



Lesson Plan and Activities

Written in accordance with the Language Arts, Social Studies, and Science Standards

El Abecé Visual de la Tierra

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Illustrator: FERNANDO SAN MARTÍN

COMPLEXITY

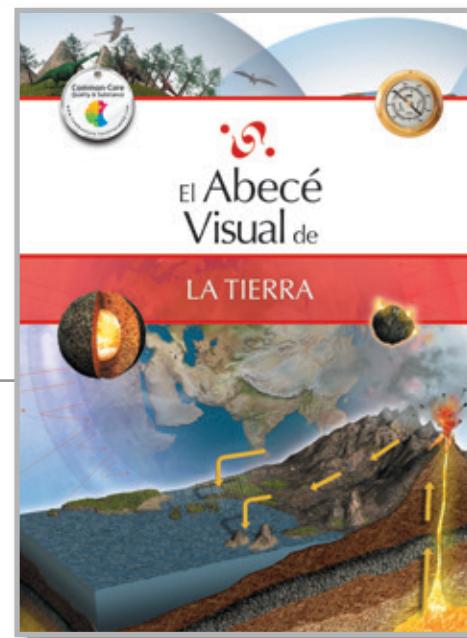
F&P Guided Reading Level Y / Lexile Level 960L

TEXT TYPE

Informational Text: Science

OBJECTIVES

- ➡ Demonstrate comprehension of an Earth science text.
- ➡ Understand the graphic features of a science text.
- ➡ Summarize information.
- ➡ Identify and explore cause and effect relationships.
- ➡ Use word structure, context clues, and word origin to understand multiple-meaning words.



INSTRUCTIONAL FOCUS:

Staircase of Complexity / Reading Rigor

INSTRUCTIONAL FOCUS:

Balancing Informational and Literary Text



Together we foster lifelong readers

MATERIALS

- ▶ *Causa y efecto, Red de palabras*
(Graphic Organizers #4 and #26)*
- ▶ index cards
- ▶ materials for experiments: fish tanks or similar containers, ice cube trays, sticks
- ▶ cardboard, crayons, magnets
- ▶ calculator

SUMMARY

This book presents some of the most important and interesting geological phenomena that have helped shape our planet. Volcanoes, continental drift, and plate tectonics are some of the phenomena that show us how the Earth is constantly changing and evolving. The different types of weather experienced in different regions of the world also contribute to changes on the Earth's surface. Humans are also responsible for some of the changes in our planet, including climate changes and environmental modifications.

STANDARDS

SLAR CCSS RI 5.1, RI 5.2, RI 5.3, RI 5.4, RI 5.5, RI 5.9, RI 5.10, RF 5.3.a, RF 5.4.a, W 5.2, W 5.4, W 5.5, W 5.7, W 5.8, W 5.10, SL 5.1, SL 5.4, SL 5.5, L 5.1, L 5.2, L 5.3, L 5.4.a, L 5.4.b, L 5.4.c, L 5.6

SLAR TEKS 5.1.A, 5.2.A, 5.2.B, 5.2.E, 5.9.A, 5.11.A, 5.11.C, 5.11.D, 5.11.E, 5.15, 5.20.D, 5.21, 5.22.A, 5.22.C.(i), 5.22.C.(iv), 5.23.B, 5.24.A, 5.24.D, 5.26.A, 5.26.B, 5.26.C, 5.27.A, 5.28.A

Science TEKS 5.7.A, 5.9.C

NGSS 5-PS1-3; 5-PS2-1; 5-LS2; 5-ESS2; 5-ESS-3

VOCABULARY

- abertura** – agujero o grieta / opening
- aniquilar** – matar, destruir por completo / to annihilate
- constatar** – comprobar que algo es cierto / to confirm
- degradar** – transformar una sustancia en otra; dañar / to break down; to harm
- deteriorar** – estropear poco a poco, empeorar / to damage
- difuso** – borroso, que no está claro / dim
- disposición** – orden o colocación de algo en un lugar / arrangement
- emergir** – salir a la superficie / to emerge
- intermitente** – que se detiene y luego prosigue / intermittent
- nocivo** – dañino, perjudicial / damaging
- oscilar** – moverse de un lado a otro en vaivén; variar / to swing; to vary
- sustentar** – alimentar, proveer de recursos / to sustain

INSTRUCTIONAL FOCUS: Academic Vocabulary

Advanced Vocabulary

- autóctono** – nativo de un lugar / native
- calcinar** – carbonizar, quemar / to char
- depurar** – limpiar o purificar / to treat
- deriva** – desplazamiento lento sin rumbo fijo / drift
- fricción** – roce de dos cuerpos u objetos / friction
- infiltrar** – introducirse un líquido poco a poco en un sólido / to seep
- meteorito** – roca que está en el espacio y que puede caer a la Tierra / meteorite
- potable** – que se puede beber / drinkable
- refractar** – hacer que cambie de dirección un rayo de luz / to refract
- sismógrafo** – instrumento que indica la dirección y fuerza de un terremoto / seismograph
- viscoso** – líquido espeso y pegajoso / viscose

* To download the Spanish Graphic Organizers in this lesson go to: santillanausa.com/spanishliteracy



VOCABULARY DEVELOPMENT

- ▶ Introduce vocabulary by providing a description, explanation, or example of all the words presented in the vocabulary section and any additional vocabulary you may wish to discuss prior to the reading activities. Consider using pictures, sketches, and/or pantomime to explain the meaning of each word. You may also tell a story to integrate some of the terms.
- ▶ Make sure students understand all the vocabulary needed to complete the activities (e.g., *causa*, *diagrama*, *efecto*, *gráfico*) and instruction words, such as *cita*, *explica*, *infiere*, *justifica*, *predice*, *resume*.
- ▶ Ask students to explain in their own words what each word means. Then, have them create flash cards. Distribute index cards and ask students to write these headings, leaving space for their answers, on each card: *Palabra*, *Mi definición*, *Oración (ejemplo)*. Then have them work in pairs to test each other using these flash cards.
- ▶ Point out the Greek word part *-grafo* (written or writing) in *sismógrafo*. Explain that many scientific words have Greek or Latin origins. Introduce these Greek and Latin word parts: *-cida* (killer), *geo* (Earth), *hidro* (water), *peri* (around), and *termo* (heat). Then have students explain the meaning of these words: *geotérmico* (p. 28), *hidroeléctrico* (p. 18), *mareógrafo* (p. 17), *periglaciar* (p. 53), and *plaguicida* (p. 54).
- ▶ Point to the word *degradar* in the vocabulary list and explain that it has two different meanings in the book: “to break down” (p. 54) and “to harm” (p. 61). The same happens with the word *oscilar* “to swing” (p. 14) and “to vary” (p. 33). Explain that context clues help with understanding multiple-meaning words. Then, distribute four word webs charts (Graphic Organizer #26) to each student and have them write these words in the central ovals: *corteza*, *falla*, *manto*, *placa*. Next, have students add the definitions they know for these words to their webs. Then have them look up these words in a dictionary and add other definitions in the remaining ovals. Finally, have students analyze how these words are used in the text and determine which definition applies in each case: *corteza* (Earth’s crust) on page 8, *falla* (fault) on page 14, *manto* (Earth’s mantle) on page 9 and (blanket) on page 24, *placa* (plate) on page 10. Have students write a sentence with each meaning.
- ▶ Point to the explanation on page 12 about the origin of the word *volcán* (from the Roman god of fire, *Vulcano*). Explain that knowing the origins of words teaches us about the history of the product or phenomenon the word names. Next, have students look for these words in the text and ask them to write in their notebooks the origin, meaning, and any other anecdotal information provided in the text: *escala de Beaufort* (p. 30), *huracán* (p. 32), *magnetismo* (p. 49), *Pangea* (p. 11), and *tsunami* (p. 16). Then ask them to write an original sentence for each word.

► READING

PRE-READING

- ▶ Discuss with students several geological and weather phenomena. Ask: *¿Qué es un volcán? ¿Qué lo provoca?* (What is a volcano? What causes it?) *¿Qué es un huracán? ¿Y un tornado?* (What is a hurricane? And a tornado?) *¿Han experimentado alguno de estos fenómenos u otros como tormentas o terremotos? Comenten qué sucedió.* (Have you experienced some of these phenomena or others, such as storms or earthquakes? Tell what happened.)
- ▶ Have students read the title and table of contents. Allow them a moment to look at the illustrations. Then ask: *¿De qué creen que trata el libro?* (What do you think the book is about?) *¿Qué tipo de texto creen que es? ¿Por qué?* (What type of text do you think this is? Why?)
- ▶ Have students set a purpose for reading. Ask: *¿Qué esperan aprender al leer este libro?* (What do you expect to learn by reading this book?)

READING

- ▶ Discuss with students the text structure of this book. Elicit that it is divided into twenty-eight spreads, and that each spread presents a geological phenomenon or a pollution problem that affects life on Earth. Read aloud the first spread on pages 6–7 to familiarize students with the text and to model pronunciation and intonation. Pause often to allow students time to observe the illustrations. Then, ask: *¿Qué era la Tierra en sus comienzos? ¿Cómo aumentó de tamaño?* (What was the Earth at the beginning? How did it increase in size?) *¿Cómo se formó la atmósfera de la Tierra?* (How did the Earth's atmosphere form?) *¿Dónde surgieron los primeros seres vivos? ¿Cómo eran?* (Where did the first living things emerge? What were they like?)
- ▶ Have students read in pairs. Assign a spread to each pair. Provide index cards and have them make notes for themselves as they read. Students should list important details, the main idea, and any other words or phrases whose meaning they cannot determine. After they finish reading their assigned spread, have students prepare to teach it to another pair. Use a group quiz to encourage them to work collaboratively and to assess comprehension and analysis of the text. Some examples of questions include: *¿De qué trata el texto?* (What is the text about?) *¿Cuáles son los detalles clave? ¿Por qué son importantes?* (What are the key details? Why are those details important?) *¿Cuál es la idea principal? Resúmarla en una oración.* (What is the main idea? Summarize it in a sentence.)
- ▶ Emphasize the importance of interpreting the graphic features in a text. Ask students these or similar questions to assess their comprehension of the charts and graphs presented in the text: *Según el diagrama sobre los estados del agua de la página 19, ¿qué sucede si el agua líquida pierde calor?* (According to the diagram about the states of water on page 19, what happens if the liquid water loses heat?) *Según el gráfico en la página 27, ¿qué porcentaje del agua de la Tierra es agua dulce? ¿Cuál es la principal fuente de agua dulce?* (According to the graph on page 27, what percentage of the Earth's water is fresh water? What is the main source of fresh water?) *Usen el diagrama de las páginas 54 y 55 para explicar los distintos tipos de contaminación que existen y las causas.* (Use the diagram on pages 54 and 55 to explain what different types of pollution exist and the causes.)

INSTRUCTIONAL FOCUS:

Text-based Answers / Critical Analysis





DIFFERENTIATED INSTRUCTION

Below-level Students

- Have students answer these or similar comprehension questions with short phrases or incomplete sentences: *¿Qué tipos de precipitaciones hay? ¿Cómo cambia el tipo de precipitación según la zona?* (What kinds of precipitation are there? How does the type of precipitation change depending on the zone?) *¿Cuántos colores hay en la luz blanca? ¿Cuáles son?* (How many colors are there in white light? Which are the colors?) *Menciona dos climas y algunas de sus características.* (Mention two climates and some of their characteristics.)

At-level Students

- Encourage students to make inferences and predictions based on the text, using short sentences. Ask these or similar questions: *¿Por qué se dice que “la Tierra es un planeta vivo”* (p. 10)? *Cita evidencias del texto.* (Why is the Earth a “living planet”? Cite text evidence.) *Compara y contrasta los huracanes y los tornados.* (Compare and contrast hurricanes and tornadoes.) *¿Qué sucederá si aumenta la lluvia ácida? Menciona dos cosas que podemos hacer para prevenir que eso suceda.* (What will happen if the amount of acid rain increases? Mention two things we can do to prevent that from happening.)

Above-level Students

- Encourage students to analyze and evaluate the text, using complete and elaborate answers. Ask these or similar questions: *¿Por qué es la lluvia tan escasa en los desiertos? Haz un diagrama para explicarlo.* (Why is rain so scarce in deserts? Draw a diagram to explain it.) *¿Se podría formar un huracán en la costa de Argentina? Justifica tu respuesta.* (Could a hurricane form on the coast of Argentina? Justify your answer.) *En tu opinión, ¿cuál es el tipo de contaminación más dañino? ¿Por qué?* (In your opinion, what is the worst type of pollution? Why?)

POST-READING

- Explain that each action (cause) has a consequence (effect). Model an example: *Cuando usamos un vehículo (causa), se incrementa la cantidad de dióxido de carbono en la atmósfera (efecto).* (When we use a vehicle [cause], the amount of carbon dioxide in the atmosphere increases [effect]). Discuss and analyze cause and effect relationships. Ask: *¿Cuál es un efecto de un vertido de petróleo en el mar?* (What is one effect of an oil spill in the ocean?) *¿Cuál es una de las causas del calentamiento global?* (What is one of the causes of global warming?) *Expliquen la relación de causa y efecto en este caso: “[...] el suelo es muy frágil y [...] los que son fértiles se deterioran como consecuencia de la explotación humana y de la erosión”* (p. 44). (Explain the cause-and-effect relationship in this case: “soils are very fragile, and those that are fertile are damaged due to human action and erosion.”)
- Ask students to reread the spread on pages 60–61, paying special attention to cause and effect relationships. Next, have students fill in a cause and effect chart (Graphic Organizer #4) for this spread. Then ask students to discuss their charts with a classmate, evaluating and explaining their choices.
- Ask students to reread the spread on pages 44–45 and take notes on the damage caused by intensive agriculture. Next, have students consider the role of intensive agriculture in feeding the world. Then hold a debate. Divide the class into two groups. Each group will represent one opinion: the need for limiting intensive agriculture to protect the environment or the need to promote it to produce more food. Each member of the team will have a specific responsibility: moderator, lead debater, questioner, question responder, rebutter, and summarizer. After the debate, challenge students to try to think of a possible solution or compromise.



► CONNECTION WITH CONTENT AREAS: SCIENCE, MATHEMATICS

INSTRUCTIONAL FOCUS:

Building Knowledge in the Content Areas



- ▶ Have students work collaboratively in small groups to create and make a presentation about one of the phenomena or pollution issues discussed in the book. You may wish to assign the topics to avoid duplication of information. If available in your classroom, encourage students to use technology (e.g., slide presentation, online images, interactive whiteboard) for their presentations. Require that all students in the group participate in the presentation. Encourage them to use the domain-specific vocabulary they have learned in their presentations. 
- ▶ Divide the class into small groups and assign each group a different experiment that could be easily done in class. For example: checking the density of different liquids (p. 7), generating water waves (pp. 16–17), changing the state of water (p. 19), making a spinning top to create an optical illusion (p. 41), using magnets to study magnetism (p. 49). Allow students time to plan and do their experiments. Then invite them to explain the results to the class.
- ▶ Explain that the metric system is frequently used in the scientific world. Provide students with these unit equivalencies: 1 km = .62 miles; 1 meter = 3.28 feet; 1 centimeter = .39 inches. Then have students use a calculator to convert the measurements included on pages 16–17 and 58–59 from the metric system into the U.S. customary system. Do students get the same results as those provided in parentheses in the book? Invite volunteers to present their results to the class and explain how they did the calculations.

► WRITING

INSTRUCTIONAL FOCUS:

Writing from Sources / Research Strand



Have students write a cause-and-effect essay about one of the phenomena or pollution issues introduced in the book. Encourage students to create an outline before they begin writing. Suggest this structure: I. Introduction stating the topic and a thesis or controlling idea that introduces the cause-effect relationship; II. Body—consisting of three paragraphs—including key details, examples, quotations, and other relevant information; III. Conclusion summarizing the cause-effect relationship and explaining why this is important information. In addition to using their graphic organizers, presentation, and the book, have students consult other sources (e.g., an encyclopedia, a science book, online resources) to verify the accuracy of the information and to add supporting data. Remind students to provide a list of sources at the end of their essays. Guide students through the writing process by assisting them in planning their writing, developing a draft, revising and editing it, and producing their final work. As students revise and edit their work, have them pay attention to the conventions of Spanish grammar and punctuation. 



Informal Assessment

You may wish to assess a student's progress as he or she completes comprehension and production activities. Suggested activities are identified with the icon.



Nombre _____

Vocabulario

A Completa las oraciones con las palabras correctas.

emerge

oscilan

intermitentes

nociva

abertura

constatar

1. Se ha podido constatar que la Tierra tiene forma esférica.
2. La lava emerge por una abertura en la corteza de la Tierra.
3. En un terremoto, los objetos oscilan.
4. Los géiseres son erupciones intermitentes de agua.

B Consulta un diccionario y escribe cuatro definiciones de esta palabra.

disposición

1. DEFINICIÓN #1: estado de ánimo o de salud
2. DEFINICIÓN #2: orden o colocación de algo
3. DEFINICIÓN #3: mandato, norma o ley
4. DEFINICIÓN #4: habilidad para algo

¿Qué definición corresponde al uso de *fallar* en la página 34? ¿Cómo lo sabes?

Corresponde a la definición #2 porque en la página 11 se habla de cómo están colocadas las placas terrestres.

C Completa la palabra en cada oración con el prefijo o sufijo adecuado.

geo

cida

grafo

hidro

1. Para medir los tsunamis se usa un mareó grafo.
2. El herbi cida es un producto químico que destruye las hierbas.
3. Las centrales hidro eléctricas usan la fuerza del agua para producir electricidad.
4. El norte magnético de la brújula se orienta hacia el Norte geo gráfico porque es atraído por un polo sur magnético.



Nombre _____

Comprensión lectora

A Contesta

1. ¿Qué es la deriva continental? ¿Qué pruebas existen de este fenómeno?

Possible answer: Los continentes se mueven y hace 200 millones de años estuvieron unidos.

Se sabe porque los continentes encajan como piezas de un rompecabezas y porque coinciden algunos fósiles.

2. ¿Cuáles son las causas de la desertización? ¿Cómo se puede combatir?

Possible answer: La explotación humana del suelo y la erosión. Se debe reforestar, rotar los cultivos y permitir que los suelos descansen.

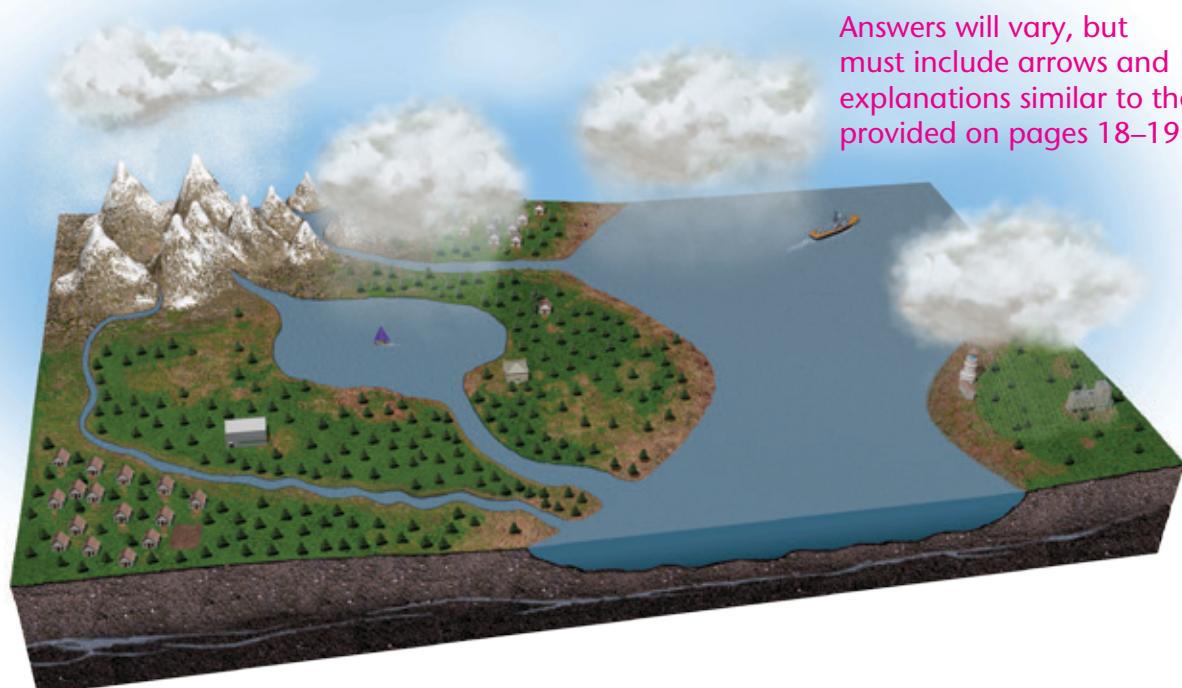
3. ¿Por qué se dice que "nuestro planeta es un imán gigantesco" (pág. 48)?

Possible answer: Porque en su interior hay materiales magnéticos y tiene dos polos.

B Completa esta tabla con palabras relacionadas que aparecen en el texto.

CAUSA	EFFECTO
Se produce un terremoto de gran magnitud en el océano.	Llega un tsunami a la costa.
la explotación y erosión del suelo fértil	la desertización

C Completa el diagrama del ciclo del agua y explica qué sucede en cada etapa.



Answers will vary, but must include arrows and explanations similar to those provided on pages 18–19.



Nombre _____

Vocabulario

A Completa las oraciones con las palabras correctas.

emerge

oscilan

intermitentes

nociva

abertura

constatar

1. Se ha podido _____ que la Tierra tiene forma esférica.
2. La lava _____ por una _____ en la corteza de la Tierra.
3. En un terremoto, los objetos _____.
4. Los géiseres son erupciones _____ de agua.

B Consulta un diccionario y escribe cuatro definiciones de esta palabra.

disposición

1. DEFINICIÓN #1: _____
2. DEFINICIÓN #2: _____
3. DEFINICIÓN #3: _____
4. DEFINICIÓN #4: _____

¿Qué definición corresponde al uso de *fallar* en la página 34? ¿Cómo lo sabes?

C Completa la palabra en cada oración con el prefijo o sufijo adecuado.

geo

cida

grafo

hidro

1. Para medir los tsunamis se usa un mareó_____.
2. El herbi_____ es un producto químico que destruye las hierbas.
3. Las centrales _____ eléctricas usan la fuerza del agua para producir electricidad.
4. El norte magnético de la brújula se orienta hacia el Norte _____ gráfico porque es atraído por un polo sur magnético.



Nombre _____

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A Contesta

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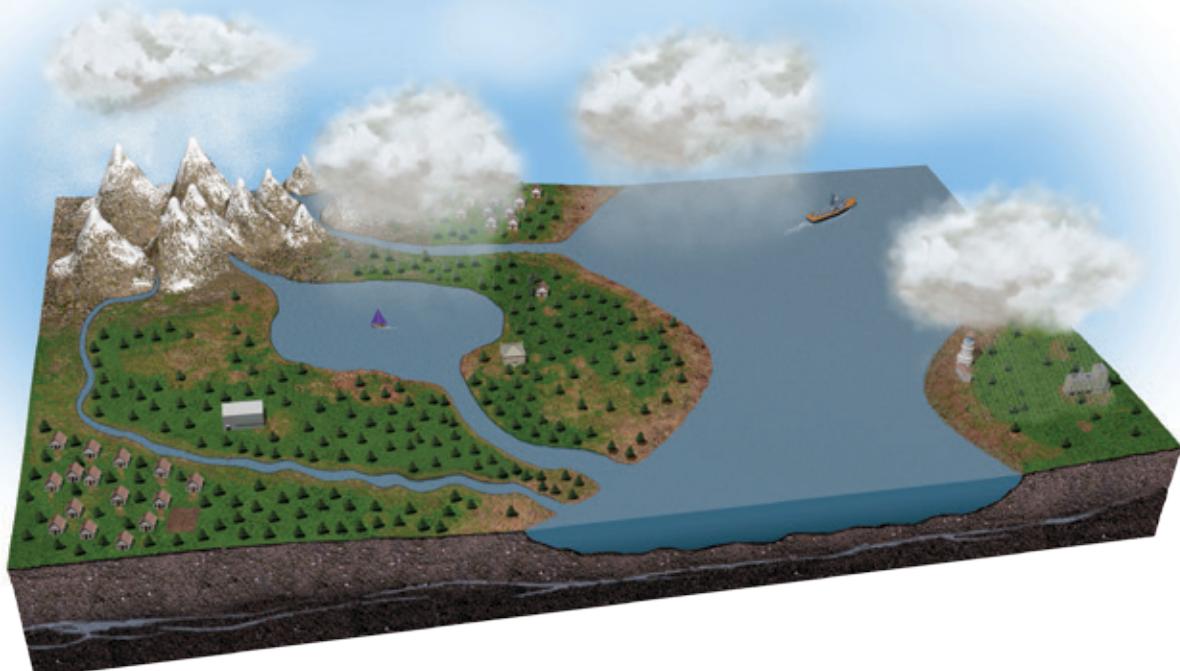
2. ¿Cuáles son las causas de la desertización? ¿Cómo se puede combatir?

3. ¿Por qué se dice que "nuestro planeta es un imán gigantesco" (pág. 48)?

B Completa esta tabla con palabras relacionadas que aparecen en el texto.

CAUSA	EFFECTO
Se produce un terremoto de gran magnitud en el océano.	
la explotación y erosión del suelo fértil	

C Completa el diagrama del ciclo del agua y explica qué sucede en cada etapa.



El Abecé Visual de la Tierra



Lesson Plan and Activities

Written in accordance with the Language Arts, Social Studies, and Science Standards

El Abecé Visual del Universo

Author: JUAN ANDRÉS TURRI

Illustrator: CLAUDIO GONZÁLEZ

COMPLEXITY

F&P Guided Reading Level X / Lexile Level 960L

TEXT TYPE

Informational Text: Science

OBJECTIVES

- ➔ Demonstrate comprehension of an astronomy text.
- ➔ Use descriptions to visualize and better understand a text.
- ➔ Summarize and present information.
- ➔ Compare and contrast information in an informational text.
- ➔ Identify the author's purpose.



INSTRUCTIONAL FOCUS:

Staircase of Complexity / Reading Rigor

INSTRUCTIONAL FOCUS:

Balancing Informational and Literary Text



Together we foster lifelong readers