

Grade 10 Informational Mini-Assessment

“The Force”

This grade 10 mini-assessment is based on the text “The Force,” an excerpt from *Furious Earth: The Science and Nature of Earthquakes, Volcanoes, and Tsunamis* by Ellen J. Prager. This text is considered to be worthy of students’ time to read and also meets the expectations for text complexity at grade 10. Assessments aligned to the Common Core State Standards (CCSS) will employ quality, complex texts such as this one. Because the topic of the text is scientific, the mini-assessment will measure both Reading Standards for Informational Text as well as Reading Standards for Literacy in Science and Technical Subjects.

Questions aligned to the CCSS should be worthy of students’ time to answer and therefore do not focus on minor points of the text. Questions also may address several standards within the same question because complex texts tend to yield rich assessment questions that call for deep analysis. In this mini-assessment there are eight questions that address the Reading Standards below. There is also one constructed response question that addresses the Reading, Writing, and Language Standards.

We encourage educators to give students the time that they need to read closely and write to the source. While we know that it is helpful to have students complete the mini-assessment in one class period, we encourage educators to allow additional time as is necessary.

The questions align to the following standards:

RI.9-10.1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
RI.9-10.2	Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.
RI.9-10.3	Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.
RI.9-10.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).
RI.9-10.5	Analyze in detail how an author’s ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).
RI.9-10.7	Analyze various accounts of a subject told in different mediums (e.g., a person’s life story in both print and multimedia), determining which details are emphasized in each account.
RST.9-10.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

RST.9-10.2	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.
RST.9-10.6	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.
RST.9-10.7	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.
W.9-10.2	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
W.9-10.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
W.9-10.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.
L.9-10.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
L.9-10.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
L.9-10.3	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

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The assessment questions in this document align with the CCSS and reflect the instructional shifts implied by the standards. To learn more about these topics, please go to the following link:

www.achievethecore.org

Grade 10 Mini-Assessment – “The Force”

Today you will read a passage about plate motion and its effect on Earth’s surface. You will then answer several questions based on the text. I will be happy to answer questions about the directions, but I will not help you with the answers to any questions. You will notice as you answer the questions that some of the questions have two parts. You should answer Part A of the question before you answer Part B, but you may go back and change your answer to Part A if you want to.

Take as long as you need to read and answer the questions. If you do not finish when class ends, come see me to discuss the ways you may have additional time.

Now read the passage and answer the questions. I encourage you to write notes in the margin as you read the passages.

The Force

An excerpt from *Furious Earth: The Science and Nature of Earthquakes, Volcanoes, and Tsunamis*
by Ellen J. Prager

- 1 Ever since the early continental drift and plate tectonic theories were proposed, scientists have struggled to understand why and how lithospheric plates move. Even today our understanding of the forces that drive plate motions is rudimentary. Much of the difficulty arises from the fact that we have no method to view directly the planet’s interior or test relevant theories. None of the presently proposed mechanisms of plate motion seem to explain all aspects of plate movement, but for now, they are our best guess based on the available evidence.
- 2 Plate motion appears to be driven mainly by convection within Earth’s mantle layer and by pull from plate subduction (Figure 1.9). . . . The asthenosphere, a thin layer in the upper mantle, is believed to be partially molten. Heat from deep within the Earth is thought to cause very slow convection currents in the partially molten or fluidlike asthenosphere (or possibly below it). Convection, a means of heat transfer, occurs when a temperature increase causes a liquid or gas to expand, become less dense, and rise within the surrounding material. As the substance rises, heat is transferred to the surrounding material. The colorful motion in a lava lamp is a product of convection. At the lamp’s base, heat from a light warms colored wax in a surrounding oil mixture. As the wax heats up, it becomes less dense than the nearby oil and

rises. Near the top of the lamp, away from the source of heat, the wax cools, becomes more dense, and sinks back to the bottom of the lamp.

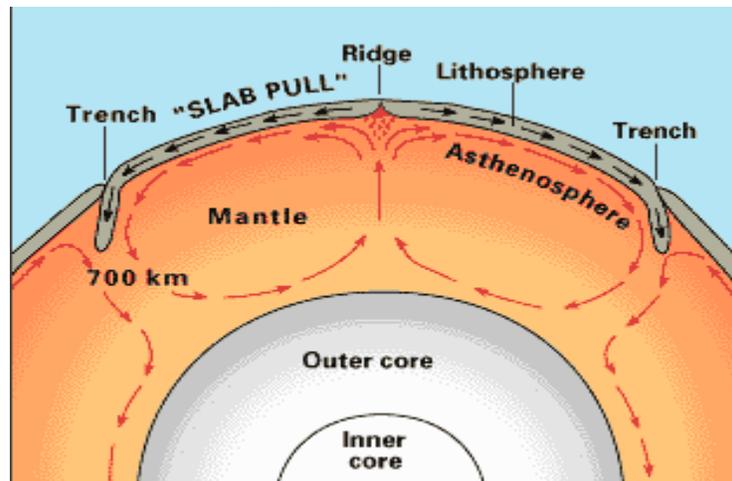


Figure 1.9: Convection and slab pull in Earth's mantle and asthenosphere

- 3 The heat source for convection within the asthenosphere comes from deep within Earth's interior, fueled by the decay of naturally radioactive materials (e.g. uranium, plutonium, and thorium) and heat from the early formation of the planet. In a simplistic, conceptual model of what must be a spatially complex and dynamic system, we envision a series of convection cells within the asthenosphere. Uneven heating causes thermal plumes to rise at mid-ocean ridges and cooling near the surface creates descending plumes at subduction zones. In between, the asthenosphere is thought to move horizontally from beneath a spreading center, a ridge, to a subduction zone, a trench. Friction between the lithosphere and the underlying asthenosphere acts like glue, and the lithospheric plates are dragged along by the motion of the asthenosphere. To envision how Earth's rocky mantle could flow almost like a fluid, think of the child's toy Silly Putty. When molded tightly into a ball, a large mass of the squishy stuff will bounce like a solid off a hard surface. But if placed in one spot for an hour or more, the Silly Putty, like a very thick fluid, will gradually spread out over the surface. It acts like a solid on a short time scale, and a fluid over longer periods. Mantle convection may be similar, flowing very slowly over a very long period.
- 4 At subduction zones, gravity pulls the slabs of cold, dense oceanic crust down into the mantle. This process is now believed to play a major role in plate motion, as it results in the entire plate being pulled along with the descending slab. In the past, scientists also speculated that the formation of a new crust at the spreading ridges pushed the plates apart. Now most believe that the horizontal force created during

spreading is minor compared to the “slab pull” at the subduction zones or convection within the asthenosphere. The source of plate motion will undoubtedly be the focus of scientific study and debate well into the future.

The Evolving Surface

- 5 For hundreds of millions of years, plate tectonics has been at work, and Earth’s surface has been evolving and changing shape. Continents have collided to form mountains, oceans have been born, and large sections of the planet’s crust have been obliterated in subduction zones. Because of the recycling of Earth’s outer skin, the oldest ocean crust is only 180 million years old. This makes it difficult to reconstruct what the planet’s surface looked like earlier than about 200 million years ago. Scientists must rely on rocky clues from the much older continents. For instance, the Appalachian Mountains along the East Coast of North American are thought to represent the suture zone¹ of a powerful plate collision that occurred some 500 million years ago.

- 6 Scientists now speculate, reviving Wegener’s once-rejected theory², that relatively early in Earth’s history, some 600 million years ago, the continents were joined as one large land mass, aligned along the equator. Over time and through the movement of the tectonic plates, the continents split apart and shifted. However, by about 225 million years ago, the continents had once again come together to form another supercontinent, which geologist have named Pangea, and one universal ocean, known as Panthalassa (Figure 1.10). Evidence suggests that by about 200 million years ago, the supercontinent had again been ripped apart, this time forming two major continents and a smaller sea, the Tethys. By 135 million year ago, India, Antarctica, and Australia had broken away from the other continents, and a major restructuring of Earth’s surface took place. During the next 70 million years, the Atlantic Ocean formed, India moved menacingly northward toward Asia, and Africa rotated counterclockwise. Eventually, India collided with Asia, Australia moved northward, North and South America became attached, and the Atlantic and Indian Oceans widened. Today, we see a distribution of the continents and ocean that reflects a very busy past. However, what we see today is by no means the conclusion of a long-drawn-out tale. Through sea floor spreading, the Atlantic and Indian

¹ **Suture:** A place where two or more things are joined

² **Wegener’s theory:** Alfred Wegener (born 1880) theorized that the continents are slowly drifting around Earth.

Oceans continue to widen, while the Pacific shrinks. Africa is being split in two at the East African Rift, and the Mediterranean is getting smaller. As time moves on, so will Earth's tectonic plates. Their motion will continue to shape and change the planet's surface, and the jostling and grinding of their edges will inevitably produce powerful volcanic eruptions, cause strong earthquakes, and trigger towering tsunamis.

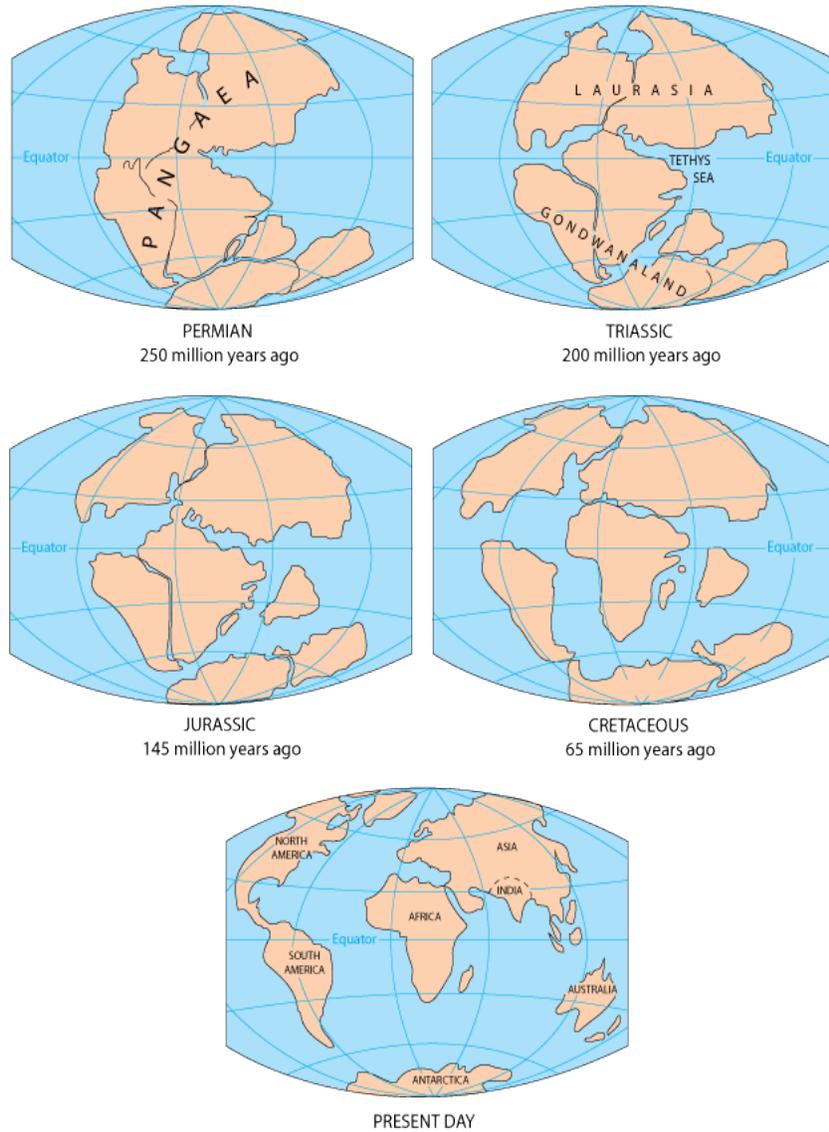


Figure 1.10: The approximate position of the continents through time, 225 million years ago to the present. Courtesy of the U.S. Geological Survey.

From *Furious Earth: The Science and Nature of Earthquakes, Volcanoes, and Tsunamis* by Ellen J. Prager, Ph.D. Copyright © 2000 by Ellen J. Prager. Used by permission of McGraw-Hill Education.

QUESTIONS

1. This question has two parts. Answer Part A and then answer Part B.

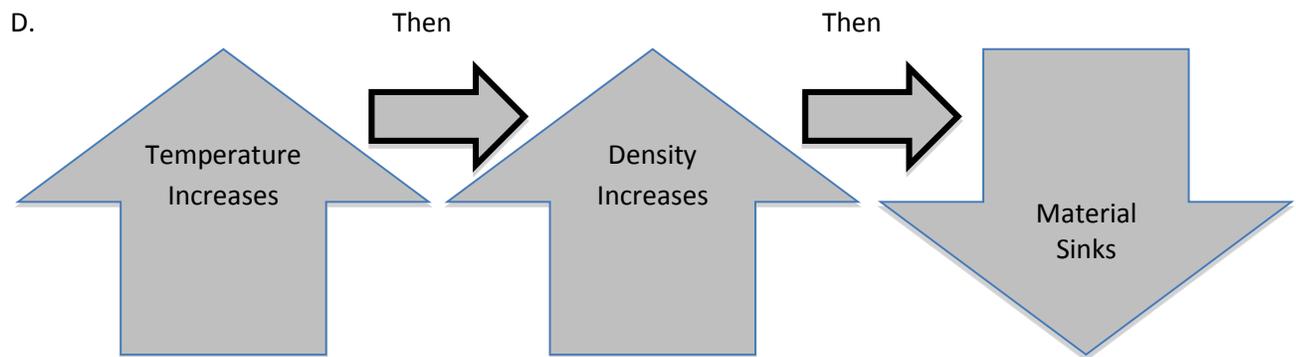
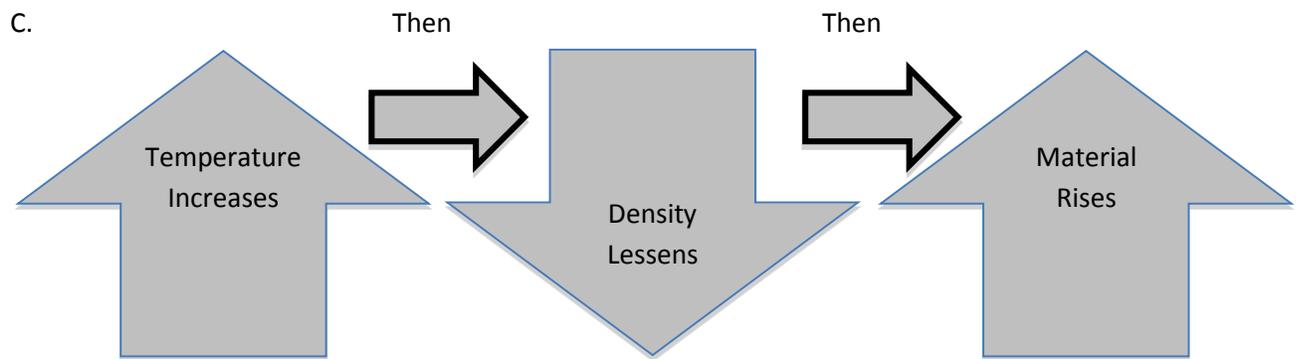
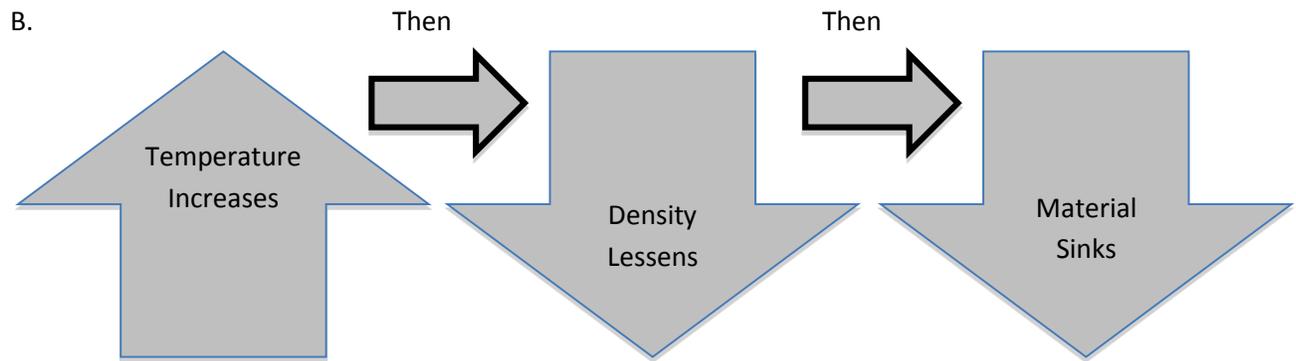
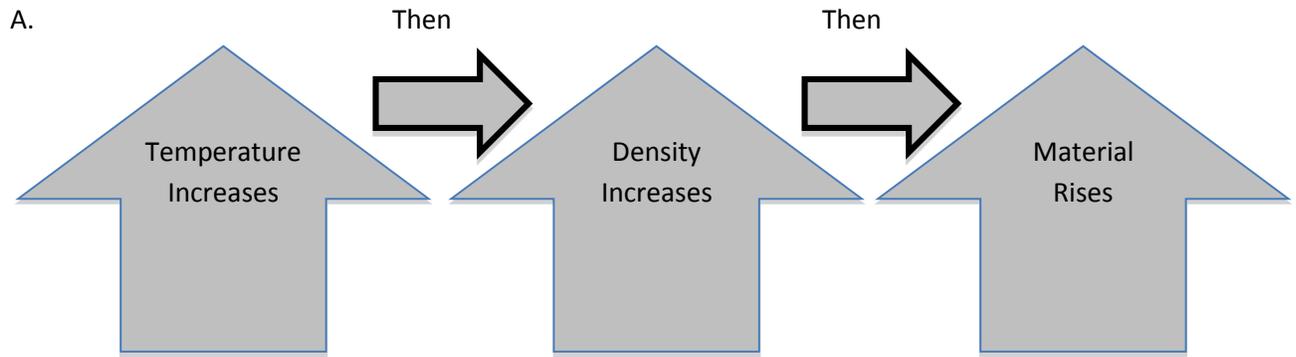
Part A: What is the meaning of *rudimentary*, as it is used in paragraph 1?

- A. inquisitive, curious
- B. challenging, complicated
- C. scientific, experimental
- D. basic, underdeveloped

Part B: Which phrase from paragraph 1 best helps the reader to determine the meaning of *rudimentary*?

- A. “have struggled to understand”
- B. “how lithospheric plates move”
- C. “forces that drive plate motion”
- D. “test relevant theories”

2. Which graphic correctly represents the process of convection as described in paragraph 2?



3. This question has two parts. Answer Part A and then answer Part B.

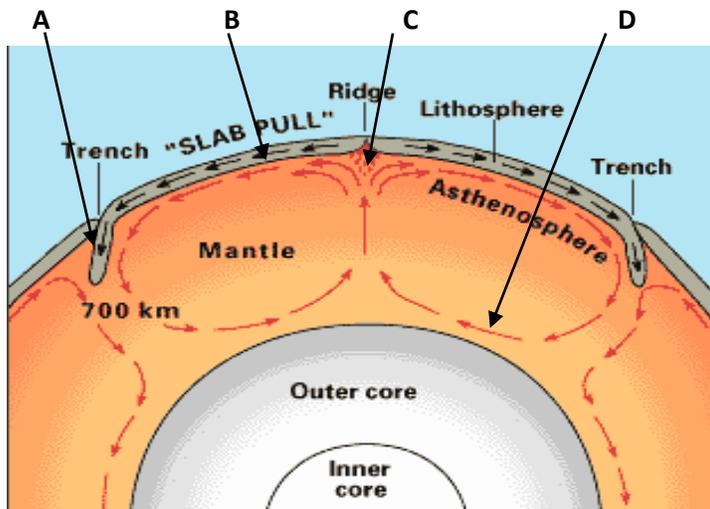
Part A: What does Figure 1.9 demonstrate to the reader about the lithosphere?

- A. In the lithosphere, movement is slower than in the asthenosphere.
- B. The lithosphere moves in the same direction as the layers just beneath it.
- C. Convection distributes heat equally among the layers of the planet, including the lithosphere.
- D. The lithosphere is made of the same materials as the inner core.

Part B: Which statement from paragraph 3 of the passage best supports the answer from Part A?

- A. “The heat source for convection within the asthenosphere comes from deep within Earth’s interior, fueled by the decay of naturally radioactive materials (e.g. uranium, plutonium, and thorium) and heat from the early formation of the planet.”
- B. “Uneven heating causes thermal plumes to rise at mid-ocean ridges and cooling near the surface creates descending plumes at subduction zones.”
- C. “In between, the asthenosphere is thought to move horizontally from beneath a spreading center, a ridge, to a subduction zone, a trench.”
- D. “Friction between the lithosphere and the underlying asthenosphere acts like glue, and the lithospheric plates are dragged along by the motion of the asthenosphere.”

4. Based on the information in the text, which option below points to a subduction zone?



5. This question contains two parts. Answer Part A and then answer Part B.

Part A: What rhetorical strategy does the author use to illustrate complex concepts?

- A. The author gives concrete examples involving everyday objects.
- B. The author uses anecdotes from personal experience.
- C. The author summarizes the most important ideas later in the passage.
- D. The author compares many theories to illustrate the lack of definitive knowledge.

Part B: Draw a ring around two excerpts from the passage that prove the answer to Part A.

6. Throughout the passage, the author emphasizes that scientists are not finished learning about the behavior and history of Earth, in some part due to specific challenges that affect their ability to study aspects of our planet. Based on the information provided in the passage, complete the chart by using your own words to explain why scientists face each challenge.

Challenges Scientists Face	Reason for These Challenges
<p>Challenge A: Understanding how and why plate motion occurs</p>	<p>Reason for Challenge A:</p>
<p>Challenge B: Conceptualizing the structure of Earth hundreds of millions of years ago</p>	<p>Reason for Challenge B:</p>

7. After reading the passage, which two conclusions can the reader correctly make about the Earth?
- A. Changes in temperature of layers below Earth’s surface have a significant effect the surface of the Earth.
 - B. The size and shape of Earth’s sea floor remain unaffected by plate movement.
 - C. There have been recent updates to the major theories scientists accept about the surface of the Earth.
 - D. At some point, the process causing Earth to recycle its outer layers will take less time.
 - E. Scientists speculate that a supercontinent will form on Earth again sometime in the next few years.
 - F. The process of convection inside the Earth’s layers is a relatively simple one.

8. Reread the following sentence from paragraph 3:

In a simplistic, conceptual model of what must be a spatially complex and dynamic system, we envision a series of convection cells within the asthenosphere.

In what two ways does this sentence help the author develop the ideas in the passage?

- A.** The sentence introduces the author's explanation of the current theory of plate tectonics.
- B.** The sentence helps provide the meaning of technical words important to the passage.
- C.** The sentence is the pivot point in the passage between a description of the causes of continental drift and a description of the effects of drift.
- D.** The sentence is the general thesis statement for the passage, summarizing the central ideas.
- E.** The sentence serves as a warning that the model presents the process in a way that is less complicated than what scientists think could be the actual process.
- F.** The sentence is used as evidence to develop the idea that our understanding of tectonics is well developed.

Information for Teachers: Quantitative and Qualitative Analyses of the Text

Regular practice with complex texts is necessary to prepare students for college and career readiness. The excerpt for this mini-assessment is placed at grade 10 for the purpose of this exemplar. This section of the exemplar explains the process that was used to place the text at grade 10 and the reasons that it meets the expectations for text complexity in Reading Standard 10. “Appendix A of the Common Core” and the “Supplement to Appendix A: New Research on Text Complexity” lay out a research-based process for selecting complex texts.

1. Place a text or excerpt within a **grade band** based on at least one³ quantitative measure according to the research-based conversion table provided in the “Supplement to Appendix A: New Research on Text Complexity” (www.corestandards.org/resources).
2. Place a text or excerpt at a **grade level** based on a qualitative analysis.

“The Force”	Quantitative Measure #1	Quantitative Measure #2
	Flesch-Kincaid: 11.7	Reading Maturity: 10.3

After gathering the quantitative measures, the next step is to place the quantitative scores in the Conversion Table found in the “Supplement to Appendix A” (www.corestandards.org/resources) and determine the **grade band** of the text. **NOTE: With scientific texts, there are often many scientific terms that drive the readability ratings up. Careful attention should be paid to the complexity of the topic itself in these cases so that the scientific terms do not force the passage into a grade level that is too high for the concepts.** Figure 1 reproduces the conversion table from the Supplement to Appendix A, showing how the initial results from Flesch-Kincaid and the Reading Maturity measure were converted to grade bands.

Figure 1: Updated Text Complexity Grade Bands and Associated Ranges from Multiple Measures⁷

Common Core Band	ATOS	Degrees of Reading Power [®]	Flesch-Kincaid ³	The Lexile Framework [®]	Reading Maturity	SourceRater
2 nd – 3 rd	2.75 – 5.14	42 – 54	1.98 – 5.34	420 – 820	3.53 – 6.13	0.05 – 2.48
4 th – 5 th	4.97 – 7.03	52 – 60	4.51 – 7.73	740 – 1010	5.42 – 7.92	0.84 – 5.75
6 th – 8 th	7.00 – 9.98	57 – 67	6.51 – 10.34	925 – 1185	7.04 – 9.57	4.11 – 10.66
9 th – 10 th	9.67 – 12.01	62 – 72	8.32 – 12.12	1050 – 1335	8.41 – 10.81	9.02 – 13.93
11 th – CCR	11.20 – 14.10	67 – 74	10.34 – 14.2	1185 – 1385	9.57 – 12.00	12.30 – 14.50

³ For higher stakes tests, it is recommended that two corresponding text complexity measures be used to place a text in a grade band. When two measures are used, both placing the text in the same **band**, the results provide additional assurance that the text selected is appropriate for the band.

To find the **grade level** of the text within the designated grade band, engage in a systematic analysis of the characteristics of the text. The characteristics that should be analyzed by doing a qualitative analysis can be found in Appendix A of the CCSS. (www.corestandards.org).

Qualitative Analysis	"The Force"	Where to place within the band?					
Category	Notes and comments on text, support for placement in this band	Too Low	Early-mid 9	Mid-end 9	Early-mid 10	End 10	NOT suited to band
Structure: (both story structure or form of piece)	This passage is mainly organized by cause and effect, including the effect of convection on plate motion and the effect of plate tectonics on the Earth's surface. Text features such as headings and illustrations enhance the reader's understanding of the subject. The graphics are essential to both directly supporting the text and aiding student understanding.						
Language Clarity and Conventions	The language in the text is explicit and straightforward. Although most of the vocabulary can be expected to be accessible to tenth grade students, some of the scientific terms may present challenges. There are many complex and compound sentences in the text, with some containing multiple concepts, particularly in paragraphs 3 and 6. The use of standard punctuation will enable students to navigate through it reasonably well.						
Knowledge Demands (life, content, cultural/literary)	The text includes moderate levels of discipline-specific content knowledge. To understand the text, it would be helpful for students to have some basic geology knowledge (plates, layers of the Earth). Wegener's theory is explained when referenced in paragraph 6. Abstract concepts, like convection, friction, and viscosity are explained and illustrated with concrete examples.						
Levels of Meaning (chiefly literary)/ Purpose (chiefly informational)	The main purpose of the text is implicit but readily accessible: Plate motion has had significant impact on the Earth's surface, and the text explains a simplified model of a current theory, as well as giving a brief history of plate movement.						
Overall placement: Grade 10	Justification: This text is moderately complex in regard to sentence structure, vocabulary, and knowledge demands. The domain-specific vocabulary may be challenging, but is still likely to be accessible to the average 10th grader. This mini-assessment may be most appropriate for advanced tenth graders early in the year, all tenth graders later in the year, or even 11th graders in their first semester.						

Question Annotations & Correct Answer and Distractor Rationales

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
1 Part A	D	RI.9-10.4, RI.9-10.1	<p>A. "Inquisitive" and "curious" describe the scientists who study plate motion rather than their understanding of plate movement.</p> <p>B. "Challenging" and "complicated" describe the science of plate movement rather than the scientists' basic understanding of it.</p> <p>C. "Scientific" and "experimental" refer to the study of plate movement rather than the scientists' basic understanding of it.</p> <p>D. This is the correct response. "Basic" and "underdeveloped" describe the current understanding of plate motion, based on the author's description of scientists' limited knowledge.</p>
1 Part B	A		<p>A. This is the correct response. "Have struggled to understand" implies that scientists have a limited understanding of plate motion.</p> <p>B. "How lithospheric plates move" explains the specific aspect of plate movement that scientists do not understand rather than their limited knowledge of plate motion.</p> <p>C. "Forces that drive plate motion" describe the topic scientists study rather than the extent of their knowledge.</p> <p>D. "Test relevant theories" refers to one of the challenges that results in scientists' limited understanding rather than their general knowledge of plate motion.</p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
2	C	RST.9-10.7, RST.9-10.1	<p>A. In the convection process, the density of a substance decreases rather than increases.</p> <p>B. In the convection process, the decreasing density of the material causes it to rise rather than sink.</p> <p>C. This is the correct response. According to paragraph 2, a temperature increase causes the density of a substance to decrease, causing the material to rise within the surrounding substance.</p> <p>D. In the convection process, the density of the substance decreases and the substance rises.</p>
3 Part A	B	RST.9-10.7, RST.9-10.1	<p>A. Although the figure does indicate the movement of the lithosphere and asthenosphere, it indicates only the direction of movement, not the speed.</p> <p>B. This is the correct answer. The arrows indicating movement in the lithosphere mirror the arrows in the asthenosphere, showing that the movement of the lithosphere correlates to the movement of the layers just beneath it.</p> <p>C. The diagram only shows the redistribution of heat within the mantle.</p> <p>D. The figure does not include information about the materials found in these layers.</p>
3 Part B	D		<p>A. This statement focuses on the asthenosphere rather than the lithosphere.</p> <p>B. Although this statement refers to the lithosphere, it focuses on the effects of heat within the layer, rather than the direction of its movement.</p> <p>C. This statement focuses on the asthenosphere rather than the lithosphere.</p> <p>D. This is the correct response. This statement explains why the lithospheric plates move in the same direction as the asthenosphere.</p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
4	A	RST.9-10.7, RST.9-10.1	<p>A. This is the correct response. Option A points to where one plate is forced beneath an adjacent plate, identifying a subduction zone.</p> <p>B. Option B points to where the lithospheric plate is being dragged along by the motion of the asthenosphere.</p> <p>C. Option C points to where a thermal plume rises at a mid-ocean ridge rather than the descending plume identifying a subduction zone.</p> <p>E. Option D points to an area where the asthenosphere is being heated by the planet's core.</p>
5 Part A	A	RST.9-10.6, RST.9-10.1	<p>A. This is the correct response. The author explains the convection process by describing a lava lamp and the viscosity of the Earth's mantle by comparing it to Silly Putty.</p> <p>B. The author does not include any personal anecdotes in the article.</p> <p>C. The author presents important ideas throughout the article rather than summarizing them at the end.</p> <p>D. Although the author mentions that it is difficult to prove or disprove theories, she does not compare theories.</p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
5 Part B	See answers in right column.		<p>1. From Paragraph 2: In this excerpt, the author explains the convection process occurring within the Earth’s mantle by describing a similar process within a lava lamp.</p> <p>“The colorful motion in a lava lamp is the product of convection. At the lamp’s base, heat from a light warms colored wax in a surrounding oil mixture. As the wax heats up, it becomes less dense than the nearby oil and rises. Near the top of the lamp, away from the source of the heat, the wax cool, becomes denser, and sinks back to the bottom of the lamp.”</p> <p>2. From Paragraph 3: In this excerpt, the author illustrates the Earth’s mantle’s changing state by comparing it to the way the texture of Silly Putty changes over time.</p> <p>“To envision how the Earth’s rocky mantle could flow almost like a fluid, think of the child’s toy Silly Putty. When molded tightly into a ball, a large mass of the squishy stuff will bounce like a solid off a hard surface. But if placed in one spot for an hour or more, the Silly Putty, like a very thick fluid, will gradually spread out over the surface. It acts like a solid on a short time scale, and a fluid over longer periods. Mantle convection may be similar, flowing very slowly over a very long period.”</p>
6	See answers in right column.	RI.9-10.2, RI.9-10.3, RI.9-10.1	<p>Reason for Challenge A: According to paragraph 1, “Much of the difficulty arises from the fact that we have no method to view directly the planet’s interior or test relevant theories.”</p> <p>Reason for Challenge B: According to paragraph 5, the fact that the ocean crust is continually recycled “makes it difficult to reconstruct what the planet’s surface looked like earlier than about 200 million years ago.”</p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
7	A, C	RST.9-10.2, RST.9-10.1	<p>A. This is a correct response. Plate movement is believed to be caused largely by convection occurring within the Earth’s mantle.</p> <p>B. The sea floor is spreading, resulting in widening the Atlantic and Indian Oceans and diminishing the Pacific Ocean.</p> <p>C. This is a correct response. Scientists have revisited Wegener’s theory about a combined land mass formed by all the continents.</p> <p>D. The author states that movement of tectonic plates will continue to reshape the Earth’s surface into the future, but she does not imply the speed of this process will increase.</p> <p>E. Although the article states that a supercontinent was formed twice in the past, it does not suggest another supercontinent is likely in the future.</p> <p>F. The process of convection is described as “a spatially complex and dynamic system” rather than “simple.”</p>
8	A, E	RI.9-10.5, RI.9-10.1	<p>A. This is a correct answer. The sentence serves as an introduction to the author’s explanation of the current theory of continental drift.</p> <p>B. Although the sentence includes technical words, it does not define them.</p> <p>C. The sentence does not serve as a pivot point in the passage, as it does not introduce the effects of continental drift.</p> <p>D. This sentence does not serve as a thesis statement, as it does not include the central ideas of the text but instead serves as a detail to support the central idea that the process of continental drift is complex.</p> <p>E. This is a correct answer. The sentence lets readers know that although a simple model can be built to illustrate the process of continental drift, the process is very complex.</p> <p>F. The author states that our understanding is still basic, not that it is well developed.</p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
9	See right column for ideas that may be included in top-score responses	W.9-10.2, W.9-10.4, W.9-10.9, RI.9-10.5, RI.9-10.2, RI.9-10.7, RI.9-10.1, L.9-10.1, L.9-10.2, L.9-10.3	<ul style="list-style-type: none"> • The central idea of this section of the passage is that, just as the surfaces of the Earth have continued to move and readjust over the past hundreds of million years, they will continue to do so in the future. Although “some 600 million years ago, the continents were joined as one large land mass,” plate tectonics affected the position of these land masses and will certainly cause further changes. The author notes that the movement of tectonic plates “will continue to shape and change the planet’s surface, and the jostling and grinding of their edges will inevitably produce powerful volcanic eruptions, cause strong earthquakes, and trigger towering tsunamis.” • Figure 1.10 serves to demonstrate dramatically for the reader the many changes in the Earth’s surface. With such evidence of how, every 25-75 million years, the surface of the planet is completely reshaped, it is nearly impossible for the reader to deny the author’s message that further changes are inevitable.

Additional Resources for Assessment and CCSS Implementation

Shift 1 – Complexity: *Regular practice with complex text and its academic language*

- See Appendix B for examples of informational and literary complex texts
http://www.corestandards.org/assets/Appendix_B.pdf
- See the Text Complexity Collection on www.achievethecore.org

Shift 2 – Evidence: *Reading, writing, and speaking grounded in evidence from text, both literary and informational*

- See Close Reading Exemplars for ways to engage students in close reading on
<http://www.achievethecore.org/steal-these-tools/close-reading-exemplars>
- See the Basal Alignment Project for examples of text-dependent questions
<http://www.achievethecore.org/basal-alignment-project>

Shift 3 – Knowledge: *Building knowledge through content-rich nonfiction*

- See Appendix B for examples of informational and literary complex texts
http://www.corestandards.org/assets/Appendix_B.pdf

Sample Scoring Rubric for Text-Based Writing Prompts:

http://achievethecore.org/content/upload/Scoring_Rubric_for_Text-Based_Writing_Prompts.pdf