3.In.2, CL.B.3.Su.2)

8.6. Estimate the solution to problems involving capacity or volume to accomplish functional tasks (e.g., selecting the right size of bowl to use in cooking). (CL.B.3.In.2, CL.B.3.Su.2)

8.7. Estimate the solution to problems involving weight when completing functional tasks (e.g., estimating how much fruit must be purchased, estimating weight of food when dieting, estimating weight that can be lifted when working out). (CL.B.3.In.2, CL.B.3.Su.2)

Solving Mathematical Problems

8.8. Follow a systematic approach when using mathematical concepts and processes to solve problems in accomplishing functional tasks. (CL.B.4.In.1, CL.B.4.In.2, CL.B.4.Su.1, CL.B.4.Su.2)

Specify: _____ ❑ determine nature of the problem
_____ ❑ select correct technique
_____ ❑ make reasonable estimate of results
_____ ❑ apply operation or procedures to obtain result
_____ ❑ check results for accuracy
_____ ❑ explain results
_____ ❑ other: _____

8.9. Determine whether insufficient or extraneous information is given in solving particular mathematical problems (e.g., "Do I have all the information I need?" "What does this information have to do with the problem?"). (CL.B.4.In.1, CL.B.4.Su.1)

8.10. Express mathematical problems using alternative methods to accomplish functional tasks. (CL.B.4.In.2, CL.B.4.Su.2)

Specify: _____ ❑ drawing pictures or diagrams _____ ❑ using concrete objects
_____ ❑ paraphrasing _____ ❑ using models
_____ ❑ other: _____

9. Interpret simple bar graphs and tables in situations related to personal life and the workplace.

Life Skills Math: 9-12

CL.B.3.In.2 apply mathematical concepts and processes to solve problems.

CL.B.3.Su.2 apply mathematical concepts and processes needed to accomplish functional tasks—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

9.1. Identify the meaning of information that is displayed graphically in various forms (e.g., locate the team with the highest scores, locate high temperatures in a weather report). (CL.B.3.In.1, CL.B.3.Su.1)

Specify: _____ ❑ charts _____ ❑ graphs _____❑ tables

9.2. *Obtain information from charts, graphs, and schedules. (Reading F 24: VI)*

9.3. Solve problems using information displayed in charts and tables to accomplish functional tasks (e.g., determining the highest temperature for the week from a bar graph, determining from a pie graph what percentage of time the student spends sleeping). (CL.B.3.In.2, CL.B.3.Su.2)

10. Use calculators and other electronic tools to assist with computation.

CL.C.2.In.2 use appropriate technology and equipment to complete tasks in the workplace.

CL.C.2.Su.2 use appropriate technology and equipment to complete tasks in the workplace—with guidance and support.

Indicate guidance and support necessary for mastery at supported level:

___ physical prompt ___ verbal prompt ___ visual prompt
___ assistive technology ___ supervision ___ other: _____

10.1. Identify the most appropriate electronic tools to use in solving selected mathematical problems (e.g., calculator, adding machine, automatic cash register). (CL.C.2.In.2, CL.C.2.Su.2)

10.2. Identify situations when it is appropriate to use electronic tools to assist with calculations (e.g., balancing checkbook, working as a cashier, making out a budget). (CL.C.2.In.2, CL.C.2.Su.2)

10.3. Demonstrate skills needed to use a calculator correctly. (CL.C.2.In.2, CL.C.2.Su.2)

Specify: _____ ❑ turning on and off
_____ ❑ entering a number

Life Skills Math: 9-12

_____ ❑ entering a function—add, subtract, multiply, divide
_____ ❑ getting a total
_____ ❑ using percent
_____ ❑ clearing the display
_____ ❑ correcting a mistake
_____ ❑ other: _____

10.4. Use a calculator to assist with computation to accomplish functional tasks (e.g., balancing a checkbook, determining purchase price of a 50 percent off sale, determining the average of five grades, determining the tax on a restaurant bill). (CL.C.2.In.2, CL.C.2.Su.2)

10.5. *Use a calculator to perform complex addition computations. (Mathematics C 18: VI)*

10.6. *Use a calculator to perform complex subtraction computations. (Mathematics D 26: VI)*

10.7. *Use a calculator to perform complex division computations. (Mathematics I 73: VII)*

10.8. *Use a calculator to perform complex multiplication computations. (Mathematics H 69: VII)*

Florida

COURSE DESCRIPTION – Intensive Mathematics Grades 9-12

Subject Area:	Mathematics
Course Number:	1200400
Course Title:	Intensive Mathematics
Credit:	Multiple

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to provide remedial instruction and practice in mathematics skills and concepts.

The content should include, but not be limited to, the following:

- mathematics content identified by diagnosis of each student's needs for remedial instruction specified in the academic improvement plan
- test-taking skills and strategies for mathematics

This course shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate for the content and processes of the subject matter.

Course student performance standards must be adopted by the district, and they must reflect appropriate Sunshine State Standards benchmarks.

B. **Special Note.** The course requirements contained in this course description are designed for a one elective-credit course. This course may be repeated by a student for multiple elective credits if, on subsequent offerings, the required level of student proficiency increases.

This remedial course may not be used to meet the graduation requirement for Mathematics.

The instructional strategies used in this course should be designed to provide effective remedial strategies to meet the needs of each student.

Students should be given opportunities for guided, shared, and independent mathematics test-taking practice.

C. **Course Requirements.** No Sunshine State Standards benchmarks are specified in the course requirements for this course description. The course requirements may be aligned with benchmarks for grades 6-8 or 9-12, or a mixture of the two, as appropriate to the needs of students. It is the responsibility of the district to assure that identified benchmarks are consistent with the needs of the students.

After successfully completing this course, the student will:

1. **Achieve appropriate Sunshine State Standards benchmarks for mathematics identified through individual diagnosis of each student's needs for remedial instruction specified in the academic improvement plan.**

2. **Apply test-taking skills and strategies for mathematics in a variety of contexts.**

Florida
COURSE DESCRIPTION – Mathematical Analysis

Subject Area: Mathematics
Course Number: 1201300
Course Title: Mathematical Analysis
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education:

- all students will have access to calculators and computers;
- classroom activities will be student-centered;
- all courses will have increased emphasis on estimation; and
- evaluation will include alternative methods of assessment.

A. Major concepts/content. The purpose of this course is to develop and supplement the understanding of advanced topics below the level of calculus.

The content should include, but not be limited to, the following:

- polynomial and rational functions
- exponential and logarithmic functions
- sequences and series
- mathematical induction
- symbolic logic and set theory
- matrix algebra
- the concept of limits and continuity
- vectors
- probability and statistics

B. Special note. None

C. Course Requirements. After successfully completing this course, the student will:

1. Demonstrate an understanding of the relationship between exponential and logarithmic functions and apply to problem situations.

2. Demonstrate an understanding of mathematical induction, sequences, and series.

3. Demonstrate an understanding of symbolic logic and set theory.

4. Demonstrate an understanding of polynomials and rational functions and their graphs.

5. Apply concepts from matrix algebra to problem situations.

6. Demonstrate an understanding of limits and continuity.

7. Apply vectors to problem solving situations.

8. Demonstrate an understanding of the fundamentals of probability.

9. Understand and apply appropriate measures of central tendency and variability.

Florida

COURSE DESCRIPTION – Pre-Algebra

Subject Area: Mathematics

Course Number: 1200300

Course Title: Pre-Algebra

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to develop the mathematical concepts and processes that can be used to solve a variety of real-world and mathematical problems, with emphasis on strengthening the skills and concepts needed for success in Algebra I.

The content should include, but not be limited to, the following:

- structure and properties of the real number system
- operations with integers and other rational numbers
- varied means for analyzing and expressing patterns, relations, and functions, including verbal and written descriptions, tables, rules, sequences, graphs, and algebraic equations
- coordinate geometry and graphing of linear equations and inequalities
- solution strategies for simple linear equations and inequalities of one variable
- algebraic and coordinate plane graphic solution strategies for linear functions and inequalities

- relationships expressed by ratio, rates, proportion, and percents
- descriptive statistics including measures of central tendency and plotting procedures
- probability of independent and dependent events
- algebraic applications in geometry including angle and similarity relationships, the Pythagorean Theorem, and formulas for measuring area and volume
- introduction to polynomials

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

B. Special Note. None

C. Course Requirements. These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are <u>not</u> required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

Pre-Algebra

2. Demonstrate understanding of number systems.

MA.A.2.4.2 understand and use the real number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. Use estimation in problem solving and computation.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. Demonstrate understanding and application of theories related to numbers.

MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

6. Measure quantities in the real world and use the measures to solve problems.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

Pre-Algebra

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths*.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/ customary).

MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

8. Estimate measurements in real-world problem situations.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

9. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency*, congruency, similarity, *reflections, symmetry, and transformations including flips, slides, turns, enlargements, and rotations.*

10. Use coordinate geometry to locate objects in two-dimensions and to describe objects algebraically.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry.*

MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three-* dimensional figures, including *distance, midpoint*, slope, *parallelism, and perpendicularity.*

11. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

12. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.4.1 represent real-world problem situations using finite graphs, *matrices, sequences, series, and recursive relations.*

MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, *algebraically, and with matrices*.

13. Demonstrate understanding and use the tools of data analysis for managing information.

MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.

MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for *complex* sets of data and determine the most meaningful measure to describe the data.

MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

14. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams *and formulas for permutations and combinations*.

MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

15. Use statistical methods to make inferences and valid arguments about real-world situations.

MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.

Florida
COURSE DESCRIPTION – Pre-Calculus

Subject Area: Mathematics
Course Number: 1202340
Course Title: Pre-Calculus
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education: all students will have access to calculators and computers; classroom activities will be student-centered; all courses will have increased emphasis on estimation; and evaluation will include alternative methods of assessment.

A. **Major concepts/content.** The purpose of this course is to emphasize the study of functions and other skills necessary for the study of calculus.

The content should include, but not be limited to, the following:

- polynomial, rational, exponential, inverse, logarithmic, and circular functions
- sequences and series
- concept of limits
- vectors
- conic sections
- polar coordinate systems
- symbolic logic
- mathematical induction
- matrix algebra

B. **Special note.** Credit in this course precludes credit in Trigonometry/Analytic Geometry.

C. **Course Requirements.** After successfully completing this course, the student will:

1. Demonstrate an understanding of the theory of functions.

2. Demonstrate an understanding of the connection between circular and trigonometric functions and their inverses.

3. Demonstrate an understanding of the trigonometric identities.

4. Demonstrate the ability to apply trigonometry to problem solving situations.

5. Demonstrate the ability to solve a variety of trigonometric (circular) equations.

6. Demonstrate the ability to solve problems using vectors.

7. Demonstrate an understanding of conic sections and loci.

8. Demonstrate an understanding of polynomial and rational functions, their parametric equations and their graphs.

9. Demonstrate an understanding of the relationship between exponential and logarithmic functions and their application to problem situations.

10. Demonstrate an understanding of graphs in the polar coordinate system and their relation to the Cartesian coordinate system.

11. Demonstrate an understanding of mathematical induction and sequence series.

12. Demonstrate an understanding of the concept of limits and its applications.

13. Demonstrate the ability to solve problems using concepts from matrix algebra.

Florida
COURSE DESCRIPTION – Probability and Statistics with Applications

Subject Area: Mathematics
Course Number: 1210300
Course Title: Probability and Statistics with Applications
Credit: 1.0
Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education: all students will have access to calculators and computers; classroom activities will be student-centered; all courses will have increased emphasis on estimation; and evaluation will include alternative methods of assessment.

A. **Major concepts/content.** The purpose of this course is to explore the concepts of probability, elementary statistics, and hypothesis testing.

The content should include, but not be limited to, the following:

- binomial distribution
- combinations and permutations
- concepts of descriptive statistics
- concepts of inferential statistics
- concepts of nonparametric statistics
- correlation and regression
- hypothesis testing
- measures of central tendency
- normal distribution
- randomness
- sampling theory

B. **Special note.** None

C. **Course Requirements.** After successfully completing this course, the student will:

1. Construct and draw inferences from descriptive statistical displays.

2. Understand and apply measures of central tendency, variability, and correlation regression for data interpretation and prediction.

3. Understand and apply concepts of sampling, randomness and distribution in designing or judging valid statistical experiments.

4. Demonstrate an understanding of experimental probability, theoretical probability and discrete probability distributions.

5. Analyze and interpret the design of an experiment (hypothesis building, sampling, data collection, data analysis for hypothesis testing).

6. Demonstrate an understanding of when to use specific statistical techniques for valid problem solving outcomes.

Florida

COURSE DESCRIPTION - Trigonometry

Subject Area: Mathematics

Course Number: 1211300

Course Title: Trigonometry

Credit**:** .5

Will meet graduation requirements for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

A. Major Concepts/Content. The purpose of this course is to study circular and trigonometric functions and their applications.

The content will include, but not be limited to, the following:

- circular and trigonometric functions and their inverses
- trigonometric identities
- graphs of trigonometric functions and their inverses
- trigonometric equations
- solutions of right and oblique triangles
- trigonometric form of complex numbers

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the subject matter.

B. **Special Note.** Students earning credit in Pre-Calculus may not earn credit in both Trigonometry and Analytic Geometry.

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. Some requirements in this advanced mathematics course are not addressed in the Sunshine State Standards, and some of the cited benchmarks are prerequisite to the course requirement.

After successfully completing this course, the student will:

1. Demonstrate an understanding of the connection between trigonometric and circular functions and their inverses.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc lengths.

MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.

2. Demonstrate an understanding of trigonometric identities.

MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.

MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

3. Apply general graphing techniques to trigonometric functions and their inverses.

MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.

MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc lengths.

MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.

MA.D.1.4.2 determine the impact when changing parameters of given functions.

4. Solve a variety of trigonometric equations.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. Apply trigonometry to problem-solving situations involving triangles.

MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

MA.A.5.4.1 apply special number relationships such as sequences and series to real-world problems.

MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.

MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.

Trigonometry

6. Demonstrate understanding of the connection between trigonometric functions, polar coordinates, and complex numbers.

MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, and complex numbers.

MA.A.1.4.3 understand concrete and symbolic representations of real and complex numbers in real-world situations.

MA.A.2.4.3 understand the structure of the complex number system.

Appendix B
Requirements for
Braille Textbook Production

INSTRUCTIONS FOR PREPARING COMPUTER DISKETTES REQUIRED FOR AUTOMATED BRAILLE TEXTBOOK PRODUCTION

STATUTORY AUTHORIZATION

Section 233.0561(5), Florida Statutes, states that, "...any publisher of a textbook adopted pursuant to the state instructional materials adoption process shall furnish the Department of Education with a computer file in an electronic format specified by the Department at least 2 years in advance that is readily translatable to Braille and can be used for large print or speech access. Any textbook reproduced pursuant to the provisions of this subsection shall be purchased at a price equal to the price paid for the textbook as adopted. The Department of Education shall not reproduce textbooks obtained pursuant to this subsection in any manner that would generate revenues for the department from the use of such computer files or that would preclude the rightful payment of fees to the publisher for use of all or some portion of the textbook."

OBJECTIVE

Electronic text (etext) is needed to accelerate the production of textbooks in Braille and other accessible formats through the use of translation software. Some embedded publisher formatting commands help speed the conversion of English text to Braille or other accessible formats. Therefore, the objective of these instructions is to prompt publishers to provide textbook data in a format that will be useful to Braille and other accessible format producers while at the same time allowing each publisher the flexibility of using existing composition or typesetting systems. Publishers may produce etext files in one of three formats, as shown in the specifications below.

By April 1, 1998, publishers of adopted student textbooks for literary subjects must be able to provide the computer diskettes **UPON REQUEST**. Publishers shall provide nonliterary subjects when technology becomes available for the conversion of nonliterary materials to the appropriate format.

The requested computer diskettes shall be provided to the Florida Instructional Materials Center for the Visually Impaired (FIMC), 5002 North Lois Avenue, Tampa, Florida 33614; (813) 872-5281; in Florida WATS (800) 282-9193 or (813) 872-5284 (FAX). The center will contact each publisher of an adopted textbook and provide delivery instructions.

SPECIFICATIONS

FORMAT (Three Options):	a. A full implementation of Standard Generalized Markup Language (SGML). b. XML-Extensible Markup Language c. ASCII – (Last Resort!)
2. OPERATING SYSTEM:	Windows
3. DISKETTE SIZE:	3.5, CD, Zip100
4. DISKETTE CAPACITY:	Double-sided/high density
5. DISKETTE LABELING:	a. Sequential Number/ISBN b. Book Title c. File Name d. Name of Publisher e. Name of Typesetting Company/Contact Name f. Format Option and Version g. Copyright Date h. Wording such as: "All rights reserved. As described in Chapter 233.0561(5), Florida Statutes, no use may be made of these diskettes other than the creating of a Braille, Large Print, or Recorded version of the materials contained on this diskette for students with visual impairments in the State of Florida."
6. REQUIRED CONTENTS:	a. Title Page b. List of Consultants and Reviewers (if appropriate) c. Table of Contents d. All Textbook Chapters e. All Appendices f. All Glossaries g. Indices
7. FILE STRUCTURE:	Each chapter of a textbook will be formatted as a separate file.
8. FILE LIST:	A separate file listing the structure of the primary files must be provided. This file should be labeled DISKLIST TEXT. In addition, all special instructions (e.g., merging of materials kept in a separate file) should be noted in this file.
9. LOCATION OF SPECIAL DATA	Marginal notes, footnotes, captions, and other special items must be placed consistently within each text file.
10. CORRECTIONS AND CHANGES	A conscientious effort should be made to update files to exactly duplicate the adopted printed version of the textbook (including corrections and changes). If this cannot be accomplished in a timely and cost effective manner, the publisher will coordinate with the FIMC Supervisor and provide to the Supervisor one set of marked tearsheets of all corrections and changes not included in the files.