



# Close reading plan

“Earth's Composition” by Discovery Education Science

Created by Elizabeth Porter, 2014 Connecticut Dream Team teacher

What makes this text complex?			
<b>Text and Author</b>	Earth's Composition, Discovery Education Science	<b>Where to Access Text</b>	Access on Discovery Education website
Text Description			
This text is a thorough article about Earth's composition which compiles an abundance of information. It provides a brief overview of the study of geology followed by detailed, specific sections about each of the layers of the Earth. The article talks about the characteristics of each layer including their location, thickness, temperature, state of matter and relation to earthquakes. It mentions tectonic plates and explains the process of convection currents. It would be useful as an introduction to the layers of the Earth. It concludes with an explanation of how scientists must often examine data instead of directly examining the object of study in order to understand it.			
Quantitative			
<b>Lexile and Grade Level</b>	Approximate Lexile level:1100, 8 <sup>th</sup> grade	<b>Text Length</b>	938
Qualitative			
Meaning/Central Ideas		Text Structure/Organization	
The central idea of the text is that the Earth is composed of four main layers each with specific characteristics. This information is presented explicitly in paragraphs about each layer. Each section also includes information about the layer beyond its general characteristics (i.e. plate tectonics, convection currents, earthquakes) Another important idea presented in the text is that scientists must often make inferences in order to understand the world.		Text features: headings for each layer of the Earth. Graphics include diagrams of the layers of the Earth, tectonic plates, and convection currents. Headings for each layer of the Earth help clarify the distinctions between them.	
Prior Knowledge Demands		Language Features	
This article requires some understanding of discipline-specific vocabulary. Some of the key terms (crust, mantle, etc.) could be pre-taught to enable lower-level readers to access the text, but this is not necessary for all readers, particularly if follow-up lessons will also address the concepts. Students should know the states of matter. No references to other texts required.		Dense content. Many discipline-specific terms. Sentences of medium length.	
Vocabulary			
Tier Two Words (General academic vocabulary)		Tier Three Words (Domain-specific words)	
<i>"Words that are far more likely to appear in written texts than in speech. [They] often represent subtle or precise ways to say relatively simple things—saunter instead of walk, for example." (CCSS ELA Appendix A)</i>		<i>"[Tier Three words]...are specific to a domain or field of study (lava, carburetor, legislature, circumference, aorta) and key to understanding a new concept within a text." (CCSS ELA Appendix A)</i>	
<ul style="list-style-type: none"> <li>• Composed/composition</li> <li>• Consists</li> <li>• Directly</li> <li>• Formation</li> <li>• Outermost</li> <li>• Interior</li> <li>• Structure</li> </ul>	<ul style="list-style-type: none"> <li>• Pressure</li> <li>• Deform</li> <li>• Compression</li> <li>• Shear</li> <li>• Surface</li> <li>• Secondary</li> </ul>	<ul style="list-style-type: none"> <li>• Geologists</li> <li>• Crust</li> <li>• Mantle</li> <li>• Outer core</li> <li>• Inner core</li> <li>• Plate</li> <li>• Convection</li> </ul>	<ul style="list-style-type: none"> <li>• Density</li> <li>• Lava</li> <li>• Magma</li> <li>• Kilometer</li> <li>• Solid</li> <li>• Liquid</li> <li>• Current</li> </ul>
Potential Reader/Task Challenges			
This article is so content-rich that it may be difficult for students to tease out all of the information about the layers of the Earth after two readings; three readings of certain sections will be necessary. This article has many academic and domain-specific terms that may be challenging for some readers. The article has good diagrams to support comprehension of the main ideas.			

Text-dependent questions		
Question	Standard alignment	Page of this document
<b>What are the identifying characteristics of the 4 main layers of the Earth? Describe in order from innermost to outermost.</b>	RI.7.1 RST.6-8.1	5
<b>How are the mantle and crust similar and different? Include information about their location, thickness, temperature and state of matter.</b>	RI.7.4 RST.6-8.4	8
<b>Authors include certain text structures and techniques to make the article easier for readers to navigate. What structures did this author include and how did these structures guide your understanding of the main idea of the article?</b>	RI.7.5 RST.6-8.5	13
<b>In the article “Earth’s Composition” how does integrating diagrams further develop the understanding of the content? Compare the strengths and weaknesses of both text and diagrams using specific evidence from the text.</b>	RI.7.7* RST.6-8.7 *within one article	16
<b>What is this article mostly about? Identify the central ideas of the text and summarize the key details the author uses to support them.</b>	RI.7.2 RST.6-8.2	21
Target Standards		
<ul style="list-style-type: none"> <li>• RI.7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text <ul style="list-style-type: none"> <li>○ RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.</li> </ul> </li> <li>• RI.7.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone. <ul style="list-style-type: none"> <li>○ RST.6-8.4 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 6-8 texts and topics.</li> </ul> </li> <li>• RI.7.5 Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas. <ul style="list-style-type: none"> <li>○ RST.6-8.5 Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.</li> </ul> </li> <li>• RI.7.7 Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).</li> </ul>		

- RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- RI.7.2 Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.
  - RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

**Question 1**

<b>Question #1</b>	<b>What are the identifying characteristics of the 4 main layers of the Earth? Describe in order from innermost to outermost.</b>	
<b>Standard(s) covered:</b>	<b>RI.7.1</b> Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text <ul style="list-style-type: none"> <li>○ <b>RST.6-8.1</b> Cite specific textual evidence to support analysis of science and technical texts.</li> </ul>	
	<b>Example response that meets standard</b>	<b>Look-fors</b>
	<p>The layers of the Earth are the inner core, outer core, mantle and crust, going from innermost to outermost. The inner core is a solid ball of metal at the center of the Earth and it is the hottest. The outer core is also made also made of hot metals but it is liquid. The mantle is the thickest layer of the Earth and it is cooler and more solid near its top while hotter and more like a liquid toward the outer core. The crust is the outermost layer of the Earth and it is rocky and thin.</p>	<ul style="list-style-type: none"> <li>• Accurately lists layers from inner core to crust</li> <li>• Accurately describes each layer with information about temperature and composition</li> </ul>
<b>If students are struggling to answer the text-dependent question, use this follow-up plan for modeling and practice:</b>		
<b>Objective</b>	In this lesson you will learn how to find the answer to a question in a nonfiction text by locating and explaining specific evidence.	
<b>Prior knowledge to review</b>	Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. (RI.6.1)  Textual evidence should come directly from the text and be distinct from any background knowledge.  Characteristics are describing facts usually found in adjectives.	
<b>Steps to achieve objective</b>	<b>Think aloud for direct instruction</b>	
1) Ask yourself: "What key words in the question should I look for in the text?"	<ul style="list-style-type: none"> <li>• Hmm...I wonder which words in this question are most important for me to remember as I'm looking for evidence in the article?</li> <li>• The question specifically says we should look for information about the composition of each layer. As we go searching for evidence, we want to look for information about composition and characteristics, but first we need to know what those terms mean. If I didn't know what this word meant, I'd use a dictionary to find the meaning.</li> <li>• Composition means what something is made up of. Characteristics are defining features.</li> <li>• I'm going to concentrate on the temperature, position, state of matter and the materials that make up the layers.</li> <li>• The question also asks me to list the terms in order from innermost to outermost.</li> </ul>	

<p>2) Use subheadings to locate relevant sections.</p>	<ul style="list-style-type: none"> <li>• In this article the subheadings break the information into pieces by the name of the layer. The four layers are the crust, mantle, outer core and inner core.</li> <li>• Here I see where the section about the crust begins. I was able to find it easily because headings in this article are in bold. Headings are often printed darker to help readers find them easily.</li> <li>• I'm going to reread this section and annotate the text as I go. Annotating is a process of active reading when the reader marks and takes notes on the text to make the most of the reading process. It often includes highlighting, underlining, circling, arrows and notes in the margins.</li> <li>• REPEAT THE PROCESS OF ANNOTATING FOR ALL LAYERS OF THE EARTH.</li> </ul>
<p>3) Ask yourself: "What evidence in this section helps answer the question?"</p>	<ul style="list-style-type: none"> <li>• Before I go any further, I'm going to create a way to organize the information I have found. I'll create one sticky note for each of the four layers I found in the subheadings.</li> <li>• I need to reread the question to remember what information I have to find in this section. It says, "In the article, what are the identifying characteristics of each layer of the Earth?"</li> <li>• As I was annotating I underlined information on the temperature, position, state of matter and the materials that make up the crust, so I'll add that information to my sticky note labeled "crust".</li> <li>• In the first paragraph of the section on the crust, the article says the "crust is the outermost, rocky layer of Earth". Rocky is the composition and outermost is a defining characteristic. I'm going to add that to my sticky note.</li> <li>• Later in the article, it says that the crust is 5-10km thick under the oceans and 15 to 80km thick under the continents. I'm going to add that too.</li> <li>• I have found the location, temperature and size of the crust, so I have met all of the requirements of the question.</li> <li>• REPEAT THE PROCESS OF ADDING INFORMATION TO THE STICKY NOTE FOR EACH LAYER.</li> </ul>
<p>4) Write about your thinking.</p>	<ul style="list-style-type: none"> <li>• Now that I've found relevant information about the crust and written it on my sticky note, I need to write that as a sentence. I don't need to include everything the article says about the crust, just the information that answers the question.</li> <li>• I think I'll say "the inner core is a solid ball of metal at the center of the Earth and it is the hottest". I check back to make sure that this answers all parts of the question and it does.</li> <li>• REPEAT THESE STEPS FOR THE REMAINING LAYERS OF THE EARTH.</li> <li>• I'm going to add an introductory statement before these sentences to make my writing more clear.</li> </ul>

### Extension and practice

- For additional practice, and if students are having difficulty identifying the characteristics of the layers of the Earth, have them make a foldable. The foldable should guide students to color code the layers to help them remember the relative location of each layer. The foldable will also have students integrate information about the composition inside the flaps of the foldable. The structure of this foldable should help students identify the characteristics of each layer in a way that they can easily compare and contrast the layers; the characteristics should be listed similarly for each layer (i.e. temperature, thickness, state of matter).
  - This foldable should be made with two 8.5"x11" papers. Put one on top of the other, with the one on top about 2.5" down from the top of the other. Then fold up the bottoms of the papers to make 4 approximately equal sections. Staple this and then trim the paper into a triangle shape, like a pizza. In this shape, students can see it as a "slice" of the Earth.
- For additional practice for students who are struggling to complete this task, a strategy that could be used is to create a graphic organizer. The top row could list the layers (crust, mantle, outer core, inner core) and the left-most column could identify characteristics the teacher wants students to find within the text (temperature, position, state of matter, etc.)

### What next?

For additional practice, with students or for students' independent work, apply this learning objective and set of steps to answer a question in a nonfiction text by citing specific evidence. RI.7.1, RST.6-8.1

Objective: In this lesson you will learn how to find the answer to a question in a nonfiction text by locating and explaining specific evidence.

1. Ask yourself: "What key words in the question should I look for in the text?"
2. Use subheadings to locate relevant sections.
3. Ask yourself: "What evidence in this section helps answer the question?"
4. Write about your thinking.

**Question 2**

<b>Question #2</b>	<b>How are the mantle and crust similar and different? Include information about their location, thickness, temperature and state of matter.</b>
<b>Standard(s) covered:</b>	<b>RI.7.4</b> Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone <ul style="list-style-type: none"> <li>○ <b>RST.6-8.4</b> 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 6-8 texts and topics.</li> </ul>

<b>Example response that meets standard</b>	<b>Look-fors</b>
<p>The Earth is broken into four main layers, each with different characteristics. The mantle and crust are the two uppermost layers of the Earth. The crust is thinner, 5-80km thick, while the mantle is 2,900km thick. The crust is cooler than the mantle. The crust is solid. The mantle is also solid at the top, but moves like a liquid at the bottom, where it is hotter.</p>	<ul style="list-style-type: none"> <li>• Accurately describes each layer including thickness, temperature and state of matter.</li> <li>• Compares the layers with terms like hotter/cooler, thicker/thinner, above/below</li> </ul>

**If students are struggling to answer the text-dependent question, use this follow-up plan for modeling and practice:**

<b>Objective</b>	In this lesson you will learn how to determine a relationship between two scientific objects by comparing and contrasting their properties as described in specific details in the text.
<b>Prior knowledge to review</b>	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings. (RI.6.4) In order to compare and contrast the reader must find similarities (features that are the same) and differences (features that are distinct).
<b>Steps to achieve objective</b>	<b>Think aloud for direct instruction</b>
1) Locate the section of text that refers to what the question asks.	<ul style="list-style-type: none"> <li>• I'm going to go back and look at the question to see what I'm supposed to do with the information. The question directs me to compare and contrast the crust and mantle.</li> <li>• This will take me two separate steps. First, I need to gather information about the layers. Then, I can compare and contrast those layers using key terms like hotter/cooler, thicker/thinner, above/below.</li> <li>• The question says to include information about the crust and the mantle's thickness, temperature and state of matter. I'm going to look for information about those characteristics.</li> <li>• I'll go to the section with the subheading labeled crust and start highlighting.</li> <li>• REPEAT HIGHLIGHTING INFORMATION FOR THE MANTLE.</li> </ul>

<p>2) Organize details in a graphic organizer.</p>	<ul style="list-style-type: none"> <li>• I need a clearer way to organize my thoughts, so I'll make a graphic organizer for the sections I've highlighted. That way I can take notes about each layer and easily compare.</li> <li>• Organizers that help with comparing and contrasting are a Venn diagram or a three-column chart. They both have similarities written in the center section.</li> <li>• For the crust I have included that it's the uppermost, 5-80 km thick, solid and less dense. The text doesn't provide a temperature but it says "cooler" so I'll write that in the temperature section.</li> <li>• REPEAT WITH INFORMATION ABOUT THE MANTLE.</li> </ul>
<p>3) Compare and contrast details about the objects.</p>	<ul style="list-style-type: none"> <li>• At this point I have details about both of the layers of the Earth. Now I need to evaluate the similarities and differences between the two layers. In the first row of my graphic organizer, I have noted that the crust is the uppermost layer of the Earth and the mantle is below it. A similarity between these two facts is that both of these layers are the outer layers of the Earth, on top of the core.</li> <li>• I've also made notes about the thickness of each layer. As I compare their thickness, I notice that the crust is much thinner. I'll need to include that in my explanation.</li> <li>• I need to include information about temperature next. The article does not provide the exact temperature of the crust but says that the crust is cooler than the mantle.</li> <li>• Checking back to the question, the part that I haven't included yet is state of matter. My graphic organizer says that the crust is solid and the mantle is only solid at the top, this is a key difference that I should mention.</li> </ul>

### Extension and practice

- As an extension, a teacher could demonstrate how solids change to liquids at higher temperatures to help students understand the content in a more concrete, visual way. This could be done simply with an ice cube. Showing water as a solid, liquid and gas and identifying the temperatures that those states of matter relate to may help students remember that solids turn to liquids when heated. The connection needs to be made back to the text and the description of the bottom of the mantle, where it's hotter, being molten, or in liquid form.
- As an extension a teacher may want to explain how pressure causes an increase in temperature. This is implied by the article but not clearly explained. It is difficult for students to understand how the pressure generated by the weight of the layers above causes lower layers of the Earth to be hotter. This principle could be discussed and possibly demonstrated. A lab activity for this could involve shaking bottles of carbonated beverages and testing the temperature; the increase in pressure raises the temperature inside the bottle.
- Another way to teach students to find the information in the text would be to color-code while highlighting. The teacher could designate certain colors for each layer (such as yellow and blue) and then another color (such as green) for the similarities. This could be an intermediate step between locating the information in the text and adding it to the graphic organizer.

### What next?

For additional practice, with students or for students' independent work, apply this learning objective and set of steps to compare and contrast properties of objects in nonfiction text. RI.7.4, RST.6-8.4

See more examples of how to teach comparing and contrasting details in nonfiction text. RI.7.4, RST.6-8.4

Objective: In this lesson you will learn how to determine a relationship between two scientific objects by comparing and contrasting their properties as described in specific details in the text.

1. Locate the section of text that refers to what the question asks.
2. Organize the details in a graphic organizer.
3. Compare and contrast details about the objects.

1. [Find the meaning of technical words](#) RI.8.4
2. [Determine the meaning of words by comparing denotative and connotative meanings](#) RI.6.4
3. [Compare and contrast textual details by color-coding and highlighting](#) RI.7.1

	<b>CRUST</b>	<b>BOTH</b>	<b>MANTLE</b>
<b>Location</b>			
<b>Thickness</b>			
<b>Temperature</b>			
<b>State of matter</b>			
<b>Other information</b>			

<b>KEY</b>	<b>CRUST</b>	<b>BOTH</b>	<b>MANTLE</b>
<b>Location</b>	Uppermost layer	2 uppermost layers Hotter as you go down At least partially solid	In between crust and core
<b>Thickness</b>	5-80km thick		2,900km thick
<b>Temperature</b>	Cooler		Hotter
<b>State of matter</b>	Solid		Solid at top, liquid at bottom
<b>Other information</b>	Less dense, broken into plates, some of it can be studied directly		Divided into layers with different characteristics, can't be studied directly



<p>1) Look for visible text structures in the article.</p>	<ul style="list-style-type: none"> <li>• Great readers look for certain text structures and writing techniques used by the author to help them locate key information such as: headings, bolded terms, diagrams and captions.</li> <li>• Looking back at the article, I quickly see that there are headings and diagrams. As I continue to scan the article, I notice that some of these diagrams have captions.</li> <li>• When I look at what I highlighted during my first read-through, I notice that for every layer of the Earth I have the same type of information. The author included information about the thickness, state of matter and temperature of each layer. This internal paragraph structure is another feature that helped me understand the material and relate from one topic to another. I've seen this organization of information in other scientific texts.</li> </ul>
<p>2) List the text structures you have found with examples.</p>	<ul style="list-style-type: none"> <li>• I'm going to list each of the four text structures I found on its own sticky note so that I can organize my thoughts.</li> <li>• The text structures I found are headings, diagrams, captions and an internal paragraph structure.</li> <li>• Next, I'm going to go back to the text to list examples of how each text structure helped me understand this article.</li> <li>• The headings helped me find information quickly within the text.</li> <li>• REPEAT THIS PROCESS FOR ALL TEXT STRUCTURES.</li> </ul>
<p>3) Explain how the text structures guided your understanding.</p>	<ul style="list-style-type: none"> <li>• Okay, now that I know the four features the author included in this article and how each one helped me, I'm going to organize my thoughts into a paragraph.</li> <li>• I think it makes sense to list the text features in the order in which I noticed them, so I'm going to go back to the text and check so that I can arrange my sticky notes in the same order before I start writing. I first noticed headings, then diagrams and their captions and it wasn't until the last section that I noticed the internal paragraph structure.</li> <li>• Now that my notes are organized I'm going to write an introductory statement that addresses the question. I'll say something like: "This article includes four text structures that made it easier for me to understand this article: headings, diagrams, captions, and paragraphs that list the same information for each of the four layers of the Earth".</li> <li>• I'll use my sticky notes to guide my thinking as I write an explanation. I wrote on the sticky note that headings helped me find information quickly within the text. I should include an example of when this was helpful as a reader because the question asks how the text structures "guide my understanding". I think I'll write: "The headings allow me to locate the information quickly, such as the crust versus the mantle".</li> <li>• REPEAT WITH OTHER TEXT STRUCTURES.</li> </ul>

### Extension and practice

- For additional practice if students are unaware of various text structures, present a unit on text structures with examples. Children’s books are often good for teaching the types of text structure, because they are easily accessed by students. You can also teach different genres of writing and how their text structures vary. Genre study should be taught in multiple grade levels and is relevant to different units throughout the year, such as units on poetry, nonfiction text, novels, etc. For this lesson, it would be meaningful to select a text that has similar text features to those found in this article: headings, diagrams, captions and/or internal paragraph structures. A children’s book about a science topic would be most likely to have the same types of features as this article.
- For additional practice for students who already have exposure to text structures you could have them work in groups to brainstorm different structures they have seen in other articles and books. They could do this after they have read the question but before they reread the article. Students could list these text structures on chart paper and volunteers could come up to the paper to explain how they think that text feature helps readers. Then, students could return to the text individually and search for the text feature. The teacher could stop and check that students have accurately identified these features. Students could use the chart paper as a reference to see if their general ideas help them locate specific ways that the text structures helped them understand the content of this article.

### What next?

For additional practice, with students or for students' independent work, apply this learning objective and set of steps to navigate informational articles by identifying text structures. RI.7.5, RST.6-8.5

See more examples of how to teach navigating informational articles by using text structures. RI.7.5, RST.6-8.5

Objective: In this lesson you will learn how to navigate nonfiction articles more effectively by identifying text structures.

1. Look for visible text structures in the article.
2. List the text structures you have found with examples.
3. Explain how the text structures guided your understanding.

1. [Preview a nonfiction text by looking at headings and titles](#) RI.5.10
2. [Preview a nonfiction article by looking at the title and subtitles](#) RI.8.10

**Question 4**

<b>Question #4</b>	<b>In the article “Earth’s Composition” how does integrating diagrams further develop the understanding of the content? Compare the strengths and weaknesses of both text and diagrams using specific evidence from the text.</b>
<b>Standard(s) covered:</b>	<p><b>*RI.7.7</b> Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words). *In this question we are not using multiple sources, as the standard recommends, but rather building the skill by using different media within one text.</p> <ul style="list-style-type: none"> <li>○ <b>RST.6-8.7</b> Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).</li> </ul>

<b>Example response that meets standard</b>	<b>Look-fors</b>
<p>The text provided abundant factual information about the layers, such as that the crust is 5-80km thick, while the mantle is 2,900km thick. The diagram allows the reader to see the spatial relationships between the layers; it is clear in the diagram that the crust is on top of the mantle and that the crust is much thinner. A strength of text is that it can be more specific. However, it is sometimes hard to create a mental picture from text.</p> <p>A strength of diagrams is how they present information in a way that is easier to understand and remember. A weakness of diagrams is their lack of factual information. For example, in this article, the diagram of the layers of the Earth showed their relative size, but did not list their actual thickness, as it did in the text.</p> <p>Different media have different strengths and weaknesses. When information is presented in multiple ways, readers understand the material more thoroughly. The text of this article provided the reader with details and the diagrams provided them with a mental picture.</p>	<ul style="list-style-type: none"> <li>• Accurately explains strengths and weaknesses of both text and diagrams.</li> <li>• Uses at least one specific example from this text to support ideas for each strength.               <ul style="list-style-type: none"> <li>○ Answers will vary based on the diagram selected by the student.</li> <li>○ See attached graphic organizer for more specific sample answers</li> </ul> </li> </ul>

**If students are struggling to answer the text-dependent question, use this follow-up plan for modeling and practice:**

<b>Objective</b>	In this lesson you will learn how to compare and contrast different mediums by determining their strengths and weaknesses in presenting information.
<b>Prior knowledge to review</b>	<p>Integrate information in different media or formats as well as in words to develop a coherent understanding of a topic. RI.6.7</p> <p>A diagram is a labeled picture.</p>
<b>Steps to achieve objective</b>	<b>Think aloud for direct instruction</b>

<p>1) Ask yourself: "What diagrams do I notice in this article?"</p>	<ul style="list-style-type: none"> <li>• As I look at this article, I notice that there are three diagrams included. The first is a diagram of the layers of the Earth, the second shows the plates and the third shows convection currents in the mantle.</li> <li>• I notice that each of these diagrams also has a caption underneath and some labels within the diagram itself.</li> </ul>
<p>2) Record what information each type of media provides in a graphic organizer.</p>	<ul style="list-style-type: none"> <li>• I'm going to focus my comparison on the diagram on the layers of the Earth. I've decided to do this because I know that the title of the article is "Earth's Composition" so I think this diagram is the most important to understanding the material.</li> <li>• To organize my thoughts about the strengths and weaknesses of text versus diagrams, I'm going to make a graphic organizer. I'll include a section for specific examples of each.</li> <li>• When I think about what I've learned from this article I have a mental picture in my head about the layers of the Earth. The diagram helped me form that mental picture so I'm going to add that to my strength example section.</li> <li>• I've learned a lot of details from this article, and they didn't come from the diagram. I learned that the crust is 5-80km thick and that the mantle is solid at the top and liquid at the bottom.</li> <li>• Almost all of the details I've learned have come from the text. I'm going to add some of those details to the strength example section for the text.</li> <li>• CONTINUE TO MODEL LOOKING AT SPECIFIC DETAILS WITHIN THE TEXT.</li> </ul>
<p>3) Write about the weaknesses of different types of media with details.</p>	<ul style="list-style-type: none"> <li>• Now that I have strengths for both the diagram and the text I'm realizing that their weaknesses are what they don't offer; the text isn't as good at painting a mental picture and the diagram wasn't as good at providing details. I think those are general strengths and weaknesses that I can add to my graphic organizer.</li> <li>• I expect that the text and diagrams of other articles will have similar strengths and weaknesses, so next time I'm reading I'll know what to look for, for each type of information.</li> <li>• WRITE MODEL ANSWER, USING DETAILS FROM THE GRAPHIC ORGANIZER.</li> </ul>

	<b>TEXT</b>	<b>DIAGRAM</b>
<b>Strength</b>		
<b>Strength example</b>		
<b>Weakness</b>		
<b>Weakness example</b>		

<b>SAMPLE</b>	<b>TEXT</b>	<b>DIAGRAM</b>
<b>Strength</b>	Abundant information, detailed and specific information	Easy to form mental picture and see spatial relationships, identifies important information
<b>Strength example</b>	The crust is 5-80km thick and the mantle is 2,900km thick.	The diagram allows the reader to see the spatial relationships between the layers; it is clear in the diagram that the crust is on top of the mantle and that the crust is much thinner.
<b>Weakness</b>	Weakness of text: hard to create mental picture, hard to tease out most important information	Less factual information
<b>Weakness example</b>	The text says the thickness of the articles but the relative size is hard to visualize	The diagram of the layers of the Earth shows their relative size, but does not list their actual thickness, as it does in the text.

### Extension and practice

- For additional practice a way to make the connection between what is learned and the media would be for students to complete a KWL chart. A KWL chart is a three-column graphic organizer and stands for “know”, “want to know” and “learned”. They would complete the “K” and “W” sections before reading and the “L” section during or after reading. Following this, they can return to the text and identify where they learned each fact that they placed in the “L” section. This will help some students tease apart that they have mentally compiled information from both sources.
- As an extension you could have students draw a picture of a part of the text that does not have a diagram and compare their level of understanding from before drawing the diagram to their understanding after. A good section for this would be the paragraph on earthquake waves and their properties. Drawing out a quick diagram showing the direction that these waves travel and their speeds will help students understand the properties of these waves. Then, the connection can be made between how this diagram helped students understand the text, to how other diagrams helped the students comprehend the rest of the article. This lesson, on [Creating a mental model by drawing a diagram](#) (RI.8.1) shows an example of how to do this.
- As an extension, you could have students analyze other diagrams from the text. Students could apply the “steps to achieve objective” to explain how other diagrams contributed to their understanding of the material.

### What next?

For additional practice, with students or for students' independent work, apply this learning objective and set of steps to compare and contrast different mediums by determining their strengths and weaknesses in presenting information. RI.7.7, RST.6-8.7

Objective: In this lesson you will learn how to compare and contrast different mediums by determining their strengths and weaknesses in presenting information.

1. Ask yourself: “What diagrams do I notice in this article?”
2. Record what information each type of media provides in a graphic organizer.
3. Write about the weaknesses of different types of media with details.

**Question 5**

<b>Question #5</b>	<b>What is this article mostly about? Identify the central ideas of the text and summarize the key details the author uses to support them.</b>
<b>Standard(s) covered:</b>	<b>RI.7.2</b> Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text. <ul style="list-style-type: none"> <li>○ <b>RST.6-8.2</b> Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.</li> </ul>

<b>Example response that meets standard</b>	<b>Look-fors</b>
<p>One central idea of this text is that the layers of the Earth have different characteristics. The layers are the inner core, outer core, mantle and crust, going from innermost to outermost. The inner core is a solid ball of metal at the center of the Earth and it is the hottest. The outer core is also made of hot metals but it is liquid. The mantle is the thickest layer of the Earth and it is cooler and more solid near its top while hotter and more like a liquid toward the outer core. The crust is the outermost layer of the Earth and it is rocky and thin.</p> <p>Another central idea from the text is that scientists must use inferences to understand the world, because not everything can be directly observed. The crust can be observed directly because it is the outermost layer, but the other layers of the Earth cannot be seen. One example from the article of scientists making inferences is when they study lava to determine characteristics of the mantle. Lava is magma that has reached the surface and it retains some properties of the layer from which it came, the mantle. The article also explains that scientists used earthquake data to figure out that the outer core is liquid. They knew that secondary waves cannot travel through liquids, and therefore figured out that the outer core must be liquid when these waves were not detected on the other side of the world.</p>	<ul style="list-style-type: none"> <li>• Accurately identifies the central idea that all four layers of the Earth have different characteristics</li> <li>• Provides an overview of the layers' characteristics with specific details from the text</li> <li>• Identifies the recurring theme that scientists use inferences to understand the world</li> <li>• Provides examples from the text of scientists using inferences</li> <li>• Other possible central ideas include: layers of the Earth get hotter with increasing depth, layers get denser with increasing depth, and composition affects properties of matter</li> </ul>

**If students are struggling to answer the text-dependent question, use this follow-up plan for modeling and practice:**

<b>Objective</b>	In this lesson you will learn how to determine the central ideas of an article by piecing together key details into a summary.
<b>Prior knowledge to review</b>	Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. RI.6.2  A central idea is what a text is mostly about; it should be supported by key details from the text.
<b>Steps to achieve objective</b>	<b>Think aloud for direct instruction</b>

<p>1) Highlight words and phrases that answer who, what, why, when and where.</p>	<ul style="list-style-type: none"> <li>• This question is asking me to locate the central idea and summarize the text with key details.</li> <li>• When I start looking for a central idea I look at the title and the beginning of the article. I know that titles often summarize the main idea of informational articles and the beginning of an article often introduces the main topic.</li> <li>• The title of this article is “Earth’s Composition” so I have a pretty strong feeling that the composition of the Earth is going to be one central idea. I’m going to highlight the title to remind myself of this.</li> <li>• In this first paragraph, which I suspect is the introduction, I’m going to highlight information that clues me in to the 5 Ws. Specifically for this article, I’m looking for information about who is doing this research, why I should care, what this article is primarily about, when this information was discovered and where these different layers of the Earth are located.</li> <li>• I’m going to focus the search for information in the introduction by considering the title of the article. Since the article is called “Earth’s composition” I’m going to look for information about Earth’s composition, or what the Earth is made of. I might also highlight words and phrases that tell us how this information was discovered.</li> <li>• The first paragraph of this article talks about geologists. Geologists are the “who” of this article; they’re the scientists that study the Earth. I’m going to highlight the sentence that describes their job. In the next couple of sentences, it talks about <i>how</i> geologists find information; I’m going to highlight that as well because how this information is known is important.</li> <li>• As we look for the 5 Ws and information about Earth’s composition, we’re going to highlight what we think is relevant.</li> <li>• CONTINUE TO MODEL LOCATING THE 5WS AND CENTRAL IDEAS.</li> </ul>
<p>2) Ask yourself: “How do these ideas fit together?”</p>	<ul style="list-style-type: none"> <li>• As I’m searching, I keep in mind that not all of the paragraphs will answer all of the 5 Ws, and that is okay. I’m going to look for what each paragraph is telling us, and then compile this information after I’ve finished searching.</li> <li>• In the second paragraph I’m seeing a lot of details about the layers of the Earth. I also see that the names of the layers listed here appear later in the text as headings. This confirms my thought that a central idea of this text is about Earth’s composition.</li> <li>• As I continue reading, I’m going to see if I can identify any other central ideas.</li> <li>• CONTINUE READING AND HIGHLIGHTING INFORMATION THAT ANSWERS THE 5WS.</li> <li>• This article ends with a paragraph that says that “sometimes scientists cannot directly observe the things they study, so they need to examine other data that can help them figure out what they want to know”. I know that authors often recap important points at the end of an article. During my first read-through I didn’t think this was a central idea, but now that I know the author thought it was important enough to conclude with, I’m going to go back to the text to look for evidence that this was a recurring idea.</li> <li>• RETURN TO THE TEXT LOOKING FOR EVIDENCE RELATED TO THIS CENTRAL IDEA.</li> <li>• REPEAT WITH OTHER CENTRAL IDEAS FROM THE TEXT.</li> <li>• Other central ideas may include, but are not limited to: layers of the Earth get hotter with increasing depth, layers get denser with increasing depth, and composition affects properties of matter.</li> </ul>
<p>3) Write down 2-3 central ideas and related details.</p>	<ul style="list-style-type: none"> <li>• I think the central idea of this text is that the layers of Earth have different characteristics and scientists have discovered those characteristics through inferences.</li> <li>• I’m going to write out these two ideas, and then match the phrases I’ve highlighted with these ideas, since they support my answer.</li> <li>• I’ll add notes under these two main ideas based on what I’ve highlighted.</li> </ul>

### Extension and practice

- For additional practice, teachers could direct students to focus on the first paragraph of each section with a heading. This will focus them to see that the paragraphs are about the layers of the Earth and may eliminate potentially distracting information. This is a common feature that science texts use to make the content easier to understand; students should be taught to expect this in later scientific texts.

## What next?

For additional practice, with students or for students' independent work, apply this learning objective and set of steps to determine the central ideas of an article by piecing together key details into a summary. RI.7.2, RST.6-8.2

See more examples of how to teach determining the central ideas of an article by piecing key details into a summary. RI.7.2, RST.6-8.2

Objective: In this lesson you will learn how to determine the central ideas of an article by piecing together key details into a summary.

1. Highlight words and phrases that answer who, what, why, when and where.
2. Ask yourself: "How these ideas fit together?"
3. Write down 2-3 central ideas and related details.

1. [Determining the central idea of a nonfiction article by finding the who, what, where and why](#) RI.7.2
2. [Determine the central idea of a text by analyzing a subject's accomplishments](#) RI.6.2
3. [Determine the central idea of a nonfiction article by determining the topic and asking what the author is saying about it](#) RI.8.2
4. [Summarize chunks of text by pausing](#) RI.8.2
5. [Understand the role of an introduction in an informational article](#) RI.7.1