



Lesson Plan and Activities

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

El Abecé Visual del Universo

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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

MATERIALS

- ▶ index cards
- ▶ *Diagrama de Venn, Tabla de tres columnas*
(Graphic Organizers #6 and #31)*
- ▶ construction paper
- ▶ drawing materials: pencils, paper, markers, crayons, etc.

SUMMARY

For thousands of years, humans have gazed into the sky with awe, trying to make sense of their observations. This book presents some of the most important celestial bodies and explains several interesting phenomena that take place in space. Over the years, humans have developed hypotheses to explain their observations of space. Most recently, they have created an assortment of machines (e.g., telescopes, satellites, probes) to make more accurate observations. We are now able to explain many of the things we observe in space, but there are still many questions for future scientists to answer.

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, RF 5.4.c, W 5.1, W 5.4, W 5.5, W 5.7, W 5.9.b, W 5.10, SL 5.1, SL 5.2, SL 5.3, SL 5.4, SL 5.5, L 5.1, L 5.2, L 5.3, L 5.4.a, L 5.4.b

SLAR TEKS 5.1.A, 5.2.A, 5.2.B, 5.9.A, 5.10.A, 5.11.A, 5.11.C, 5.11.D, 5.11.E, 5.15, 5.19.A, 5.20.D, 5.21, 5.22.C, 5.23.B, 5.24.A, 5.24.C, 5.24.D, 5.26.A, 5.26.B, 5.26.D, 5.27.A, 5.28.A, 5.29.A

Science TEKS 5.8.A, 5.8.C-D

Social Studies TEKS 5.5.A, 5.23.B-D

NGSS 5-PS2-1, 5-ESS1-1, 5-ESS1-2

VOCABULARY

INSTRUCTIONAL FOCUS:
Academic Vocabulary

aportar – contribuir, dar / to contribute

consenso – acuerdo / consensus

contracción – reducción a un tamaño menor
/ contraction

desintegrarse – romperse y separarse hasta
dejar de existir / to disintegrate

fidedigno – creíble, digno de confianza / reliable

fisonomía – aspecto exterior de algo / features

interponer – poner algo entre dos cosas
/ to place between

intuir – percibir algo por instinto / to sense

propagar – extender a sitios distintos / to spread

significativo – importante / significant

vinculado – relacionado / linked

Advanced Vocabulary

colapsar – deformarse y destruirse un cuerpo
debido a una fuerza / to collapse

diametro – línea recta que pasa por el centro
de un círculo y lo divide en dos partes iguales
/ diameter

halo – cerco luminoso / halo

hemisferio – mitad de la superficie de la esfera
terrestre / hemisphere

hipótesis – suposición o explicación tentativa que
aún no se ha comprobado / hypothesis

morfología – aspecto exterior de algo
/ morphology

rotación – giro de un cuerpo sobre su eje
/ rotation

sonda – cohete o aparato que se envía al espacio
para explorar / space probe

traslación – movimiento de un astro a lo largo
de su órbita / translation

trayectoria – recorrido de un cuerpo por el
espacio / trajectory

tripulación – personal a bordo de un avión o
de una nave / crew

* 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., *comparar, contrastar, diferencia, semejanza*) and instruction words, such as *cita, explica, infiere, justifica, predice, resume*.
- ▶ Ask students to explain what each word means in their own words. 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.
- ▶ Remind students that analyzing context clues will help them figure out the meaning of words. Sometimes the author provides examples, explanations, or synonyms to clarify the meaning of words. For example: *masivas*: “*o densas*” (p. 8); *teoría*: “*un modelo matemático*” (p. 16). Have students use the context clues to explain the meaning of these words or phrases: *expandir* (p. 8), *gravedad* (p. 17), *meteorito* (p. 50), *nebulosa* (p. 54), *orbitar* (p. 16), and *radiación térmica* (p. 15).
- ▶ Point out the prefix *des-* (opposite) in *desintegrarse* and the prefix *inter-* (between) in *interponer*. Then introduce the prefixes *in-* (negation) and *sub-* (below). Next, have students explain the meaning of *desprender* (to become detached) on page 17, *desvelar* (to uncover) on page 17, *indirecto* (indirect) on page 48, *infinito* (infinite) on page 7, *inusualmente* (unusually) on page 29, *interestelar* (interstellar) on page 13, *internacional* (international) on page 18, *interplanetario* (interplanetary) on page 18, *subsuelo* (underground) on page 38, and *subtipo* (subtype) on page 13. Ask students to write sentences for each of these words.
- ▶ Explain that many words in Spanish have Greek or Latin origins. Point out these word parts: *morfo* (shape, form) and *logía* (study) in *morfología*, and *hemi* (half) in *hemisferio*. Next, introduce *crono* (time), *foto* (light), *geo* (Earth), *helio* (sun), *infra* (below), *peri* (around), *proto* (first, earliest), and *ultra* (beyond). Then have students determine the meaning of *cronología* (p. 35), *fotosfera* (p. 29), *geocéntrico* (p. 26), *heliocéntrico* (p. 26), *infrarrojo* (p. 15), *perigeo* (p. 33), *protoplanetario* (p. 35), and *ultravioleta* (p. 14).
- ▶ Form two teams and play “Password.” Give a word from the vocabulary list to be guessed (the “password”) to one of the players. He or she then gives a one-phrase clue to a partner from the same team who must attempt to guess the word. Alternate between the two teams.

► READING

PRE-READING

- ▶ Discuss with students what they know about our solar system and space. Ask: *¿Cuál es la estrella de nuestro sistema solar? ¿Cuántos planetas pueden nombrar?* (What is the star of our solar system? How many planets can you name?) *¿Qué otros tipos de astros conocen? Describanlos.* (What other types of celestial bodies do you know? Describe them.)
- ▶ 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 celestial body or phenomenon in space. 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: *¿En qué consiste la teoría del Big Bang? ¿Qué trata de explicar?* (What is the Big Bang theory about? What does it attempt to explain?) *¿Qué es la “materia oscura”?* (What is “dark matter”?) *¿Qué hipótesis intentan explicar el futuro del Universo?* (What hypotheses attempt to explain the future of the universe?) *¿Por qué se cree que el Universo está en expansión?* (Why is it believed that the universe is expanding?)
- ▶ Use the spread about the galaxies on pages 12–13 to explain to students how visual elements, comparisons the author makes, and detailed descriptions help the reader create a mental picture. Point out these examples: “*La galaxia tiene varios brazos en espiral*” (p. 12); “*nacen, crecen [...], mueren*” (p. 12); “*en el núcleo las estrellas forman una barra cruzada*” (p. 13). Have pairs of students take turns reading the spread aloud to each other. Then ask: *Citen las palabras que usa el autor para describir las galaxias espirales. ¿Cómo los ayuda esa descripción a visualizar ese tipo de galaxias?* (Quote the words the author uses to describe spiral galaxies. How does that description help you visualize that type of galaxies?) *¿Con qué compara el autor las galaxias elípticas?* (With what does the author compare elliptical galaxies?) *Observen la foto de las nubes de Magallanes en la página 13. ¿Qué características les indican que se trata de una galaxia irregular?* (Look at the photo of the Magellanic Clouds on page 13. What features tell you that this is an irregular galaxy?)
- ▶ Assign different spreads and have students read independently. Distribute three-column charts (Graphic Organizer #31) and ask students to label the columns as follows: *Cuerpo celeste o fenómeno astronómico, Características, Datos importantes.* Students should fill in the chart as they read. After they finish reading their assigned spread, have them summarize what they read in a paragraph, using their chart as a guide. Then have them work in pairs taking turns to read their paragraph with appropriate expression. As each student reads, his or her partner should think of two or three questions about the content. Students should attempt to answer their partners' questions. Monitor and assist students as needed.

INSTRUCTIONAL FOCUS:

Text-based Answers / Critical Analysis





DIFFERENTIATED INSTRUCTION

B BELOW-LEVEL STUDENTS

- Have students answer these or similar comprehension questions with short phrases or incomplete sentences: *¿Qué son los agujeros negros? ¿Qué ocurre en ellos?* (What are black holes? What happens in them?) *¿Qué es un “año luz”?* *Da un ejemplo utilizando años luz.* (What is a light year? Provide an example using light years.) *¿Qué ocurre en un eclipse solar?* (What happens in a solar eclipse?)

AT-LEVEL STUDENTS

- Encourage students to make inferences and predictions based on the text, using short sentences. Ask these or similar questions: *¿Por qué “las galaxias tienen una vida dinámica”* (p. 12)? *Cita evidencias del texto.* (Why do “galaxies have an active life”? Cite text evidence.) *¿Por qué algunos científicos creen que hubo vida en Marte?* *¿Cuál sería la importancia de poder demostrar eso?* (Why do some scientists think there was life on Mars? What would be the importance of proving that?) *Describe qué sucederá en nuestro sistema solar cuando el Sol muera, en unos 5000 millones de años.* (Describe what will happen in our solar system when the Sun dies, in about 5 billion years.)

ABOVE-LEVEL STUDENTS

- Encourage students to analyze and evaluate the text, using complete and elaborate answers. Ask these or similar questions: *Explica: “Desde la Tierra vemos el pasado de una estrella”* (p. 20). *Da ejemplos del texto.* (Explain: “From Earth we are looking into the past of stars.” Provide examples from text.) *Vuelve a leer las páginas 60 y 61. ¿Cómo cambiarían el clima y las estaciones de la Tierra si su eje no estuviera inclinado?* (Reread pages 60 and 61. How would Earth’s climate and seasons change if its axis was not tilted?)

POST-READING

- Explain that understanding how two things are alike (*comparar*) and how they are different (*contrastar*) helps us connect ideas. Focus students’ attention on the spreads on pages 34–35 and on pages 50–51, and then ask: *Mencionen dos semejanzas entre los cometas y los meteoroides. Luego, mencionen dos diferencias.* (Tell two similarities between comets and meteoroids. Then tell two differences.) *¿Cuál de estos dos cuerpos celestes ha dejado huellas en la Tierra?* (Which of these two celestial bodies has left marks on Earth?) *¿En qué se parecen y se diferencian la forma y estructura de estos dos cuerpos celestes?* (How are the shape and structure of these two celestial bodies similar and different?)
- Distribute a Venn diagram (Graphic Organizer #6) to students. Then, have them reread the spreads on pages 48–49 and 58–59 and fill in the diagram comparing and contrasting solar and lunar eclipses as they reread the text. Next, have students present their diagrams to a classmate and discuss the differences (*diferencias*) and similarities (*semejanzas*) between these two phenomena. Encourage partners to add information or make suggestions or corrections, as appropriate.
- Revisit the question *¿Qué esperan aprender al leer este libro?* (What do you expect to learn by reading this book?) from the Pre-Reading section, and ask: *¿Qué aprendieron al leer este libro?* (What did you learn by reading this book?) *¿Con qué propósito creen que el autor escribió el libro?* (What do you think the author’s purpose for writing this book was?)



► CONNECTION WITH CONTENT AREAS: SCIENCE

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 celestial bodies or phenomena presented in the book (e.g., galaxies, stars, moons, meteorites, the Big Bang, eclipses, shooting starts). 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. 
- ▶ Explain that numerous scientists have contributed to our understanding of the universe. Divide the class into small groups and assign one of the following scientists to each group: Albert Einstein, Galileo Galilei, Edmond Halley, Edwin Hubble, Charles Messier, Isaac Newton. Distribute construction paper and have students prepare a poster for their assigned scientist. Students should research the scientist and prepare a biographical profile in which they include basic family information, work, discoveries, and other relevant information about the person. You may want to suggest some reference materials and online resources. Encourage students to include images. Require students to include a list of sources on the back of their posters. Exhibit students' posters in class.

► WRITING

INSTRUCTIONAL FOCUS:

Writing from Sources / Research Strand



Have students write an editorial stating their position on the need for the study and exploration of space. Students should make a claim either for or against the promotion and funding of programs and institutions that have the study and exploration of space as a goal. In addition to using their notes, graphic organizers, presentations, and the text, have students consult reference materials to find facts to back up their positions. Before they begin writing, have students create an outline. Suggest this structure: I. Introduction: stating the claim being supported; II. Body: consisting of three paragraphs supporting the claim with well-argued reasons and facts; III. Conclusion: summarizing the most important details and restating the claim. Remind students that they should establish and maintain a formal style. Guide and assist them through the writing process. As students revise and edit their work, have them pay attention to the conventions of Spanish grammar and punctuation. Encourage students to share their final work with the class by reading it aloud. Invite the class to evaluate how persuasive each editorial is. 



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 Une.

- | | |
|------------------|--------------------------|
| 1. aportar | a. creíble |
| 2. consenso | b. importante |
| 3. fidedigna | c. acuerdo |
| 4. intuir | d. relacionado |
| 5. significativo | e. contribuir |
| 6. vinculado | f. percibir por instinto |

B Reemplaza lo que está en negrita con una palabra del recuadro y escribe la nueva oración.

contracción

desintegran

interpone

propaga

1. Casi todos los meteoroides se **rompen y desaparecen** en la atmósfera.

desintegran / Casi todos los meteoroides se desintegran en la atmósfera.

2. La energía del Sol se **extiende** por todo el sistema solar.

propaga / La energía del Sol se propaga por todo el sistema solar.

3. Al final de su vida, las estrellas sufren una **reducción de tamaño**.

contracción / Al final de su vida, las estrellas sufren una contracción.

4. En un eclipse de Sol, la Luna se **pone en medio** del Sol y la Tierra.

interpone / En un eclipse de Sol, la Luna se interpone entre el Sol y la Tierra.

C Añade la raíz o el sufijo correcto y define las palabras.

helio

hemi

logía

morfo

1. crono logía : estudio del paso del tiempo

2. morfo logía: estudio de la forma y estructura

3. hemi sferio: mitad de la superficie terrestre

4. peri helio : cercano al Sol



Nombre _____

Comprensión lectora

A Une.

- | | |
|---------------------|--|
| 1. satélite natural | a. objeto rocoso o metálico menor que un planeta |
| 2. galaxia | b. cuerpo celeste que gira alrededor de una estrella |
| 3. asteroide | c. roca o mineral que impacta la Tierra |
| 4. cometa | d. rota alrededor de otro cuerpo celeste mayor |
| 5. meteorito | e. cuerpo celeste con núcleo o cabeza y colas |
| 6. planeta | f. concentración inmensa de estrellas, polvo y gases |

B Describe uno de los cuerpos celestes que se presentan en el texto.

Cuerpo celeste: _____

Materiales de los que está hecho(a): _____

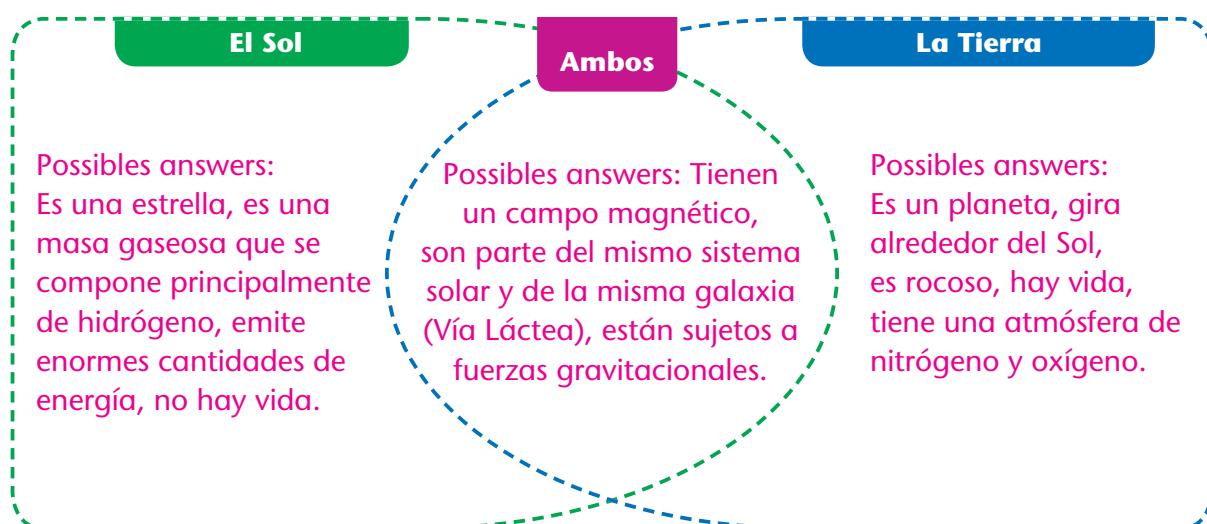
Cómo se forma: _____

Dónde se encuentra: _____

Características principales y otros datos de interés:

Answers will vary.

C Compara y contrasta estos dos cuerpos celestes.





Nombre _____

Vocabulario

A Une.

- | | |
|------------------|--------------------------|
| 1. aportar | a. creíble |
| 2. consenso | b. importante |
| 3. fidedigna | c. acuerdo |
| 4. intuir | d. relacionado |
| 5. significativo | e. contribuir |
| 6. vinculado | f. percibir por instinto |

B Reemplaza lo que está en negrita con una palabra del recuadro y escribe la nueva oración.

contracción

desintegran

interpone

propaga

1. Casi todos los meteoroides se **rompen y desaparecen** en la atmósfera.
-

2. La energía del Sol se **extiende** por todo el sistema solar.
-

3. Al final de su vida, las estrellas sufren una **reducción de tamaño**.
-

4. En un eclipse de Sol, la Luna se **pone en medio** del Sol y la Tierra.
-

C Añade la raíz o el sufijo correcto y define las palabras.

helio

hemi

logía

morfo

1. crono_____:

2. _____logía:

3. _____sferio:

4. peri_____:



Nombre _____

Comprensión lectora

A Une.

- | | |
|---------------------|--|
| 1. satélite natural | a. objeto rocoso o metálico menor que un planeta |
| 2. galaxia | b. cuerpo celeste que gira alrededor de una estrella |
| 3. asteroide | c. roca o mineral que impacta la Tierra |
| 4. cometa | d. rota alrededor de otro cuerpo celeste mayor |
| 5. meteorito | e. cuerpo celeste con núcleo o cabeza y colas |
| 6. planeta | f. concentración inmensa de estrellas, polvo y gases |

B Describe uno de los cuerpos celestes que se presentan en el texto.

Cuerpo celeste: _____

Materiales de los que está hecho(a): _____

Cómo se forma: _____

Dónde se encuentra: _____

Características principales y otros datos de interés:

C Compara y contrasta estos dos cuerpos celestes.

