Instructional Materials Administrator

Recommendation

Yes

Comments: This is a well-known and well-written high school biology textbook that explains all of the major facets of modern biology in an engaging and informative way. I particularly liked the illustrations and diagrams, and the data analysis exercises that accompany every chapter. I teach college-level biology using a text that goes the same topics but in much more detail. If the high school teachers use this text to prep future college students, my job will be so much easier.

Material for Review

Course: Biology 1 (2000310)
Title: Pearson Miller & Levine Biology, Florida Edition , Edition: 1st
Copyright: 2019
Author: Miller & Levine
Grade Level: 9 - 12

Content

Answer each item below and select the "Save" button to save your responses. You must select the "Save" button before going to another section or leaving this page to save the answers you have provided. If you are unable to complete the section, you may save your answers and come back to complete at a later time. All items must be answered for a section to be considered complete.
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To answer each item, select the appropriate rating from the following scale:

5 - VERY GOOD ALIGNMENT
4 - GOOD ALIGNMENT
3 - FAIR ALIGNMENT
2 - POOR ALIGNMENT
1 - VERY POOR/NO ALIGNMENT

Upon completion of all Areas of Review, the Recommendation link will become available with a record of how you scored each section of the evaluation.

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- Additional information regarding the Content, Presentation, and Learning requirements are located in the Science K-12 Specifications for the 2017-18 Florida State Adoption of Instructional Materials.

Each set of materials submitted for adoption is evaluated based on each benchmark for that course and the Content, Presentation, and Learning items included in this rubric.

A. Alignment with curriculum1. A. The content aligns with the state's standards and benchmarks for subject, grade level and learning outcomes.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
I have reviewed all of the links provided by the publisher to the sections of the text that correspond to each of the Florida 9-12 Biology standards, and found that the content of this textbook does indeed align with the standards as written.

2. A. The content is written to the correct skill level of the standards and benchmarks in the course.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The authors of this text have conscientiously minimized technical jargon while still making the scientific material presented understandable.

3. A. The materials are adaptable and useful for classroom instruction.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Each chapter is organized into Lessons that average 5-6 pages in length, which is long enough to described the essential information for each topic, but short enough that students can read it in class. A list of relevant vocabulary words is given at the beginning of each lesson. Review questions are given at the end of every lesson, as well as at the end of each chapter.

B. Level of Treatment4. B. The materials provide sufficient details for students to understand the significance of topics and events.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Yes, the materials provide sufficient details for the students to understand the significance of the topics being discussed. For example, the diagrams and illustrations that accompany the text are excellent, and are very helpful at explaining complicated processes like cell respiration, photosynthesis, DNA replication, mRNA transcription, and protein translation.

5. B. The level (complexity or difficulty) of the treatment of content matches the standards.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
See answer to 1A above

6. B. The level (complexity or difficulty) of the treatment of content matches the student abilities and grade level.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
See answer to 2A above

7. B. The level (complexity or difficulty) of the treatment of content matches the time period allowed for teaching.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
In my opinion, biology textbooks at both the high school (and college level) encompass way more information than can reasonably be covered in a single school year (or two semesters).

C. Expertise for Content Development8. C. The primary and secondary sources cited in the materials reflect expert information for the subject.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Yes. For example, on p. 641-643 the text discusses Tiktaalik, and important Devonian-aged fossil sarcopterygian fossil fish that shows several of the significant characters of tetrapods that were important in the transition to terrestrial habitats. Neil Shubin (University of Chicago) has written a book called “Your Inner Fish” which describes the discovery of this fossil and its evolutionary significance.

9. C. The primary and secondary sources contribute to the quality of the content in the materials.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Yes, indeed

D. Accuracy of Content10. D. The content is presented accurately. (Material should be devoid of typographical or visual errors).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Yes, I did not notice any errors in the text.

11. D. The content of the material is presented objectively. (Material should be free of bias and contradictions and is noninflammatory in nature).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Yes, all material covered in this textbook is presented objectively. For example, the causes and effects of global climate change are described on pages 206-214. The manner in which the material is presented is very straightforward and accompanied by graphs and charts from reputable scientific sources.

12. D. The content of the material is representative of the discipline? (Material should include prevailing theories, concepts, standards, and models used with the subject area).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Yes, the content of the material is representative of the various disciplines covered. For example, on pages 670-671, there is a lesson on “Evaluating the evidence from the K-T boundary” that has the students examine current scientific evidence related to the mass extinction that occurred at the end of the Cretaceous (about 65 million years ago).

13. D. The content of the material is factual accurate. (Materials should be free of mistakes and inconsistencies).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Yes, the content of the material is accurate.

E. Currency of Content14. E. The content is up-to-date according to current research and standards of practice.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Yes, the content is up-to-date according to current research. For example, all of the cladograms used to portray the evolutionary relationships of various plant and animal groups are up-to-date and show the currently used names for the major groups of organisms. In particular, the Diversity of Life Handbook (End Matter) does a great job of covering the different taxonomic groups on the Tree of Life. Each group (clade) is accompanied by an illustration and a brief description summarizing the major characteristics of the group. And, each clade is referenced to a cladogram that shows its relationship to other closely related taxa.

15. E. The content is presented to the curriculum, standards, and benchmarks in an appropriate and relevant context.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Yes, I have reviewed all of the links provided by the publisher to the sections of the text that correspond to each of the Florida 9-12 Biology standards, and found that the content is presented in an appropriate and relevant context.

16. E. The content is presented in an appropriate and relevant context for the intended learners.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Yes, the authors of this text take care to make the material interesting to high school students.

F. Authenticity of Content17. F. The content includes connections to life in a context that is meaningful to students.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Yes, this text does an excellent job at including material that is relevant and meaningful to students in Florida. For example, on p. 761, the case study on “How can we save the crops we depend on?” brings up some of the issues that currently impact citrus agriculture in Florida.

18. F. The material includes interdisciplinary connections which are intended to make the content meaningful to students.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Yes, this text does an excellent job at including 2-page “articles” that describe how biology is applied to solving a variety of problems in different fields. For example, at the beginning of the book there is a section that discusses how hydroponic vegetables are grown in the International Space Station, and at the McMurdo research station in Antarctica.

G. Multicultural Representation19. G. The portrayal of gender, ethnicity, age, work situations, cultural, religious, physical, and various social groups are fair and unbiased. (Please explain any unfair or biased portrayals in the comments section).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
This text does an excellent job at portraying diversity in the photos that accompany the text. For example, p. 529 includes an inset that describes the contributions of George Washington Carver to agriculture and botany that is accompanied by a photo of GWC working in the laboratory. Another example is the photo of Dr. Maria Cavazzari who lead a team that discovered a gene therapy treatment for sickle cell anemia.The images in the book also do a good job at portraying biology as a cooperative endeavor.

H. Humanity and Compassion20. H. The materials portray people and animals with compassion, sympathy, and consideration of their needs and values and exclude hard-core pornography and inhumane treatment. (An exception may be necessary for units covering animal welfare).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
All of the images of people and animals in this book depict individuals who are healthy and happy, and not being harmed in any way. There are not any pornographic images in this textbook.

21. In general, is the content of the benchmarks and standards for this course covered in the material.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Yes, see section on standards for specific details.

Presentation

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A. Comprehensiveness of Student and Teacher Resources1. A. The comprehensiveness of the student resources address the targeted learning outcomes without requiring the teacher to prepare additional teaching materials for the course.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
In my opinion, all teachers should be on the look out for additional teaching materials no matter how good these resources are.

B. Alignment of Instructional Components2. B. All components of the major tool align with the curriculum and each other.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
Yes

C. Organization of Instructional Materials3. C. The materials are consistent and logical organization of the content for the subject area.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
The topics covered in this text book closely follow the organization of these same topics in most college-level text books.

D. Readability of Instructional Materials4. D. Narrative and visuals engage students in reading or listening as well as in understanding of the content at a level appropriate to the students' abilities.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
The language used in this text is very easy to understand and follow. The accompanying diagrams and illustrations are excellent. For example, Fig. 23-1 (Principal Organs of Plants) is an Illustration of a plant with callouts showing cross-sections of leaf, stem and roots.

E. Pacing of Content5. E. 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.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
Yes, each of the lessons included in the chapters averages 5-6 pages in length, which includes the illustrations and diagrams. So, it should be easy for students to read a few pages at a time without getting overwhelmed by the amount of material being covered.

Accessibility6. The material contains presentation, navigation, study tool and assistive supports that aid students, including those with disabilities, to access and interact with the material. (For assistance refer to the answers on the UDL questionnaire).

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
The text has links to videos and other content which should make it easier for students with disabilities to learn the material in different ways.

7. In general, how well does the submission satisfy PRESENTATION requirements? (The comments should support your responses to the questions in the Presentation section).

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
I enjoyed reading this text book, even though I spend an a lot of amount of time reading college-level biology text books. As mentioned

above, the lessons are short enough to read in a relatively brief amount of time, yet detailed enough to describe the topic being presented.

Learning

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A. Motivational Strategies 1. A. Instructional materials include features to maintain learner motivation.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
This text book uses a number of very interesting case studies to make the topics being covered relevant to the students. The photos, diagrams and illustrations that accompany the text are colorful, visually appealing and very easy to interpret. The figure captions that accompany the illustrations and diagrams not only describe the image, but frequently ask the students questions about the diagram. There are links throughout the text to online videos, hands-on labs, and exercises in the workbook.

B. Teaching a Few "Big Ideas" 2. B. Instructional materials thoroughly teach a few important ideas, concepts, or themes.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
Yes, the text is organized into 6 units: the nature of biology, ecology, cells, genetics, evolution, and diversity of life. Each unit is divided into 2-7 chapters for a total of 27 chapters. The text also delimits 10 major themes and methods of study (referred to as “crosscutting concepts in biology”), which the authors interweave into the each of the chapters to show the connectedness and interdisciplinary nature of the biological sciences. Questions on the relevant crosscutting concepts are included at the end of the chapter assessments which appear at the end of each chapter.

C. Explicit Instruction 3. C. The materials contain clear statements of information and outcomes.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
Each Lesson begins with a list of Key Questions that the students should be able to answer after they complete the reading. There is also a list of vocabulary words, the definitions of which are essential to understanding the information presented in the text. There are a series of brief Review Questions at the end of the chapter, a Lesson Review/Study Guide at the end of each chapter. The Study Guide summarizes the major concepts presented in each chapter, lists the relevant vocabulary words, and asks the students to answer a question or interpret a diagram related to the topic of the subsection. These are all separate from the Assessment questions and Florida End-of-Course Test Practice at the end of each chapter.

D. Guidance and Support 4. D. The materials provide guidance and support to help students safely and successfully become more independent learners and thinkers.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
In each lesson, there are links to activities in the Biology Foundations workbook. I particularly like the Analyzing Data exercises which help the students interpret patterns and trends in real data examples. The Interactivity boxes ask the students to think about and investigate questions/topics that related to material being presented. For example, on p. 657, the Interactivity box asks the students to “Build and analyze cladograms to determine evolutionary relationships between bats and birds.” This activity provides another example of convergent evolution (in bats vs. birds), and parallels the methodology used in the cladogram illustrating convergent evolution in marine mammals (cetaceans vs. sirenians).

5. D. Guidance and support must be adaptable to developmental differences and various learning styles.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The Teacher's Edition includes strategies for "differential instruction" at the bottom of many of the pages in the text. These strategies include suggestions for helping: struggling students, less proficient readers, special needs students, advanced students, and ESOL students. The book also frequently uses Visual Analogies to illustrate complex processes by reference to more concrete examples. For example, Fig. 4-4 illustrates the differences between decomposers and primary producers as machines that either break down Lego constructions into the individual blocks (decomposers), or assemble individual Lego blocks into complex constructions (primary producers). The Lego blocks are analogous to the basic building blocks (e.g., monomers) of macromolecules.

E. Active Participation of Students6. E. The materials engage the physical and mental activity of students during the learning process.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The instructional materials engage the physical and mental activity of the students in several ways, including: Quick Labs, Developing Solutions, and links to animations and videos. For example, the Quick Labs include simple hands-on activities that complement the information presented in the text. The Quick Lab on p. 208 (How Does Acid Affect Shells?), has the students simulate the dissolution of calcite during ocean acidification by dissolving eggs shells in a vinegar solution. The Quick Lab on p. 323 (Rise Up), has the students examine the production of carbon dioxide gas during fermentation using yeast, sugar, and water in flasks with attached balloons to collect the gas produced during the process. Other activities, such as the Developing Solutions in the chapter on photosynthesis, has the students examine growth of plants under different wavelengths (colors) of light in an online simulation.

7. E. Rate how well the materials include organized activities that are logical extensions of content, goals, and objectives.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Many of the activities described above and below are logical extension of the content, goals and objectives of teaching introductory biology at the high school level. The Analyzing Data and the Quick Labs have the students apply the knowledge that they gain through reading to data analysis or lab exercises.

F. Targeted Instructional Strategies8. F. Instructional materials include the strategies known to be successful for teaching the learning outcomes targeted in the curriculum requirements.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The Teacher Edition of the text includes a number of different instructional strategies to help students learn the material presented. Some of these include having: the students construct models (e.g., of isotopes with beads on p. 44); the teacher carry out demonstrations (e.g., compare the properties of water, H2O to hydrogen peroxide, H2O2); the students create cause and effect diagrams (e.g., relating the properties of water to H-bonds), concept maps (e.g., macromolecules) and flowcharts (e.g., to deconstruct protein structure), and the teacher assign Think-Pair-Share activities (e.g, to understand chemical properties, pH, protein structure, etc.).

9. F. The instructional strategies incorporated in the materials are effective in teaching the targeted outcomes.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The strategies outlined above are all known to be effective teaching tools.

G. Targeted Assessment Strategies10. G. The materials correlate assessment strategies to the desired learning outcomes.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Assessments are integrated throughout the text. There are Reading Checks at the bottom of about every other page that ask the student to: use an analogy for a process, identify a structure, compare two processes or structures, summarize a concept, define a term, explain a process or identify the cause and effect of a process. At the end of every lesson (subsections of the chapters), is a Lesson Review that includes 2-4 questions on the key ideas and concepts presented in the lesson, and 2-4 critical thinking questions. In the Teacher Edition of the textbook, the DOK levels are noted for all of the answers to the assessments, the Reading Checks and the Lesson Reviews. Critical thinking questions are associated with the desired skill as specified in the science standards (integrate information, interpret visuals, construct an explanation, plan an investigation, etc.). The end-of-the-chapter assessments also incorporate questions that are connected to the math and language arts standard. In addition, each chapter ends with sample practice questions for the Florida End-of-Course assessment.

11. G. the assessment strategies incorporated in the materials are effective in assessing the learners' performance with regard to the targeted outcomes.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The assessment strategies outlined above are all known to be effective teaching tools.

Universal Design for Learning12. This submission incorporates strategies, materials, activities, etc., that consider the needs of all students.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The Teacher's Edition includes strategies for "differential instruction" at the bottom of many of the pages in the text. These strategies include suggestions for helping: struggling students, less proficient readers, special needs students, and advanced students. For example, it is suggested that the teacher help struggling readers by referencing the detailed diagrams of the various biogeochemical cycles (p. 124). There are also links to online videos that can supplement the teaching of specific content. For example, there is a link to an HHMI video on

the water cycle at the Gorongosa National Park in Mozambique (http://www.hhmi.org/biointeractive/gorongosas-water-cycle) which can be viewed after reading about the water cycle in the text.

Mathematical Practice13. Do you observe the appropriate application of Mathematical Practices (MP) as applicable?

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
Yes. Throughout the text, there are inset boxes entitled “Analyzing Data,” that present various types of quantitative activities (graphs, data tables, etc.) based on real research studies. These activities ask the students basic questions about the data presented, in order to develop their abilities to interpret visual presentation of data. For example, the graph on p. 155 shows the decline in the monarch butterfly populations that overwinter in Mexico between the years 1995-2015. Students are asked to describe the trend, look for cyclical patterns, and think about the factors that could be causing the observed decline. Another example is the table on p. 887 that lists the gestational periods and weights of the females for various mammals (mouse, rabbit, goat, chimp, human, bison, elephant) and asks the students to compare the gestation of humans to other mammals, interpret the trend of the data, and come up with potential explanations for the observed trend. “Math Connections” are included at the end of each chapter assessment. These include questions/activities which as the students to interpret/analyze data, perform calculations, use models, and employ quantitative reasoning. For example, at the end of Chapter 12 (Introduction to Genetics), students are asked to interpret the results of a monohybrid cross for eye color in fruit flies, by calculating the ratio of the trait in the offspring, determine the mode of inheritance (dominant vs. recessive genes), and draw a Punnett square to work out the expected ratios. There are also supplementary sections in the End Matter that review basic concepts of analyzing and interpreting data, and mathematics and computational thinking.

14. In general, does the submission satisfy LEARNING requirements? (The comments should support your responses to the questions in the Learning section.)

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
See above comments

Standards

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When looking at standards alignment reviewers should consider not only the robustness of the standard coverage but also the content complexity (depth of knowledge level) if appropriate. More information on content complexity as it relates to Florida standards can be found at: http://www.cpalms.org/Uploads/docs/CPALMS/initiatives/contentcomplexity/CPALMS_ccdefinitions_140711.pdf
For example, if the standard is marked as a level 3 (strategic reasoning and complex thinking) then the materials coverage should reflect this. If the materials coverage is only sufficient to allow for recall (level 1) then this should be reflected in the points assigned.

1. **SC.912.E.7.1:** Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.

Remarks/Examples:
Describe that the Earth system contains fixed amounts of each stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e., nitrogen, water, carbon, oxygen and phosphorus), which are driven by energy from within the Earth and from the Sun.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
The biogeochemical cycles of water, carbon, nitrogen, and phosphorus are described in detail in pp. 123-129. Real-world connections are made for all of these cycles, including the impact of the algal blooms and eutrophication in Lake Okeechobee in 2016.

2. **SC.912.L.14.1:** Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science.

Remarks/Examples:
Describe how continuous investigations and/or new scientific information influenced the development of the cell theory. Recognize the contributions of scientists in the development of the cell theory.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
• The text has a nice introduction to the historical development and how it is related to technological innovations (lenses and microscopes) on pp. 242-243. The persons mentioned in the historical introduction include: Hooke, Leeuwenhoek, Schlieden & Schwann, and Virchow. The 3 main components are succinctly summarized, and there is a Quick Lab that asks students to examine cells under the microscope. Later in the test (pp. 904), cells as the building blocks of tissues are discussed.

3. **SC.912.L.14.2:** Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The text does a good job of discussing the structure and function of cell boundaries, including the plasma (cell) membrane and the cell wall of plants on pp. 256-265. The fluid-mosaic model of the plasma membrane is discussed and illustrated (Fig. 8-14), although I disagree with the authors' decision to not use the term "phospholipid" to describe the membrane bilayer. They use the term "lipid bilayer" and illustrate a phospholipid molecule, designating it as a "lipid" molecule with a hydrophilic head and hydrophobic tails. The selective permeability of the cell membrane is reviewed, including diffusion and osmosis, and the fundamental concepts of passive and active transport across the cell membrane. Fig. 8-18 has an illustration of aquaporins (water channels). On pp. 338-340, the relationship between the surface area to volume ratio and cell growth is discussed, and illustrated (Fig. 11-1). On p. 340, the authors' illustrate this concept (SA:V ratio) with a visual analogy of traffic problems in the city. I'm not sure that this analogy is explained well enough since the analogy focuses on traffic problems with growth, and not issues with boundaries (and perhaps limited access in and out of the city via bridges or roads) as city grows.

4. **SC.912.L.14.3:** Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.

Remarks/Examples:
Annually Assessed on Biology EOC. Also assesses SC.912.L.14.2.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Very general differences between cells of prokaryotes and eukaryotes (size, nucleus & organelles) are discussed on pp. 246-247 without mentioning the groups that possess these types of cell organization are discussed; however, on p. 690 is a section that defines prokaryotes as "Bacteria or Archaea—two of the three domains of life." A visual summary showing a typical prokaryotic cell, a generalized animal cell, and a plant cell, are accompanied by a table that shows the presence/absence of various structures (and their functions) for these 3 types of cells. Personally, I think the emphasis on the differences between plant and animal cells is a relict of how biology was taught in the 1880s; for example, fungi were classified as plants since they didn't move.

5. **SC.912.L.14.4:** Compare and contrast structure and function of various types of microscopes.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Early microscopes are briefly discussed on p. 242, and more detailed descriptions of compound light microscopes, including fluorescent microscopes; electron microscopes (TEM & SEM) are presented on pp. 244-245. Fig. 8-2 shows micrograph of a fluorescently dyed cell; fig. 8-3 shows micrographs using difference types of microscopes.

6. **SC.912.L.14.6:** Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Human genetic disorders are discussed on pp. 481-484 (chromosomal disorders (nondisjunction, Down syndrome, Turner's syndrome & Klinefelter's syndrome), as well as the genetic components of cystic fibrosis and Huntington's disease. The relationship between the CF allele and typhoid in medieval Europe is briefly mentioned on. p. 484, and the relationship between sickle cell disease and the occurrence of malaria in Europe, Africa, Middle East is discussed and illustrated. Fig. 21-6 is a table of common human viral diseases: common cold, influenza, AIDS (HIV), hepatitis B, West Nile virus, Ebola, Zika. Fig. 21-14 is a table of some human bacterial diseases: Lyme disease, tetanus, tuberculosis, bacterial meningitis, strep throat. Mutagens that cause disease in humans are discussed on p. 460: chemical mutagens (tobacco smoke and environmental pollutants), and physical mutagens (UV damage), and DNA repair.

7. **SC.912.L.14.7:** Relate the structure of each of the major plant organs and tissues to physiological processes.

Remarks/Examples:
Annually Assessed on Biology EOC.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The text includes sections A brief intro to gymnosperms and angiosperms is given on p. 734, accompanied by illustrations summarizing some of the major differences between the reproductive structures of gymnosperms and angiosperms. The text includes sections that review major plant structures, such as roots, stems and leaves (p. 762-765), accompanied by illustrations of vascular tissue (Fig. 23-2), apical meristems (Fig. 23-3), root systems (Fig. 23-4), and the anatomy of a root (Fig. 23-5). Fig. 22-19, on p. 739 has a table that

summarizes the differences in seeds, leaves, flowers, stems and roots of monocots vs. dicots. Fig. 23-8 compares monocot and dicot stems. The anatomy of leaves is discussed and illustrated at the tissue level, including the role of stomata in regulating gas exchange. Transpiration is discussed and illustrated with a visual analogy showing clowns connected by a rope going over a ladder. There is a Quick Lab on p. 774 that asks the students to investigate the role of leaves in transpiration using an experiment using celery stalks.

8. **SC.912.L.14.26:** Identify the major parts of the brain on diagrams or models.

Remarks/Examples:

Annually Assessed on Biology EOC.

Florida Standards Connections: MAFS.K12.MP.4: Model with mathematics.

◉ **VERY GOOD ALIGNMENT** ○ GOOD ALIGNMENT ○ FAIR ALIGNMENT ○ POOR ALIGNMENT ○ VERY POOR/NO ALIGNMENT

Justification:
Fig. 23-2 (p. 873) is a comparative diagram showing the major regions of the brain (olfactory bulb, cerebrum, optic lobe, cerebellum, medulla oblongata, spinal cord) in bony fish, amphibians, reptiles, birds, and mammals. The figure caption points out the increase in size and complexity of cerebrum in birds and mammals. Discussion brain components is brought up in sections on the nervous system (pp. 925, 947), and the endocrine system (p. 930).

9. **SC.912.L.14.36:** Describe the factors affecting blood flow through the cardiovascular system.

◉ **VERY GOOD ALIGNMENT** ○ GOOD ALIGNMENT ○ FAIR ALIGNMENT ○ POOR ALIGNMENT ○ VERY POOR/NO ALIGNMENT

Justification:
The circulatory system is reviewed on pp. 915-918. There are detailed illustrations of the heart (Fig. 27-9), circulation (Fig. 27-10), and blood vessels (Fig. 27-11).

10. **SC.912.L.14.52:** Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics.

Remarks/Examples:

Annually Assessed on Biology EOC. Also assesses SC.912.L.14.6 HE.912.C.1.7 and HE.912.C.1.5.

◉ **VERY GOOD ALIGNMENT** ○ GOOD ALIGNMENT ○ FAIR ALIGNMENT ○ POOR ALIGNMENT ○ VERY POOR/NO ALIGNMENT

Justification:
The immune system in humans is review on pp. 938-941. Topics discussed are: antigens, humoral immunity, and cell-mediated immunity. There is a graph and activity evaluating the effectiveness of the polio vaccine on the spread of polio. The text also briefly mentions how vaccines “stimulate the body’s immune system to recognize ad destroy such viruses before they can cause disease” (p. 687), and mentions that the Europeans carried diseases that devastated the Native American that did not have immunity to these diseases (e.g, small pox) (p. 681).

11. **SC.912.L.15.1:** Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change.

Remarks/Examples:

Annually Assessed on Biology EOC. Also assesses SC.912.L.15.10 SC.912.N.1.3 SC.912.N.1.4 SC.912.N.1.6 SC.912.N.2.1 SC.912.N.3.1 and SC.912.N.3.4.

◉ **VERY GOOD ALIGNMENT** ○ GOOD ALIGNMENT ○ FAIR ALIGNMENT ○ POOR ALIGNMENT ○ VERY POOR/NO ALIGNMENT

Justification:
The text does an good job of discussing evidences of evolution from the following fields: biogeography (e.g., evolution/adaptive radiation of finch species in the Galapagos archipelago in Fig. 17-12; evolution of similar adaptations in grass-dwelling birds on different continents); paleontology (e.g., evolution of whales and birds in Fig. 17-14; discovery of and importance of fossils of Tiktaalik); comparative anatomy (e.g., comparison of human and gorilla skeletons); comparative embryology (e.g., comparison of homologous bones in forelimbs of frog, alligator, chicken and horse in Fig. 17-15), molecular biology (e.g., molecular homology in Hox genes), and observed genetic change (e.g., change in beak dimensions of finches in Galapagos during drought conditions; anoles on Caribbean islands).

12. **SC.912.L.15.4:** Describe how and why organisms are hierarchically classified and based on evolutionary relationships.

◉ **VERY GOOD ALIGNMENT** ○ GOOD ALIGNMENT ○ FAIR ALIGNMENT ○ POOR ALIGNMENT ○ VERY POOR/NO ALIGNMENT

Justification:
The text does a good job of describing both Linnean rank-based classification (pp. 614-615) and modern classifications that are based on evolutionary relationships (pp. 619, 626-629). Cladograms that depict the evolutionary relationships of the different groups are presented in most of the sections on biodiversity (see the DOL section in the End Matter.

13. **SC.912.L.15.5:** Explain the reasons for changes in how organisms are classified.

◉ **VERY GOOD ALIGNMENT** ○ GOOD ALIGNMENT ○ FAIR ALIGNMENT ○ POOR ALIGNMENT ○ VERY POOR/NO ALIGNMENT

Justification:
The text briefly explains how molecular genetics has been used to generate trees of the evolutionary relationships of living organisms based on similarities in the DNA sequences of various genes (pp. 624-625). There is an entire section on the Tree of Life at the end on the text in the End Matter that presents an up-to-date phylogenies (evolutionary trees) for all of the major groups of living organisms.

14. **SC.912.L.15.6:** Discuss distinguishing characteristics of the domains and kingdoms of living organisms.

Remarks/Examples:

Annually Assessed on Biology EOC. Also assesses SC.912.L.15.4 SC.912.L.15.5 SC.912.N.1.3 and SC.912.N.1.6.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The distinguishing characteristics of Bacteria, Archaea, and Eukarya are discussed on pp. 626-629, 689-690, and DOL-4-DOL-60. The 6-kingdom classification of life is no longer utilized any more, except in some high school text books. This text discusses that classification scheme in a historical context on pp. 616-617. In most cases, the term “kingdom” is not used except for the sections on Linnean classification. The Diversity of Life Handbook does an exceptional job at discussing the diagnostic traits and evolutionary traits of the major clades (monophyletic groups) of organisms. Each clade discussed is accompanied by color photos of representative taxa, and discussion of the major subclades.

15. **SC.912.L.15.8:** Describe the scientific explanations of the origin of life on Earth.

Remarks/Examples:

Annually assessed on Biology EOC. Also assesses SC.912.N.1.3, SC.912.N.1.4, and SC.912.N.2.1.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
he textbook summarizes many of the major ideas on the origin of life on an ancient Earth, including the Miller-Urey experiment (showed that organic molecules could be created under inorganic conditions on an ancient Earth), the RNA first hypothesis, and the oxygenation of the early oceans and subsequent evolution of eukaryotes.

16. **SC.912.L.15.10:** Identify basic trends in hominid evolution from early ancestors six million years ago to modern humans, including brain size, jaw size, language, and manufacture of tools.

VERY GOOD ALIGNMENT **GOOD ALIGNMENT** FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Trends in Hominin evolution are discussed on pp. 818-820. Figures relating to evolution of hominins include: Fig. 26-21 (comparison of human and gorilla skeleton), and Fig. 24-23 (map showing dispersal of early human lineages from Africa through Asia and Europe).

17. **SC.912.L.15.13:** Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.

Remarks/Examples:

Annually assessed on Biology EOC. Also assesses SC.912.L.15.14, SC.912.L.15.15, and SC.912.N.1.3.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The text does a good job of discussing the importance of natural selection as a mechanism for evolution in Darwin’s theory (p. 555-557), and the contributions of Malthus and Wallace to the development of his ideas.

18. **SC.912.L.15.14:** Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The concept of genetic drift is discussed on pp. 588-589, and is accompanied by a guided inquiry exercise using colored candies. Fig. 18-8 illustrates the founder effect using beetles. The concept of gene flow is discussed in the section on speciation and isolating mechanisms (pp. 594-594).

19. **SC.912.L.15.15:** Describe how mutation and genetic recombination increase genetic variation.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The text does a good job of discussing how mutation and genetic recombination increase genetic variation. The different types of mutations are discussed in Lesson 14.4 on pp. 457-458. Other sources of genetic variation--genetic recombination during sexual reproduction and lateral gene transfer—are discussed, including: gene duplications; neutral mutations, genetic recombination during sexual reproduction, lateral gene transfer, single-gene and polygenic traits, evolution of DDT resistance, and the exchange of genetic material during conjugation in bacteria.

20. **SC.912.L.16.1:** Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance.

Remarks/Examples:

Annually assessed on Biology EOC. Also assesses SC.912.L.16.2.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The major components of Mendelian genetics are discussed in sections on the inheritance of traits in monohybrid crosses in peas (pp. 381-382), and dihybrid (two-factor) crosses in peas (pp. 387-388). The use of Punnett squares to predict the outcomes of these crosses in explained on pp. 384-385.

21. **SC.912.L.16.2:** Discuss observed inheritance patterns caused by various modes of inheritance, including dominant, recessive, codominant, sex-linked, polygenic, and multiple alleles.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The text discusses all of the concepts of and gives examples of the following inheritance patterns: dominant traits (dominant traits in Mendel's peas), recessive traits (recessive traits in Mendel's peas), codomiance (erminette coloring in chickens), polygenic traits (human eye color, human height), multiple alleles (ABO blood groups).

22. **SC.912.L.16.3:** Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.

Remarks/Examples:

Integrate HE.912.C.1.7. Analyze how heredity and family history can impact personal health. Annually assessed on Biology EOC. Also assesses SC.912.L.16.4 SC.912.L.16.5 SC.912.L.16.9.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
DNA replication is discussed in detail in the sections on mitosis and meiosis (p. 396), and sections on the molecular details of DNA replication (pp. 424-427). The role of the DNA molecule in storing information is discusses on pp. 416-417 and illustrated in Fig. 13-4 with a visual analogy for these functions. The text also discusses how heredity and family history can impact personal health in the chapter on the human genome (Chap. 15), which has detailed discussion of karyotypes, transmission of human traits, sex-linked inheritance, pedigree analysis, disorders that result from chromosomal rearrangements, and the genetics of sickle-cell anemia.

23. **SC.912.L.16.4:** Explain how mutations in the DNA sequence may or may not result in phenotypic change. Explain how mutations in gametes may result in phenotypic changes in offspring.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Sources of genetic variation, such as mutations, including neutral mutations, somatic vs. germ-line mutations (hereditary mutations in gametes) are summarized on p. 582. The different types of mutations, point mutations (substitution, insertion, deletion), insertions and deletions (frameshift mutations), chromosomal mutations, the effects of mutations and mutagens, and harmful and helpful mutations are discussed on pp. 457-461. The role of mutations in prokaryotes, especially antibiotic resistance is addressed on pp. 598, 692.

24. **SC.912.L.16.5:** Explain the basic processes of transcription and translation, and how they result in the expression of genes.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The role of DNA (storing info, copying info & gene expression) is discussed on p. 416. Transcription is discussed in detail on pp. 443-444, including RNA editing of pre-mRNA transcripts. The Genetic Code—what it is, how to read it, start and stop codons—is explained on pp. 445-446. The details of the steps in translation of mRNA transcript to proteins in reviewed on pp. 447-449, and illustrated in Fig. 14-7.

25. **SC.912.L.16.8:** Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer.

Remarks/Examples:

Integrate HE.912.C.1.7. Analyze how heredity and family history can impact personal health.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The cell cycle and how it is regulated is discussed on pp. 350-352. Cancer as an example of uncontrolled cell growth is review on p. 353.

26. **SC.912.L.16.9:** Explain how and why the genetic code is universal and is common to almost all organisms.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The text used the concept of the Genetic Code to refer to: (1) the codons in RNA that are decoded at the ribosome during protein translation; and, (2) DNA as a molecule that carries information. The Genetic Code in the first sense is universal, although some organisms (ciliates and mitochondria) use very derived genetic codes. Except for some viruses, all organisms on Earth encode their genetic information in DNA (second sense). The universality of DNA as an information molecule is discussed on pp. 22-24 and underlies molecular evolutionary analyses based on DNA sequences (pp. 620-623).

27. **SC.912.L.16.10:** Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.

Remarks/Examples:

Annually assessed on Biology EOC.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The text has a whole chapter on biotechnology (Chap. 16), and discusses the role of biotechnology in developing drugs (p. 466-467), creating GMO crops (pp. 516-517), and forensics (pp. 523).

28. **SC.912.L.16.13:** Describe the basic anatomy and physiology of the human reproductive system. Describe the process of human development from fertilization to birth and major changes that occur in each trimester of pregnancy.

Remarks/Examples:
Annually assessed on Biology EOC.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The text has detailed diagrams of the male (Fig. 27-28) and female (Fig. 27-29) reproductive systems. Fertilization and fetal development in humans is discussed on pp. 935-936.

29. **SC.912.L.16.14:** Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The cell cycle and stages of mitosis in eukaryotic cells in described in detail on pp. 346-352.

30. **SC.912.L.16.16:** Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The process of meiosis, the reduction of the chromosome number from diploid to haploid during meiosis, and the significance of crossing-over during Prophase I of meiosis, is described in detail on pp. 393-395.

31. **SC.912.L.16.17:** Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.

Remarks/Examples:
Annually assessed on Biology EOC. Also assesses SC.912.L.16.8 SC.912.L.16.14 SC.912.L.16.16.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Meiosis and mitosis are compared and contrasted on pp. 396-397 and in Fig. 12-18. Asexual and sexual reproduction are defined on p. 341, and the evolutionary advantages of each discussed on p. 342.

32. **SC.912.L.17.2:** Explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The abiotic and biotic factors that affect the distribution of organisms in both freshwater and marine ecosystems are discussed on pp. 98-101. Topics covered include the diagnostic characteristics of the: intertidal zone, coastal ocean, and open ocean (photic zone, aphotic zone). The following major zones in freshwater ecosystems are delimited: rivers and streams, lakes and ponds, and freshwater wetlands. The abiotic and biotic factors that affect the distribution of organisms in estuaries, salt marshes and mangrove swamps, are also summarized.

33. **SC.912.L.17.4:** Describe changes in ecosystems resulting from seasonal variations, climate change and succession.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Changes in ecosystems as a result of seasonal variation (pp. 174-177), climate change (pp. 220-221, 650-651) and succession (pp. 182-184) are discussed on the pages cied above and throughout the text whenever relevant.

34. **SC.912.L.17.5:** Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.

Remarks/Examples:
Annually assessed on Biology EOC. Also assesses SC.912.L.17.2 SC.912.L.17.4 SC.912.L.17.8 SC.912.N.1.4.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The basics of the dynamics of populations are covered in detail in Chapter 5 (Populations), including: geographic range, growth rate (e.g., sea otters and lionfish), density and distribution, age structure. The fundamentals of population growth--birthrate and death, immigration and emigration—are described and illustrated in Fig. 5-3. Exponential growth and logistic growth are described and illustrate, as well as the concepts of carrying capacity and seasonal changes on population struture. Patterns of human population growth--demographic transition, age structure and population growth—are discussed on pp. 160-161.

35. **SC.912.L.17.8:** Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The consequences of the loss of biodiversity are discussed in the text primarily in Chapters 6 & 7. Topics covered include a case study on wolf populations in Yellowstone; habitat loss, fragmentation and restoration; hunting and fishing, and invasive species. There is also a case study on how reefs are affected by global climate warming (pp. 828-829). In Chapter 7 (Humans and Global Change), the topics discussed

include: the causes and effects of global change, human causes of global change, the changing atmosphere and climate (fossil fuels and atmosphere, climate change, acid rain, ocean acidification, nitrogen enrichment from fossil fuels, agriculture and the atmosphere). Fig. 7-8 is a diagram showing the fundamental processes of ocean acidification.

36. **SC.912.L.17.9:** Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels.

Remarks/Examples:

Annually assessed on Biology EOC. Also assesses SC.912.E.7.1.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The fundamentals of food webs and trophic pyramids is covered in Chapter 4 (Ecosystems). All of the following topics are covered: primary producers, herbivores, omnivores, scavengers, carnivores, detritivores & decomposers, food chains and food webs, and energy pyramids and the 10% rule. Fig. 4-3 illustrates a food web in a Gulf coast marsh ecosystem. Fig. 4-5 illustrates a generalized energy pyramid and a biomass pyramid.

37. **SC.912.L.17.11:** Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The costs and benefits of renewable and nonrenewable resources are covered in Chapter 7 (Humans and Global Change). Lesson 7.4 (pp. 223-2235) covers sustainability and sustainable development, the UN sustainable development goals, renewable resources, and nonrenewable resources.

38. **SC.912.L.17.13:** Discuss the need for adequate monitoring of environmental parameters when making policy decisions.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Lesson 7.3 (Measuring and responding to change), discusses how modeling climate change can enable the predictions of the levels of CO2, sea level change, and Arctic sea ice extent based on IPCC data. Many of the impacts of climate change are discussed. The case study wrap-up on pp. 226-227 has the students develop policy ideas about how South Florida can cope with rising sea levels.

39. **SC.912.L.17.20:** Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

Remarks/Examples:

Annually assessed on Biology EOC. Also assesses SC.912.L.17.11, SC.912.L.17.13, SC.912.N.1.3.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The impact of individual on environmental systems is covered in Chapter 7, particularly Lesson 7.2 (Causes and Effects of Global Change). Sustainable development is discussed in Lesson 7.4 (Sustainability).

40. **SC.912.L.18.1:** Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.

Remarks/Examples:

Annually assessed on Biology EOC. Also assesses SC.912.L.18.11.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The basic molecular structures and primary functions of the four main classes of macromolecules in biological systems (carbohydrates, lipids, nucleic acids, and proteins) are covered in Chapter 2 (The Chemistry of Life).

41. **SC.912.L.18.7:** Identify the reactants, products, and basic functions of photosynthesis.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The fundamental processes that take place in photosynthesis are extensively covered in Chapter 9 (Photosynthesis), including: electron carriers, the general equation for photosynthesis, the light-dependent reactions, and the light independent reactions (carbon fixation, sugar production, summary of Calvin Cycle). Fig. 9-6 illustrates the stages of photosynthesis, and Fig. 9-9 illustrates the light-independent reactions. In addition, the factors that affect photosynthesis (temperature, light, and water) are discussed. The fundamental processes that take place in photosynthesis are extensively covered in Chapter 9 (Photosynthesis), including: electron carriers, the general equation for photosynthesis, the light-dependent reactions, and the light independent reactions (carbon fixation, sugar production, summary of Calvin Cycle). Fig. 9-6 illustrates the stages of The fundamental processes that take place in photosynthesis are extensively covered in Chapter 9 (Photosynthesis), including: electron carriers, the general equation for photosynthesis, the light-dependent reactions, and the light independent reactions (carbon fixation, sugar production, summary of Calvin Cycle). Fig. 9-6 illustrates the stages of photosynthesis, and Fig. 9-9 illustrates the light-independent reactions. In addition, the factors that affect photosynthesis (temperature, light, and water) are discussed.

42. **SC.912.L.18.8:** Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
The fundamentals of cell respiration are covered in detail in Chapter 10 (Cellular Respiration). Topics covered include: an overview of

cellular respiration, ATP and NAPD, glycolysis, the Krebs cycle, electron transport and ATP synthesis. Anaerobic processes, such as fermentation (alcoholic and lactic acid) are also covered in this chapter.

43. **SC.912.L.18.9:** Explain the interrelated nature of photosynthesis and cellular respiration.

Remarks/Examples:
Annually assessed on Biology EOC. Also assesses SC.912.L.18.7 SC.912.L.18.8 SC.912.L.18.10.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The interrelated nature of photosynthesis and cellular respiration is discussed on p. 313 in Chapter 10. Fig. 10-2 (a global balance) is a diagram that depicts the cyclical nature of the products produced/consumed during photosynthesis and the products produced/consumed during cell respiration.

44. **SC.912.L.18.10:** Connect the role of adenosine triphosphate (ATP) to energy transfers within a cell.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The role of ATP in energy transfers within cells is discussed in Chapter 9 (Cellular Respirations). Concepts covered include: how energy is stored and released in the ATP molecule. Fig. 9-1 makes an analogy between the storage of energy in ATP and the storage of energy in batteries.

45. **SC.912.L.18.11:** Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, and their effect on enzyme activity.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The role of enzymes as biological catalysis is covered in Chapter 2 (The Chemistry of Life). Topics covered include: the enzyme-substrate complex, how enzymes function, the effect of temperature and pH on enzymatic activity, and regulation of enzyme activity. Fig. 2-24 is a diagram of an enzyme-catalyzed reaction; Fig. 2-23 depicts how enzymes lower activation energy.

46. **SC.912.L.18.12:** Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.

Remarks/Examples:
Annually assessed on Biology EOC.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The unique properties of water that contribute to Earth’s suitability as an environment for life are discussed in Chapter 2 (The Chemistry of Life). Topics discussed include: water as a polar molecule, hydrogen bonding between water molecules, cohesion, adhesion, the high heat capacity of water, and the fact that living organisms contain a large proportion of water.

47. **SC.912.N.1.1:** Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:

1. Pose questions about the natural world, (Articulate the purpose of the investigation and identify the relevant scientific concepts).
2. Conduct systematic observations, (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).
3. Examine books and other sources of information to see what is already known,
4. Review what is known in light of empirical evidence, (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).
5. Plan investigations, (Design and evaluate a scientific investigation).
6. Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).
7. Pose answers, explanations, or descriptions of events,
8. Generate explanations that explicate or describe natural phenomena (inferences),
9. Use appropriate evidence and reasoning to justify these explanations to others,
10. Communicate results of scientific investigations, and
11. Evaluate the merits of the explanations produced by others.

Remarks/Examples:
Florida Standards Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LAFS.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LAFS.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LAFS.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LAFS.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LAFS.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LAFS.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LAFS.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks analyze the specific results based on explanations in the text.

LAFS.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

LAFS.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LAFS.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

Florida Standards Connections for Mathematical Practices

MAFS.K12.MP.1: Make sense of problems and persevere in solving them.
MAFS.K12.MP.2: Reason abstractly and quantitatively.
MAFS.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]
MAFS.K12.MP.4: Model with mathematics.
MAFS.K12.MP.5: Use appropriate tools strategically.
MAFS.K12.MP.6: Attend to precision.
MAFS.K12.MP.7: Look for and make use of structure.
MAFS.K12.MP.8: Look for and express regularity in repeated reasoning.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
All of these aspects are covered thoroughly throughout the text, specifically in the Lesson Review Questions and End of Chapter Assessments. Specific examples of problem solving include: using bioremediation to clean up pollution (pp. 274-275), understanding genetic disorders (pp. 400-401), and managing the cholera outbreaks in Haiti (pp. 714-715). Specific examples of problem solving include: using bioremediation to clean up pollution (pp. 274-275), understanding genetic disorders (pp. 400-401), and managing the cholera outbreaks in Haiti (pp. 714-715).

48. **SC.912.N.1.3:** Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.

Remarks/Examples:
Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.

Florida Standards Connections: MAFS.K12.MP.2: Reason abstractly and quantitatively MAFS.K12.MP.3: Construct viable arguments and critique the reasoning of others

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT

Justification:
These activities are integrated throughout the test and assessments. Specific examples include asking students to design a hydroponics system (like that used in Antarctica research station or on the space station). Students are also asked to use their reasoning to evaluate stem cell research, DNA barcoding and green turtle populations in Florida, use of GMO crops, and the development of herbicide resistance in agriculture.

49. **SC.912.N.1.4:** Identify sources of information and assess their reliability according to the strict standards of scientific investigation.

Remarks/Examples:
Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.

Florida Standards Connections: LAFS.910.RST.1.1 / LAFS.1112.RST.1.1.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
These activities are integrated throughout the test and assessments. Specific examples include asking students to critically evaluate claims about a sports drink, and identifying a product that uses hydrophobic technology and evaluate claims.

50. **SC.912.N.1.6:** Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.

Remarks/Examples:
Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.

Florida Standards Connections: MAFS.K12.MP.1: Make sense of problems and persevere in solving them.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
These activities are integrated throughout the test and assessments. Specific examples include evaluating the results from research projects on marsh grass and nutrients, and the response of phytoplankton to iron enrichment. Hands-on activities include an experiment on microbial succession and a lab on flower dissection.

51. **SC.912.N.2.1:** Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).

Remarks/Examples:
Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not science seeks falsifications, pseudo-science seeks confirmations.)

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
These activities are integrated throughout the test and assessments. Specific examples include evaluating the results from research projects on marsh grass and nutrients, and the response of phytoplankton to iron enrichment. Hands-on activities include an experiment on microbial succession and a lab on flower dissection.

52. **SC.912.N.2.2:** Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.

Remarks/Examples:
Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).

Florida Standards Connections: MAFS.K12.MP.3: Construct viable arguments and critique the reasoning of others.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
These concepts are reviewed throughout the textbook. Specific examples include a paragraph on “What Science Is and Is Not”.

53. **SC.912.N.3.1:** Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.

Remarks/Examples:
Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.

Florida Standards Connections: MAFS.K12.MP.1: Make sense of problems and persevere in solving them and, MAFS.K12.MP.3: Construct viable arguments and critique the reasoning of others.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The authors (p. 14) define a scientific theory in Chapter 1 as follows: “In science, the word theory applies to a tested, highly-reliable

scientific explanation of events in the natural world that unifies many repeated observations and incorporates durable, well-supported hypotheses that enable scientists to make accurate predictions."

54. **SC.912.N.3.4:** Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.

Remarks/Examples:
Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
The definitions of the terms theory and law are defined on p. 14 in Chapter 1 (The Science of Biology). The difference between a scientific theory and a law is described in a side-bar on p. 14 (Academic Words).

55. **LAFS.910.RST.1.1:** Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanation or descriptions, by answering questions in the Lesson Review (e.g., metric system), or chapter assessments (e.g., Mendelian genetics).

56. **LAFS.910.RST.1.2:** Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to perform the above by answering questions on various biogeochemical cycles, cell respiration, and/or photosynthesis.

57. **LAFS.910.RST.1.3:** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to perform the above by the above tasks in the chapter assessments by answering questions on mitosis and meiosis.

58. **LAFS.910.RST.2.4:** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to perform the above tasks by answering questions in the chapter assessments that relate to human genetics, pedigrees, and biotechnology.

59. **LAFS.910.RST.2.5:** Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to perform the above tasks by answering questions in the chapter assessment on the various biochemical cycles in photosynthesis.

60. **LAFS.910.RST.2.6:** Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to perform the above tasks in the chapter assessments. For example, students are asked to determine the author's purpose in discussing an experiment on how trees and fungi share carbon atoms.

61. **LAFS.910.RST.3.7:** Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to perform the above tasks in the chapter assessments. For example, in Chapter 22, students are asked to complete a table comparing the characteristics of green algae, ferns, mosses, cone-bearing plants, and flowering plants.

62. **LAFS.910.RST.3.8:** Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT

Justification:
Students are asked to perform the above tasks in the chapter assessments. For example, in Chapter 17, students are asked how evidence from many places around the world, instead of only a single habitat or biome, help strengthen Darwin's theory of evolution.

63. **LAFS.910.RST.3.9:** Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to perform the above tasks in the chapter assessments. For example, in a case study on antibiotic resistance, students are asked to explain how natural selection creates drug-resistant strains of pathogenic bacteria.

64. **LAFS.910.RST.4.10:** By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
If the students have read this textbook by the end of grade 10, they will have fulfilled the standard above.

65. **LAFS.910.SL.1.1:** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.
c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
If the teacher has engaged the student in the above activities, they will have fulfilled this standard.

66. **LAFS.910.SL.1.2:** Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to research topics and present their results in diverse media/formats throughout the text.

67. **LAFS.910.SL.1.3:** Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of researching public health issues related to the cholera outbreak in Haiti.

68. **LAFS.910.SL.2.4:** Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of a research project on environmental issues/problems in the Everglades.

69. **LAFS.910.SL.2.5:** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of a research project comparing population growth trends in China vs. Indian.

70. **LAFS.910.WHST.1.1:** Write arguments focused on discipline-specific content.

a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
e. Provide a concluding statement or section that follows from or supports the argument presented.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of researching public health issues related to the cholera outbreak in Haiti.

71. **LAFS.910.WHST.1.2:** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of writing about the various processes and molecules involved in photosynthesis.

72. **LAFS.910.WHST.2.4:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of writing about water purification, cells, and other topics in the textbook.

73. **LAFS.910.WHST.2.5:** Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of answering a question on the genetics of coat color in puppies.

74. **LAFS.910.WHST.2.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of researching and writing about the impact of wolf populations in Yellowstone National park.

75. **LAFS.910.WHST.3.7:** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of developing proposals for wildlife safe highway crossing for wildlife.

76. **LAFS.910.WHST.3.8:** Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of several of the end of chapter assessments.

77. **LAFS.910.WHST.3.9:** Draw evidence from informational texts to support analysis, reflection, and research.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
That's pretty much what reading a science textbook is all about.

78. **LAFS.910.WHST.4.10:** Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification:
Students are asked to do the above in the context of several of the end of chapter assessment.

79. **HE.912.C.1.3:** Evaluate how environment and personal health are interrelated.

Remarks/Examples:
Food options within a community; prenatal-care services; availability of recreational facilities; air quality; weather-safety awareness; and weather, air, and water conditions.

( ) VERY GOOD ALIGNMENT ( ) GOOD ALIGNMENT (●) **FAIR ALIGNMENT** ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification:
Chapter 27 (The Human Body) Begins with a case study on the lead contamination in the drinking water of Flint, MI, and the role of liver in neutralizing toxins is briefly mention on p. 913.

80. **HE.912.C.1.5:** Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases.

Remarks/Examples:
Health prevention, detection, and treatment of: breast and testicular cancer, suicide, obesity, and industrial-related chronic disease.

( ) VERY GOOD ALIGNMENT (●) **GOOD ALIGNMENT** ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification:
The concepts in the standard above are addressed in sections of the text in which discuss the use of vaccines to prevent viral diseases, and the limited availability of antiviral drugs for some viral infections (p. 687); and, the use of vaccines to prevent some bacterial diseases, and the role of antibiotics in treating bacterial diseases. Other chronic diseases are showcased in some of the case studies that are presented at the beginning of each chapter.

81. **HE.912.C.1.7:** Analyze how heredity and family history can impact personal health.

Remarks/Examples:
Drug use, family obesity, heart disease, mental health, and non-communicable illness or disease.

( ) VERY GOOD ALIGNMENT (●) **GOOD ALIGNMENT** ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification:
The concepts in the standard above are addressed throughout the text. Specific examples include: discussion of cell disease, cystic fibrosis, and Huntington's disease; the potential of the "person genome" for identifying and treating hereditary diseases; and, an in-depth study of the pedigree of hemophilia in European royal family.

82. **MAFS.912.N-Q.1.1:** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification:
The Metric System is review in Appendix A, and the units used to measure: length, area, volume, mass, and temperature are summarized. Other activities related to this standard include: an introduction to the pH scale and guided inquiry on testing pH of common foods/drinks; interpreting a graph of the half-life of radioactive isotope potassium-40, and a guided inquiry on modeling half-life; and a study of the Geologic Time Scale in which the periods/eras/eons are measured in millions of years.

83. **MAFS.912.N-Q.1.3:** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification:
This standard is specifically addressed in Appendix A which has sections on comparing accuracy and precision, estimation, significant figures, and scientific notation. Other examples in the text include a paragraph on collecting and analyzing data (pp. 12-13), and discussion on the metric system accompanied by a table of common SI units and a photo of a scientist measuring a giant tortoise.

84. **ELD.K12.ELL.SC.1:** English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification:

85. **ELD.K12.ELL.SI.1:** English language learners communicate for social and instructional purposes within the school setting.

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification: