Instructional Materials Administrator

BID 3299

Recommendation

Yes

Comments: This an excellent Earth Science text book. It is well-written and easy to read, with up-to-date information on geological sciences, oceanography, meteorology and climate science, planetary sciences and astronomy. The diagrams and illustrations are engaging, detailed, colorful, and well-drawn. The online text comes with a diversity of downloadable worksheets, labs, transparencies, and notebook pages. In addition to the print materials, there are links supplementary online videos and interactive learning modules. I wish I had been able to use such an excellent resource when I taught Earth and Space Science.

Material for Review

Course: Earth/Space Science (2001310)
Title: Glencoe Earth Science, Florida Edition , Edition: 1
Copyright: 2019
Author: McGraw-Hill Education, LLC
Grade Level: 9 - 12

Content

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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

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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:
The content shows very good alignment with the Florida State Science Standards. In the online version of the Teacher Edition, there is a button/icon at the top of the page that allows one to check which standards are addressed on each page, as well as for each lesson. The printed pages also reference the standards covered and are marked by a distinctive icon (yellow map of Florida overlain on a blue circle.

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 content of this text is well-written and appropriate for the skill level of the standards and benchmarks in a high school earth and space science course.

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:
The materials are extremely adaptable and useful for classroom instruction. There are a number of online resources available for each chapter, such as: Powerpoint presentations for each chapter and section that include images and interactive multiple-choice questions pertaining to the information covered in the text. Teachers can also download images and activities that can be copied onto overhead transparencies. All of the worksheets for each chapter are available as Word (.doc) files and as PDF (.pdf) that can be filled out on a computer. Each section also has an online Section Self-Check which has 5-6 multiple-choice questions that the student can answer then submit the answers for grading. The results can be then be emailed to the teacher/instructor. Other online resources include the worksheets and answers for the: WebQuests (activities that require students to research information on the internet), GeoLABs (students conduct simple lab activities or interpret data), Science Notebook pages (printable pages that students use to integrate and summarize information as they read the text), LaunchLABs (instructions for the labs), printable Study Guides for each chapter, eFlashcards for each chapter, and eGames (crossword puzzles and interactive study games in English and Spanish). Within the text, there are review questions at the end of each section, chapter summaries with vocabulary words at the end of each chapter, and a variety of assessments 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:
The materials provide sufficient details for students to understand the significance of topics and events. The information presented in the reading is accompanied by illustrative diagrams, maps, charts, photographs, and summary tables.

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:
Yes, it does.

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:
Yes, it does.

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:
Yes, it does.

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:
NA. There aren't any primary or secondary sources cited in the text or supplementary materials that I could find. It would be helpful for the students to understand that all of information presented is based on actual scientific research.

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:
NA. There aren't any primary or secondary sources cited in the text or supplementary materials that I could find. It would be helpful for the students to understand that all of information presented is based on actual scientific research.

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:
I found one error on p. 484 in the Problem Solving Lab at the bottom of the page. The instructions ask the students to copy the map which is described as: "the Gibbs Fracture Zone, which is a segment of the Mid-Atlantic Ridge located south of Iceland and west of the British Isles." The figure referred to, however, is a map of the Pacific ocean basin, not the Atlantic. There is also a typo in the Table of Contents side bar of the online text: The Unit 4 title reads "The Atmoshphere and the Oceans" and should be corrected to say "The Atmosphere and the Oceans."

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:
All of the material covered in this text is presented objectively.

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:
The content of the material covered in this text is representative of the various earth (geology, oceanography, meteorology, etc.) and space science disciplines.

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:
The content of the material in this text is factually accurate, and I didn't find any mistakes or inconsistencies in the chapters that I read.

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:
All of the content covered in this text is up-to-date.

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:
The content is presented in an appropriate and relevant context for high school students. We all live on planet Earth, and here in Florida we are surrounded by the ocean. And, all Florida students should learn about the fundamentals of astronomy considering Florida's contributions to astronomy and space exploration.

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:

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, the content includes many references to real-life applications of geology, oceanography, meteorology and the space sciences,

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, the earth and space sciences are inherently interdisciplinary, drawing from the fields of biology, geology, meteorology, oceanography, astronomy, chemistry, physics, and mathematics.

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:
Most of the images in the text do not show people, but show rock specimens, fossils, outcrops, mountains, volcanoes, illustrations, graphs, etc. The images that do portray people show people in professional situations, such as in the laboratory or in the field doing research. Many of the images of scientists show people in field situations wearing gear that covers their bodies and faces, making it impossible to tell their gender, race or ethnicity. The other images with people show a diversity of scientists; for example, woman scientists of color are shown in Fig. 6 (p. 14), and on pp. 761, 785, 890, and 897. In addition, the timelines in each chapter that list significant events in each field, list the contributions of women, as well as contributions from scientists from non-Western regions of the world. For example, in 1925, Cecilia Payne's analysis of the spectra of the stars reveals that hydrogen and helium are the most abundant elements in the universe. And, in 1159, the Arab scholar Al-Idrisi creates a world map that is used by European explorers.

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 in the text that portray people working in the laboratory or field situations. Most of the images with people are of individuals working alone. In the few images where there are two or more people they are interacting respectfully and professionally. The text does not include any pornographic images. All of the images in the text that portray animals in their natural environment; for example, a female marine scientist is shown recording observations of a manatee on page. 278-9. None of the images show animals being mistreated.

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, the material provided by the publishing company document that the text covers all of the benchmarks and standards required by the State of Florida.

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:
The online version of this text provides a complete set of resources (readings, PPTs, worksheets, handouts, study guides, labs, research projects) for each chapter. Teachers will still need to acquire and prepare materials for the labs. Also, earth science is also best taught with hands-on teaching materials like rock, mineral and fossil specimens, models, and maps, none of which would be included with a textbook, online or otherwise.

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, all of the components of this online text align with the curriculum and each other.

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:
Yes, the materials are logically organized and consistent with the subjects covered in each chapter.

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 text is easy to read without being simplistic or excluding accurate scientific terminology. The information presented in the text is supplemented with color photos, color illustrations, maps, charts, and tables.

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:
The amount of content presented in each section would be easy for students to read during class or at home.

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:
For each chapter, there are a number of downloadable files that can be used to help the students navigate the material presented in each chapter. The pages from the Science Notebook would be really useful to have the students fill out as they read each chapter. The Science Notebook pages include a diversity of activities, such as asking the students to summarize the main points of a section, defining new and review vocabulary words, having the students draw diagrams of processes, comparing and contrasting processes, answering questions, and writing short answers. Integrated throughout the text, are suggestions for ways to help students learn by using foldables. Also, the online version of the text has the option to have each page read out loud.

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:
This text (online version) does an excellent job of satisfying the PRESENTATION requirement very well by providing teachers with a wide array of supplementary materials that can be used for diversity of in-class activities, projects, and labs, in addition to assessments (quizzes and chapter reviews).

Learning

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A. Motivational Strategies1. A. Instructional materials include features to maintain learner motivation.

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

Justification:
In addition to standard educational materials (textbook, handouts, worksheets and assessments), this text includes 162 interactive activities (e.g., drag and drop tables) and animations (e.g., animation of landslides and debris flows) and videos, all of which work together to maintain learner motivation. For example, in Chapter 25 (Energy Resources), the students explore human use of energy, renewable and non-renewable energy sources (fossil fuels). Figure 4 (Visualizing Coal on p. 711) has a full-page diagram that shows how coal forms. The process of coal formation is listed as 4 steps and accompanied by a color illustration of the 4 steps. Enlargements of different layers in the illustration are illustrated by photographs of the different types of coal. At the bottom of the page is a link to an online animation of coal formation. A hands-on MiniLAB has students model oil migration using cooking oil, water, sand and aquarium gravel.

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:
Each chapter begins with a “big idea” that summarizes the main point of the chapter; for example, the “big idea” for Chapter 25 (Energy Resources) is that “People use energy resources, most of which originate from the Sun, for everyday living.” And, the accompanying educational materials focus on and thoroughly teach a few important ideas, concepts or themes. For example, the GeoLAB for Chapter 25 has students work in groups to design a miniature energy efficient building using common everyday materials (cardboard boxes, Styrofoam, aluminum foil, etc.), and test its heat efficiency.

C. Explicit Instruction3. C. The materials contain clear statements of information and outcomes.

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

Justification:
All of the labs (MiniLABs, GeoLABs) and worksheets (Science Notebook) contain instructions that are easy to understand, and the purpose and outcomes are clear cut.

D. Guidance and Support4. 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:
The learning activities included with this text include a number of activities that require students to develop abilities other than to memorize information and regurgitate it by answering review questions. The MiniLAbs and GeoLABs ask students to work together in groups to achieve a common result. Other activities throughout the text have the students complete research projects and present their results as a poster or oral presentation. For example, the “Writing in Earth Science: Focus on Florida” (p. 428) asks students to: “Research the health of beaches in Florida. Then, suppose you are a news caster presenting a story for the nightly news about environmental issues associated with beaches. Present your story to the class, explaining results of scientific studies and why these results are important to swimmers.”

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:
There are several different ways that the educational content of this text and associated resources can be adapted to students with developmental differences and various learning styles. In additional to traditional reading and answering questions related to content, there are hands-on labs, exercises that involve maps and models, research projects that use the internet, group projects, poster presentations, supplementary videos, online flashcards, as well as the suggested foldables that are integrated into the chapters and sections.

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:
Yes, the materials incorporate a wide variety of activities that engage both the physical and mental activity of students during the learning process. For example, Each chapter includes labs (MiniLABs and GeoLABS) which have the students do hands-on lab activities where they work in groups, analysis of data, videos and interactive online activities, as well as the Science Notebook pages which help students organize the information that they read in each chapter/section of the text.

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:
This text does an excellent job of including organized activities that are logical extensions of the content, goals, and objectives. See the above comments for details.

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 Center includes suggested teaching strategies help with the presentation of the material in class, a list of procedures, and suggestions for how to have the students analyze their work.

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:
Yes. See above comments.

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:
Yes. See above comments.

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:
Yes. See above comments.

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 online version of the text has an icon that when clicked will read the page out loud, including the figures, reading checks, and other insets on the page. The voice is easy to understand and proceeds at a pace that allows the listener to process the information covered.

There is a glossary in the back of the book with terms defined in both English and Spanish. Teachers can also download a ZIP file that includes 13 multi-lingual science glossaries in the following languages: Arabic, Bengali, French, Haitian Creole, Hmong, Korean, Mandarin, Portuguese, Russian, Spanish, Tagalog, Urdu, and Vietnamese. The text advocates the use of foldables to help the students organize the information that they are learning, and there are suggestions throughout the text about where, when and how to use them (e.g., layered-lock book, trifold book, three-tab book, two- and four-tab book, shutter-fold and four-door books, concept-map book, vocabulary book, folded chart, pocket book, bound book, top-tab book, and accordion book).

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, this text incorporates Mathematical Practices where applicable. Students are asked to use a variety of mathematical techniques throughout the text, whether it be in the end of chapter assessments, Science Notebook pages, MiniLABs, GeoLABs, or the Math in Earth Science questions.

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:
Yes, this text and accompanying materials do thorough job of satisfying the learning requirements as listed above.

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.5.1:** Cite evidence used to develop and verify the scientific theory of the Big Bang (also known as the Big Bang Theory) of the origin of the universe.

Remarks/Examples:
Explain evidence to support the formation of the universe, which has been expanding for approximately 15 billion year (e.g. ratio of gases, red-shift from distant galaxies, and cosmic background radiation).

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

Justification:
The Big Bang Theory is defined as: “the theory that the universe began as a point and has been expanding since” on p. 880. Different lines of evidence in support of the Big Bang Theory, such as the Hubble Constant, recently reconfirmed using data from the Hubble Telescope. The age of the universe is given as 13.7 billion years. Other evidence that confirms that the universe is expanding is discussed, such as the distribution of cosmic background radiation (map figured).

2. **SC.912.E.5.2:** Identify patterns in the organization and distribution of matter in the universe and the forces that determine them.

Remarks/Examples:

Identify patterns that influence the formation, heirarchy, and motions of the various kinds of objects in the solar system and the role of gravity and inertia on these motions (include the Sun, Earth, and Moon, planets, satellites, comets, asteroids, star clusters, galaxies, galaxy clusters). Recognize that the universe contains many billions of galaxies, and each galaxy contains many billions of stars. Recognize that constellations are contrived associations of stars that do not reflect functional relationships in space.

Florida Standards Connections: MAFS.K12.MP.7: Look for and make use of structure.

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

Justification:
Students are asked throughout the text to identify patterns that influence the formation, hierarchy, and motions of various objects in the solar system and the role of gravity and inertia on these motions. For example, the role of gravitational attraction in the formation of the solar system is described on pages 796-798, as well as in the zonation of planets in the solar system into inner terrestrial planets, outer gas giants, and dwarf planets and comets (p. 811). The role of gravitational attraction in holding together star clusters is addressed on p. 839. On page 861, the introductory pages of Chapter 30 (Galaxies and the Universe), there are illustrations and photos of different types of galaxies, accompanied by a description that includes the statement that: “Each galaxy contains billions of stars, and there are billions of galaxies.” The patterns of stars that humans (ancient and modern) have grouped into constellations, the seasonal change in some constellations, and their role in ancient cultures are discussed on p. 837.

3. **SC.912.E.5.3:** Describe and predict how the initial mass of a star determines its evolution.

Remarks/Examples:

Compare and contrast the evolution of stars of different masses (include the three outcomes of stellar evolution based on mass: black hole, neutron star, white dwarf). Differentiate between the different types of stars found on the Hertzsprung-Russell diagram and the balance between gravitational collapse and nuclear fusion in determining the color, brightness, and life span of a star.

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

Justification:
Chapter 29 (Stars), Section 3 (Stellar Evolution) describes in detail the following concepts: the relationship between mass and a star’s evolution, the features of massive and regular star life cycles, and how the universe is affected by the life cycles of stars. On p. 847, the effects of mass on the properties of a star are described, emphasizing that the greater the mass of a star, the greater the gravitational forces that are acting on it. Fig. 17 illustrates how the pressure from the radiation of fusion is balance by gravity, resulting in a star that is stable and will not expand or contract. Stellar evolution—changes in molecular composition of the core, density, temperature and luminosity-- is detailed on this same page and illustrated in Fig. 18 on p. 848. There is also a link to online animations that shows star formation and the helium core. On pages 848-851, the following topics are discussed and illustrated (Figs. 19-24): life cycles of stars like the Sun (red giants, planetary nebula, white dwarfs), and life cycles of massive stars (supergiants, supernova formation, neutron stars, pulsars, supernovas, and black holes).

4. **SC.912.E.5.4:** Explain the physical properties of the Sun and its dynamic nature and connect them to conditions and events on Earth.

Remarks/Examples:

Describe the physical properties of the Sun (sunspot cycles, solar flares, prominences, layers of the Sun, coronal mass ejections, and nuclear reactions) and the impact of the Sun as the main source of external energy for the Earth.

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

Justification:
The physical properties of the Sun are discussed in Chapter 29, such as: its size, mass, density, composition, and structure. The amount of energy that is received by Earth is given as 1354 J of energy per 1 m2/s (p. 835). The effect of the charged particles that are emitted by the Sun and trapped in the Van Allen Belts is discussed on p. 832. Sunspot cycles are discussed on p. 833, and the relationship between sunspot cycles and climate change (cooling and warming) on Earth is discussed on p. 390.

5. **SC.912.E.5.5:** Explain the formation of planetary systems based on our knowledge of our Solar System and apply this knowledge to newly discovered planetary systems.

Remarks/Examples:

Describe how evidence from the study of our Solar System and newly discovered extra solar planetary systems supports the Nebular theory of the formation of planetary systems.

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

Justification:
The formation of our solar system is described in Chapter 28 (Our Solar System), Section 1 (Formation of the Solar System), including interstellar clouds and their collapse, the gradual acceleration of the collapse of interstellar clouds, into a flattened cloud, the condensation of matter within the rotating disk, the formation of planetismals, the formation of gas giants, the formation of terrestrial planets, and interplanetary debris (pp. 796-799). There is a worksheet on Newly Discovered Planetary Systems that applies the analogy of the nebular theory to the formation of other planetary systems.

6. **SC.912.E.5.6:** Develop logical connections through physical principles, including Kepler's and Newton's Laws about the relationships and the effects of Earth, Moon, and Sun on each other.

Remarks/Examples:

Explain that Kepler's laws determine the orbits of objects in the solar system and recognize that Kepler's laws are a direct consequence of Newton's Law of Universal Gravitation and Laws of Motion.

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

Justification:
Kepler's First Law—the orbits of the planets are ellipses, with the Sun at one focus of the ellipse—is described on p. 800 and illustrated in Fig. 5. Kepler's second law—the line joining a planet to the Sun sweeps out equal areas in equal times as the planet travels around the ellipse—is described on p. 801 and illustrated in Fig. 6. Kepler's third law—the square of the planet's orbital period equals the cube of the semi-major axis of the orbital ellipse (P^2 = a^3)—is also described on p. 801. The relationships between Kepler's Laws and Newton's Law of Universal Gravitation and Laws of Motion are described on p. 802 and illustrated in Fig. 8. There is also a Teaching Visual (transparency) and accompanying worksheet that can be used to teach Kepler's Laws.

7. **SC.912.E.5.9:** Analyze the broad effects of space exploration on the economy and culture of Florida.

Remarks/Examples:
Recognize the economic, technical and social benefits of spinoff technology developed through the space program.

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

Justification:
There are a few direct mentions of the broad effects of space exploration on the economy and culture of Florida. Fig. 6 on p. 768 show the launch of the Atlas V rocket from Cape Canaveral, Florida, and explains that the rocket, launched in 2016, carried a probe into space that will gather samples from an asteroid. Spinoff technology from the space program that is mentioned on p. 769, includes: technology for the space shuttle's fuel pumps lead to development of pumps used in artificial hearts, memory foam (mattresses and pillows) is a result of NASA crash technology, and "more than 1500 different NASA technologies have been passed on to commercial industries for common use."

8. **SC.912.E.5.11:** Distinguish the various methods of measuring astronomical distances and apply each in appropriate situations.

Remarks/Examples:
Determine which units of measurement are appropriate to describe distance (e.g. astronomical units, parallax, and light years).

Florida Standards Connections: MAFS.K12.MP.5: Use appropriate tools strategically and MAFS.K12.MP.6: Attend to precision.

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

Justification:
An astronomical unit is defined on p. 800, 1 AU = 1.496 X 10^8 km (Earth's average distance from the Sun). A light-year (ly) is defined on p. 840 as the distance light travels in one year (9.461 x 10^12 km). A parsec (pc) is also defined on p. 840 as equal to 3.26 ly (3.086 X 10^13 km). Parallax is defined on p. 841--the apparent shift in position of stars caused by the motion of the observer--and illustrated with a diagram in Fig. 14. There is also a MiniLAB (p. 843) on modeling parallax, which has the students use a string, meter stick and protractor to measure angles to simulate and graph the concept of parallax.

9. **SC.912.E.6.1:** Describe and differentiate the layers of Earth and the interactions among them.

Remarks/Examples:
Recognize the importance of the study of seismic wave data and how it can be used to determine the internal structure, density variations, and dynamic processes between Earth's layers.

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

Justification:
There are several figures that illustrate the layers of the Earth in cross-section, including Fig. 3 on p. 8). The depths of the various layers are also described on this page. The differences in the travel times of S- and P-waves through the earth are discussed on p. 536, and illustrated in a Visualizing Science inset that has a nice diagram that shows the trajectories of P-waves and S-waves. Additional topics that relate to the layers of the Earth and interactions between them are incorporated into the chapters on plate tectonics (especially the movement of the plates), the section of mountain building (as it pertains to plate interactions), and discussion of the formation of the Earth's crust.

10. **SC.912.E.6.2:** Connect surface features to surface processes that are responsible for their formation.

Remarks/Examples:
Identify various landforms (e.g. dunes, lakes, sinkholes, aquifers) and describe how they form (erosion, physical/chemical weathering, and deposition). Explain how sea level changes over time have exposed and inundated continental shelves, created and destroyed inland seas, and shaped the surface of the Earth.

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

Justification:
There is extensive discussion of the Earth's landforms and how they form. There is a whole section on the different types of weathering illustrated with excellent images of the different features that result from weathering. There are several pages that discuss erosion and deposition, mass movements, wind erosion and transport, glacial erosion and transport, and water erosion and transport. There is extensive discussion of water bodies on the surface of the Earth (streams, freshwater wetland, springs, and groundwater. And, there are several pages that address the formation of shoreline features along the coasts. All of these topics are well-illustrated by color photographs of the features and the environments in which they form.

11. **SC.912.E.6.3:** Analyze the scientific theory of plate tectonics and identify related major processes and features as a result of moving plates.

Remarks/Examples:

Discuss the development of plate tectonic theory, which is derived from the combination of two theories: continental drift and seafloor spreading. Compare and contrast the three primary types of plate boundaries (convergent, divergent, and transform). Explain the origin of geologic features and processes that result from plate tectonics (e.g. earthquakes, volcanoes, trenches, mid-ocean ridges, island arcs and chains, hot spots, earthquake distribution, tsunamis, mountain ranges).

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

Justification:
There is a whole chapter on plate tectonics theory—Chapter 17—that covers all the major components of the theory: seafloor spreading, plate boundaries and their interactions, and mechanisms of plate movements. This chapter also includes discussion of the development of the theory from Alfred Wegner's continental drift hypothesis, and other discoveries that lead to the modern theory of plate tectonics. Other topics relevant to plate tectonics include: association between plate boundaries and volcanism and earthquakes, and mountain building at plate boundaries.

12. **SC.912.E.6.4:** Analyze how specific geologic processes and features are expressed in Florida and elsewhere.

Remarks/Examples:

Describe the effect of ocean and Gulf water currents, gravel mining, beach erosion, dune development, aquifers and ground water, salt water intrusion, springs, and sink holes on the formation of the Florida peninsula. Explain the effects of latitude, elevation, topography (land surface type), proximity to large bodies of water, and temperature of ocean currents, on climate in Florida.

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

Justification:
The text describes aspects of barrier island formation in Florida, karst topography and sinkholes and springs, and the intrusion of saltwater along coastal regions into the groundwater. The text also describes how flooding is a hazardous problem in Florida due to its low elevation and high rainfall throughout the year.

13. **SC.912.E.6.5:** Describe the geologic development of the present day oceans and identify commonly found features.

Remarks/Examples:

Describe the topography of the ocean floor and how it formed (e.g. plate tectonics, sea level changes).

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

Justification:
The development of the present-day oceans is thoroughly described in Chapters 14 and 16. The origin of the water in the oceans is described in Chapter 14. The geological development of the oceans and the features that characterize the ocean basins (e.g., mid-ocean ridges, continental margin, continental shelf, continental slope, turbidity currents, continental rise, deepsea trenches, abyssal plans, hydrothermal vents, seamounts & guyots) are described in Chapter 16.

14. **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 water cycle is described in detail and illustrated in Fig. 1 (Chapter 9). The carbon and nitrogen cycles are described in detail and illustrated in Fig. 11 (Chapter 24).

15. **SC.912.E.7.2:** Analyze the causes of the various kinds of surface and deep water motion within the oceans and their impacts on the transfer of energy between the poles and the equator.

Remarks/Examples:

Explain how surface and deep-water circulation patterns (Coriolis effect, La Niñ a, El Niñ o, Southern Oscillation, upwelling, ocean surface cooling, freshwater influx, density differences, Labrador Current and Gulf Stream) impact energy transfer in the environment.

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

Justification:
Ocean currents and circulation are described in Chapter 15 (Earth's Oceans). This chapter described the major water masses in the ocean and their characteristics, the fundamentals of wave and tides, as well as surface currents. Figure 23 is map of the world ocean showing the major ocean gyres and the surface currents that comprise them. Thermohaline or density driven circulation is also described in this chapter.

16. **SC.912.E.7.3:** Differentiate and describe the various interactions among Earth systems, including: atmosphere, hydrosphere, cryosphere, geosphere, and biosphere.

Remarks/Examples:

Interactions include transfer of energy (biogeochemical cycles, water cycle, ground and surface waters, photosynthesis, radiation, plate tectonics, conduction, and convection), storms, winds, waves, erosion, currents, deforestation and wildfires, hurricanes, tsunamis, volcanoes.

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

Justification:
The Earth's systems—geosphere, atmosphere, hydrosphere (including the cryosphere), and biosphere—are initially described on pp. 8-9, and illustrated in Figs. 3 (geosphere) and 4 (interdependence of Earth systems) (Chapter 1, Section 1). Various components of the geosphere are described in detail in Units 2 (Composition of Earth), and 3 (Surface Processes on Earth. Interactions of the geosphere with other Earth systems are detailed in the chapters on weathering, erosion and soil (Chapter 7), and mass movements, wind, and glaciers (Chapter 8). The hydrosphere is described in detail in Chapters 9 (surface water) and 10 (ground water). Section 1 of Chapter 10 (Movement and Storage of Groundwater), has a table (Table 1, p. 253) that summarizes the distribution and relative abundance of the various components of the world's water supply (oceans, ice caps & glaciers, groundwater, lakes, atmosphere, and rivers & streams. The atmosphere is discussed in detail in Chapter 11 (Atmosphere), and its interactions with other Earth systems is mentioned in descriptions of atmospheric composition, properties of the atmosphere, humidity, clouds and precipitation, and the water cycle (p. 303, Fig. 23).

17. **SC.912.E.7.4:** Summarize the conditions that contribute to the climate of a geographic area, including the relationships to lakes and oceans.

Remarks/Examples:
Describe how latitude, altitude, topography, prevailing winds, proximity to large bodies of water, vegetation and ocean currents determine the climate of a geographic area.

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

Justification:
Earth's climate is described in detail in Chapter 14 (Climate). Climate is defined on p. 376 as "the long-term weather patterns of an area," and the differences between weather and climate are also elucidated on this page. The causes of climate are described on p. 378-380 (latitude, effects of topography, and air masses) and illustrated in Figs. 2 (Latitude has a great effect on climate), 3 (Orographic lifting leads to rain on the windward side of a mountain), and 4 (air masses affect regional climates by transporting the temperature and humidity of their source regions). The Koppen Classification System of climate is described in Chapter 14, Section 2 (Climate Classification). The interaction between oceanic conditions and circulation and short-term climate changes is described in detail on pp. 388-389 in a section on the El Nino phenomenon.

18. **SC.912.E.7.5:** Predict future weather conditions based on present observations and conceptual models and recognize limitations and uncertainties of such predictions.

Remarks/Examples:
Use models, weather maps and other tools to predict weather conditions and differentiate between accuracy of short-range and long-range weather forecasts.

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

Justification:
The various methods that meteorologists use to predict weather are described in detail in Chapter 12 (Meteorology), Section 4 (Weather Analysis and Prediction). Station models used to predict surface weather conditions are described on p. 329-330 and illustrated in Fig. 17 (A station model shows temperature, wind direction and speed, and other weather data for a particular location at a particular time). The Problem-Solving Lab on p. 330 has students analyze a weather map. The different types of forecasts (digital forecasts, analog forecasts), and the differences between short-term forecasts and long-term forecasts are described on pp. 331-332.

19. **SC.912.E.7.6:** Relate the formation of severe weather to the various physical factors.

Remarks/Examples:
Identify the causes of severe weather. Compare and contrast physical factors that affect the formation of severe weather events (e.g. hurricanes, tornados, flash floods, thunderstorms, and drought).

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

Justification:
Severe weather is discussed in Chapter 13 (The Nature of Storms). The types of severe weather that are covered include: thunderstorms (how they form, incidence of thunderstorms, effects of moisture, lifting and stability, limits to growth, air-mass thunderstorms, frontal thunderstorms, stages of thunderstorm development, thunder, lightning, and safety), severe thunderstorms (supercells & hail), tornadoes (development of, classification, distribution, and safety), tropical cyclones (location, formation and stages of formation, movement, hazards, Saffir=Simpson Hurricane Wind Scale, damage, winds, storm surge, and safety), floods, droughts (heat waves, heat index), cold waves & windchill index. Fig. 14 is a full-page of illustrations on Visualizing Cyclone Formation. On p. 366, is a feature article on Storm Spotters. On p. 367, is a GeoLAB on tracking a tropical cyclone. There is a worksheet on Predicting Severe Weather that can be downloaded from the resources link and completed in class.

20. **SC.912.E.7.7:** Identify, analyze, and relate the internal (Earth system) and external (astronomical) conditions that contribute to global climate change.

Remarks/Examples:
Explain the possible natural (e.g. increased global temperature, wildfires, volcanic dust) and anthropogenic mechanisms (e.g. air pollution, acid rain, greenhouse gases, burning of fossil fuels) and the effects of these mechanisms on global climate change.

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

Justification:
The various aspects of climate change are described in detail in Chapter 14 (Climate), Section 3 (Climatic Changes). The chapter begins with discussion of long-term climate changes, such as the Pleistocene ice ages and continental glaciation. Short-term climate changes are addressed next with discussions of seasonal changes and El Nino events. Natural causes of climate changes that are described in detail include: solar activity (sunspots and the Maunder Minimum); climate and changes in Earth's orbit, Earth's tilt, and Earth's wobble; volcanic activity and its effect on short-term cooling events. Chapter 14 (Climate), Section 4 (Impact of Human Activities) details the effects of human activities on climate change. This section begins with a detailed description of the role of the greenhouse effect and global warming, which includes an illustration of the greenhouse effect (Fig. 1), and a MiniLAB on modeling the greenhouse effect in which students demonstrate the greenhouse effect using thermometers, a cardboard box and a glass jar. Global warming is discussed next and how carbon dioxide released from the burning of fossil fuels contributes to the greenhouse effect. Other human impacts that affect the global carbon cycle include deforestation. There is a one-page article on the effects of global warming on the Arctic (p. 396: Earth Science & Society). And, there is a GeoLAB at the end of the chapter where students design an experiment to measure microclimates near buildings, bodies of water, and other features.

21. **SC.912.E.7.8:** Explain how various atmospheric, oceanic, and hydrologic conditions in Florida have influenced and can influence human behavior, both individually and collectively.

Remarks/Examples:
Describe and discuss the conditions that bring about floods, droughts, wildfires, thunderstorms, hurricanes, rip currents, and tsunamis and how these conditions can influence human behavior (e.g. energy alternatives, conservation, migration, storm preparedness).

(●) **VERY GOOD ALIGNMENT** ( ) GOOD ALIGNMENT ( ) FAIR ALIGNMENT ( ) POOR ALIGNMENT ( ) VERY POOR/NO ALIGNMENT
Justification:
The conditions that bring about floods, droughts, wildfires, thunderstorms, and hurricanes, and the hazards and safety issues of these are described in Chapter 13 (The Nature of Storms). Human impacts that increase the susceptibility to tsunamis is discussed on p. 443. Rip currents and what you should do if caught in a rip current are described on p. 441.

22. **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 importance of the fossil record in documenting the origination and evolution of life on Earth is briefly discussed in Chapter 21 (Fossils and the Rock Record), Section 4 (Fossil Remains) starting on p. 606. More detailed discussion of the history of life on Earth is presented in Chapters 22-23. In Chapter 22 (The Precambrian Earth), Section 4 (Early Life on Earth) the following topics are discussed: the origin of life (Miller-Urey experiments which showed that the organic molecules that make up living organisms could be produced from inorganic molecules under natural conditions), RNA world, and Proterozoic life (early microbial life, first eukaryotes, multicellular life, Ediacaran biotas, mass extinction). The relevance of understanding Precambrian life forms to our search for life outside of Earth is described in an article on Martian Microenvironments (p. 638). Chapter 23 (The Paleozoic, Mesozoic and Cenozoic Eras) describes the evolution of life during these eras. Evolutionary patterns of life in the Paleozoic are described on pp. 652-654 (the diversification of multicellular life in the early Cambrian, the end Ordovician extinction, the late Devonian extinction, evolution of land plants, Carboniferous coal swamps, the end Permian extinction). Evolutionary patterns of life in the Mesozoic are described on pp. 658-659 (Mesozoic floras, evolution of terrestrial vertebrates, evolution of dinosaurs, the end Cretaceous extinction). Evolutionary patterns of life in the Cenozoic are described on pp. 665-??? (Ice Age mammals, evolution of modern humans). On p. 666 is an article that describes a paleontological field excavation of a Stegosaurus skeleton. The GeoLAB on p. 667 has students infer diets from photos of dinosaur skulls.

23. **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:
The scientific explanations for the origin of life on Earth are discussed in Chapter 22 (The Precambrian Earth), Section 4 (Early Life on Earth). The Miller-Urey experiments which demostrated that the organic molecules that make up living organisms could be produced from inorganic molecules under natural conditions are described, as well as the concept that the first life forms used RNA as an information molecule.

24. **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:
The Florida Standards for Literacy in Science are addressed in an array exercises & assignments that require the students to research and write about a diversity of topics. Throughout each chapter are assignments called Writing in Earth Science. These assignments ask students to write a paragraph or two on some topic. For example, on p. 577, the assignment is to research different nature trails in Florida

and write a journal entry describing what geological formations you might see along the trail. Another example on p. 666, asks the students to make a model of their favorite fossil and to write description of the fossil with details about the environment in which it was found/lived. The Florida Mathematical Practices are addressed throughout the text. The Math in Earth Science exercises ask students to calculate a quantity or analyze data. For example, on p. 446, students are asked to calculate how many years it will take for the city of Orlando (at 32 m elevation) to be submerged using a sea level rise rate of 3 mm/y. The Data Analysis Lab on p. 18, asks the students to plot the change in average surface temperature over time using a data table, convert the temperature values from degrees K to degrees C, determine average temp in 1988, then to extrapolate average surface temp for 2100. The MiniLAB on p. 416 has students determine the relative chemical composition of artificial seawater (%) using on a list of the chemical ingredients by weight that are to be dissolved in 965.67 g of water. The students then calculate the salinity in parts per thousand (ppt) of the final artificial seawater solution. An example of a Problem-solving Lab is an exercise on how to make and use a graph (p. 565). In this assignment, students construct a graph of the amount of isostatic rebound over a period of 8000 years, and describe the graph, identify trends in the data, predict future trends, and compare and contrast isostatic rebound from mountain erosion vs. deglaciation.

25. **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:
Students are asked to read, interpret, and examine the credibility and validity of scientific claims in different sources of information throughout the text in a variety of different assignments and exercises. For example, on p. 897, students are asked to analyze media sources, and answer questions on the credibility of the information, potential bias in reporting, etc.

26. **SC.912.N.1.5:** Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.

Remarks/Examples:

Recognize that contributions to science can be made and have been made by people from all over the world.

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

Justification:
Timelines of human contributions to science are included in each chapter which emphasize the contributions from people all over the world. For example, Fig. 15 on pp. 98-99 highlight Mineral Use through Time. Examples of contributions include: Chinese alchemists combine saltpeter with sulfur and carbon to make gunpowder (800-900), and South American silver mines help establish

27. **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:
Students are asked to collect data and use tables and graphs to draw conclusions and make inferences base on patterns or trends in the data in a variety of contexts throughout the text. For example, the Data Analysis Lab on p. 182, asks the students to determine soil texture from a table of the relative concentrations of clay, silt and sand and infer characteristics of the soil based on the composition. The Problem-solving Lab on p. 565 has students construct a graph of the amount of isostatic rebound over a period of 8000 years, and describe the graph, identify trends in the data, predict future trends, and compare and contrast isostatic rebound from mountain erosion vs. deglaciation. The end of chapter Assessment frequently have the students interpret graphs or tables. For example, on p. 108, students are asked to answer 2 questions using a table of mineral characteristics, as well as answer 2 additional questions using a table of mineral hardness.

28. **SC.912.N.2.4:** Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.

Remarks/Examples:

Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.

Florida Standards Connections: MAFS.K12.MP.1: Make sense of problems and persevere in solving them 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:
This standard is addressed specifically in Chapter 1 (The Nature of Science), Section 2 (Methods of Science).

29. **SC.912.N.2.5:** Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.

Remarks/Examples:
Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
This standard is addressed specifically in Chapter 1 (The Nature of Science), Section 2 (Methods of Science).

30. **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:
This standard is addressed specifically in Chapter 1 (The Nature of Science), Section 2 (Methods of Science).

31. **SC.912.N.3.5:** Describe the function of models in science, and identify the wide range of models used in science.

Remarks/Examples:
Describe how models are used by scientists to explain observations of nature.

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

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
This standard is addressed specifically in Chapter 1 (The Nature of Science), Section 2 (Methods of Science).

32. **SC.912.N.4.1:** Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.

Remarks/Examples:
Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.

MAFS.K12.MP.1: Make sense of problems and persevere in solving them, and MAFS.K12.MP.2: Reason abstractly and quantitatively.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
This standard is addressed specifically in Chapter 1 (The Nature of Science), Section 2 (Methods of Science).

33. **SC.912.P.10.4:** Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Heat as the energy transferred by convection, conduction, and radiation is explained in Chapter 11 (Atmosphere) and Chapter 17 (Plate Tectonics). The connection of heat to change in temperature or states of matter is covered in Chapter 3 (Matter and Change), Section 3 (State of Matter).

34. **SC.912.P.10.10:** Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).

Remarks/Examples:
Recognize and discuss the effect of each force on the structure of matter and the evidence for it.

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

Justification:
The magnitude and range of gravitational and electromagnetic forces are discussed throughout the text. I could not find specific mention of the weak nuclear and strong nuclear forces, although radioactive decay is discussed in Chapter 21 in a section that explains how radiometric dating is used to estimate the ages of rocks.

35. **SC.912.P.10.11:** Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.

Remarks/Examples:
Identify the three main types of radioactive decay (alpha, beta, and gamma) and compare their properties (composition, mass, charge, and penetrating power). Explain the concept of half-life for an isotope (e.g. C-14 is used to determine the age of objects) and calculate the amount of a radioactive substance remaining after an integral number of half-lives have passed. Recognize that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions due to the large amount of energy related to small amounts of mass by equation E=mc^2.

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

Justification:
The radioactive decay of unstable isotopes is described and illustrated on p. 601 in Chapter 21, Section 3 (Absolute-Age Dating). The online text includes a link to an animation of alpha decay. Radiometric dating and the concept of half-life is discussed and illustrated on p. 602. The online version of the text includes an animation of half-lives. There is also an animation of how archaeologists used C-14 dating to determine the age of some archaeological objects. Nuclear fission is discussed in a section on Nuclear Energy in Chapter (Energy Resources).

36. **SC.912.P.10.16:** Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.

Remarks/Examples:
Explain that moving electric charges produce magnetic forces and moving magnets produce electric forces. Recognize the Lorentz force is the force on a point charge due to electromagnetic fields and occurs in many devices, including mass spectrometers.

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

Justification:
The concept of Earth's magnetic field and the utility of paleomagnetism in determining the spreading rates of oceanic plates is discussed in Chapter 17 (Plate Tectonics). The magnetic fields of Earth and its moon, and the sun are discussed in Chapter 27 (The Sun-Earth-Moon System). The magnetic fields of other planets in our solar system are discussed in Chapter 28 (Our Solar System). The magnetic fields in vicinity of black holes is discussed in Chapter 30 (Galaxies and the Universe).

37. **SC.912.P.10.18:** Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.

Remarks/Examples:
Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy.

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

Justification:
The electromagnetic spectrum is described on p. 764 in Chapter 27 (The Sun-Earth-Moon System). The different parts of the electromagnetic spectrum (radio waves, microwaves, infrared, visible light, ultraviolet, x rays & gamma rays) are described in terms of wavelength and frequency.

38. **SC.912.P.10.19:** Explain that all objects emit and absorb electromagnetic radiation and distinguish between objects that are blackbody radiators and those that are not.

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

Justification:
The concept of electromagnetic radiation is introduced in the section on the Tools of Astronomy in Chapter 27 (The Sun-Earth-Moon System). There is an Applying Practices assignment on Blackbody Radiators that can be downloaded. The assignment defines an ideal blackbody radiator, and asks students to work in groups to research blackbody radiators, explain which objects emit and absorb electromagnetic radiation, and give a 5-10 presentation on blackbody radiators.

39. **SC.912.P.10.20:** Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.

Remarks/Examples:
Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, period, reflection and refraction) and explain the relationships among them. Recognize that the source of all waves is a vibration and waves carry energy from one place to another. Distinguish between transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves). Describe sound as a longitudinal wave whose speed depends on the properties of the medium in which it propagates.

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

Justification:
The measurable properties of waves are described in Chapter 15 (Earth's Oceans), Section 3 (Ocean Movements). The components of a wave, specifically ocean waves (crest, trough, wavelength, height, wave base, still water level) are defined on p. 421-422 and illustrated in Figs. 17 & 18. Seismic waves are discussed in Chapter 19 (Earthquakes). Primary (P-waves or compressional waves), secondary (S-waves), and surface waves are described and illustrated on p. 532 and in Fig. 5. There is also an animation of seismic waves that illustrates these principles. Brief discussions of sound waves are included in: Chapter 2 (Mapping Our World) in the section on sonar, and Chapter 15 (Earth's Oceans) in a section on side-scan sonar.

40. **SC.912.P.12.2:** Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.

Remarks/Examples:
Solve problems involving distance, velocity, speed, and acceleration. Create and interpret graphs of 1-dimensional motion, such as position versus time, distance versus time, speed versus time, velocity versus time, and acceleration versus time where acceleration is constant.

Florida Standards Connections: MAFS.912.N-VM.1.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors.

VERY GOOD ALIGNMENT **GOOD ALIGNMENT** FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Students are asked to calculate velocity in the Math in Earth Science (p. 507) exercise, in which students are asked to calculate the velocity of the movement of the Pacific Plate given that it has moved 500 km in the last 4.7 million years. In the Document-based Questions (p. 857) exercise, students are asked to interpret a graph of the radial velocity of binary stars. In the Problem-solving Lab (p. 874), students are asked to graph the speed (km/s) of the movement of galaxies vs. distance (Mpc) in order to calculate the Hubble Constant.

41. **SC.912.P.12.4:** Describe how the gravitational force between two objects depends on their masses and the distance between them.

Remarks/Examples:
Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the inverse square of the distance between them.

VERY GOOD ALIGNMENT GOOD ALIGNMENT FAIR ALIGNMENT POOR ALIGNMENT VERY POOR/NO ALIGNMENT
Justification:
Newton's Law of Universal Gravitation is described and the corresponding mathematical formula given on p. 802.

42. **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:
Throughout the text, students are asked to conduct research on various topics by reading science and technical texts. For example, the combined GeoLAB and Writing in Earth Science exercises on p. 103, students are asked to research and write a field guide to minerals using sources in the library or on the Internet. The Writing in Earth Science on p. 428 asks students to research the health of the beaches in Florida and write a news story, and present it the class, explaining results of scientific studies and why these results are important to swimmers. Another Writing in Earth Science on p. 152 asks the students to research information on the types of rocks used to build structures in Florida, and then use the information to write a promotional brochure.

43. **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:
Throughout the textbook, students are asked to summarize the central ideas of the readings. For example, in the Reading Check on p. 114, the students are asked to summarize the formation of magma that has a different chemical composition from the original rock. In the Reading Check on p. 135, the students are asked to summarize what occurs during erosion. In the Reading Check on p. 265, the students are asked to summarize why freshwater is Earth's most precious natural resource.

44. **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:
Many of the LAB exercises ask the students to follow a complex multistep process when performing the lab. For example, the GeoLAB on p. 21, asks students to follow a 12-step procedure in order to calculate the specific gravity of rock samples by measuring the volumes of the samples by water displacement and using a scale to measure their masses. The MiniLAB on p. 136 asks the students to model sediment layering by following an 8-step procedure. The GeoLAB on p. 185 asks the students to model mineral weathering by soaking halite chips in water by following a 13-step procedure, and recording their observations in a table.

45. **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:
Throughout the text, students are asked to determine the meaning of symbols in topographic maps (GeoLAB, p. 48), in scientific illustrations

(Problem-solving Lab, p. 70), and weather maps (GeoLab, p. 334). In other situations, students are asked to interpret the meaning of terms related to scientific processes in diagrams and illustrations. For example, in the Visualizing Seismic Waves (p. 537) illustration, students must trace the paths of P-waves and S-waves generated by an earthquake on cross-sections of the Earth in order to understand how the different paths have been used to determine the composition of the Earth's inner core, outer core, and mantle.

46. **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 activities in the MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs.

47. **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 activities in the MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs.

48. **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 activities in the MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs.

49. **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 activities in the MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs.

50. **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 activities in the MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs.

51. **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:
Students are asked to perform the above activities in the MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs.

52. **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:
Students are asked to work together in groups to carry out labs (MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs) and present their results.

53. **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 work together in groups to carry out labs (MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs) and present their results in diversity of formats, such as posters and oral presentations.

54. **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 work together in groups to carry out labs (MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs) and present their results in diversity of formats, such as posters and oral presentations.

55. **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 work together in groups to carry out labs (MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs) and present their results in diversity of formats, such as posters and oral presentations.

56. **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 work together in groups to carry out labs (MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs) and present their results in diversity of formats, such as posters and oral presentations.

57. **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 work together in groups to carry out labs (MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs) and present their results in diversity of formats, such as posters and oral presentations.

58. **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 research a topic and summarize their conclusions in the Writing in Earth Science exercises.

59. **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 research a topic and summarize their conclusions in the Writing in Earth Science exercises.

60. **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 research a topic and summarize their conclusions in the Writing in Earth Science exercises.

61. **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 research a topic and summarize their conclusions in the Writing in Earth Science exercises. For example, on p. 698, students asked to use the internet to research information about sustainable water use in Florida, and write an essay explaining if one's city's water usage is sustainable.

62. **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 research a topic and summarize their conclusions in the Writing in Earth Science exercises. For example, on p. 698, students asked to use the internet to research information about sustainable water use in Florida, and write an essay explaining if one's city's water usage is sustainable.

63. **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 research a topic and summarize their conclusions in the Writing in Earth Science exercises. For example, on p. 428, students are asked to research the health of beaches in Florida, write a story for the nightly news about environmental issues associated with beaches, and present the story to the class, explaining results of scientific studies and why these results are important to swimmers.

64. **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:
Students are asked to research a topic and summarize their conclusions in the Writing in Earth Science exercises. For example, on p. 428, students are asked to research the health of beaches in Florida, write a story for the nightly news about environmental issues associated with beaches, and present the story to the class, explaining results of scientific studies and why these results are important to swimmers.

65. **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 write routinely over extended and shorter frames. For example, the Writing in Earth Science activities students are asked to research a topic and write up their results in a variety of formats. For example, on p. 396, students are asked to research information about the effects of climate change on the state of Florida and prepare a display for a bulletin board that explains several examples and includes either illustrated figures or photos. On p. 757, students are asked to write a radio announcement as part of an Earth Day celebration to encourage the public to be mindful of the potential negative effects human activity can have on Earth.

66. **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:
Students are asked to use units to solve problems in the Data Analysis Labs. For example, on p. 18, students are asked to construct a graph of the average surface temperature on Earth over the past 125 years. In the Data Analysis lab on p. 377, students are asked to plot the calculate and plot the monthly average temperature values for Phoenix, AZ. In the Data Analysis on p. 423, students are asked to plot hourly tidal gauge data over a 24-hour period in order to identify the tidal cycle.

67. **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:
Students are asked to choose a level of accuracy appropriate to limitations on measurement when reporting quantities in several of the labs-- MiniLabs, GeoLabs, Data Analysis Labs, Launch Labs, and Problem-solving Labs.

68. **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:
Resources available for English language learners include a bilingual glossary in the back of the text, and a multi-lingual glossary that can be downloaded from the resources website. In addition, most of the concepts introduced in the text are accompanied by illustrations and diagrams that can be interpreted without reading.

69. **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:
English language learners work together with native English speakers on group projects which gives all students the opportunity to practice their conversational skills and learn in a supportive instructional environment.