NASA Spotlite
Interactive Lesson

Composition of Earth's Atmosphere
Grades 5-8

Student Packet

NASA Spotlite Interactive Lesson

Science for students by students

What are NASA Spotlites?

NASA Spotlites are 90-120 second student-produced video segments that address common science misconceptions.

NASA Spotlites are designed to increase scientific literacy in a standards-based classroom. By producing Spotlite videos, students gain production experience, as well as deepen their understanding of science content. Approved NASA Spotlites can be found at the NASA eClips™ website.
https:nasaeclips.arc.nasa.gov

A misconception is a view or opinion that is incorrect because it is based on faulty thinking or understanding.

This is an Interactive PDF. Features in this packet may include:

- fillable boxes
- quick checks
- multiple choice questions
- interactive GIFs (graphics interchange format)
- links to videos and online interactives

The hyperlinks included in this document open PDFs or webpages and may perform differently based on the device being used. Links may have to be cut and pasted into a web browser to open. PDFs and other documents may need to be downloaded to view.

Try using Adobe Acrobat Reader and Flash Player for optimal performance of all interactive features included in this guide.

Remember to save your responses.
Under "file" choose "save as." Type your name in front of the document name. Choose "save."

Composition of Earth's Atmosphere
Pretest / Posttest
NASA Spotlite Interactive Lesson

Read each question and select the best choice.

1. The layer of gases that surrounds Earth is called the:

Select the best answer.
A. lithosphere
B. atmosphere
C. biosphere
D. hydrosphere

2. The most abundant gas in Earth's atmosphere is:

Select the best answer.
A. oxygen
B. nitrogen
C. helium
D. hydrogen

3. Which of the following is not a naturally occurring part of Earth's atmosphere?

Select the best answer.
A. gases such as oxygen
B. gases such as carbon dioxide
C. dust and other tiny solid particles
D. sulfur oxides from factories

4. Nitrogen gets returned to the atmosphere through

Select the best answer.
A. the nitrogen cycle
B. precipitation
C. the water cycle
D. animal waste

5. Which statement about Earth's atmosphere is incorrect?

Select the best answer.
A. It contains the gases nitrogen and argon.
B. It contains the gases carbon dioxide and nitrogen.
C. It consists mostly of oxygen.
D. It contains tiny solid particles like dust and pollen.

Engage

In today's lesson you will learn about the composition of Earth's atmosphere. Using interactive Frayer Models, you will learn key vocabulary that will help you form a clearer understanding of the elements, compounds, and other materials that make up our atmosphere.

What do you already know about the gases in Earth's atmosphere?

True or False: Oxygen is the most abundant gas in Earth's atmosphere.

Select the best answer.
True
False

Spotlite Video

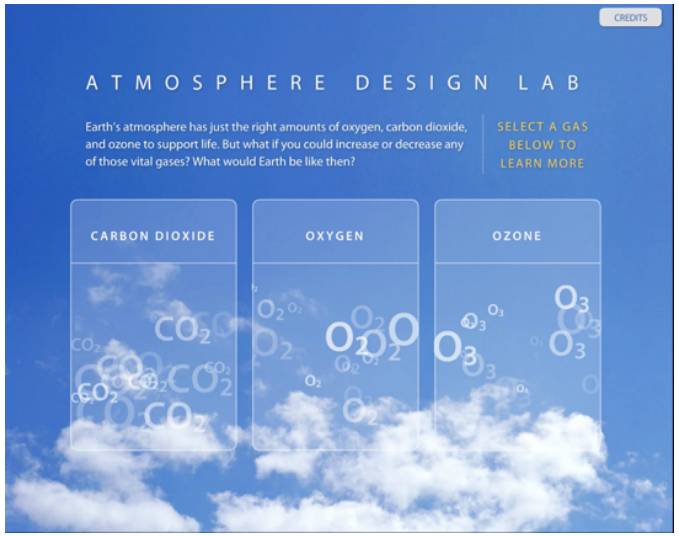
Next, you will watch a short video about Earth's atmosphere. As you watch the video, pay close attention to any new vocabulary.

Video Link- NASA Spotlite: Composition of Earth's Atmosphere NASA eClips Website - https://nasaeclips.arc.nasa.gov/spotlite/earths-atmosphere/earths-atmosphere
NASA eClips YouTube - https://youtu.be/e-wYfLpRl3U

Explore

Explore Activity

Use this interactive to explore carbon dioxide, oxygen and ozone in Earth's atmosphere.



Resource Link - http://forces.si.edu/atmosphere/interactive/atmosphere.html
This link gives you the option to use Flash or HTML.

What did you learn about increasing or decreasing the amount of the following found in Earth's atmosphere?

1. carbon dioxide
2. oxygen
3. ozone

This chart show the gases in Earth's atmosphere.

Gases	Amount in Earth's Atmosphere
Oxygen (O2)	21.0%
Argon (Ar)	0.9%
Nitrogen (N2)	78.0%
Carbon dioxide (CO2)	0.035%

Graph the data on the table. What does it show about the gases in the atmosphere?

Explore

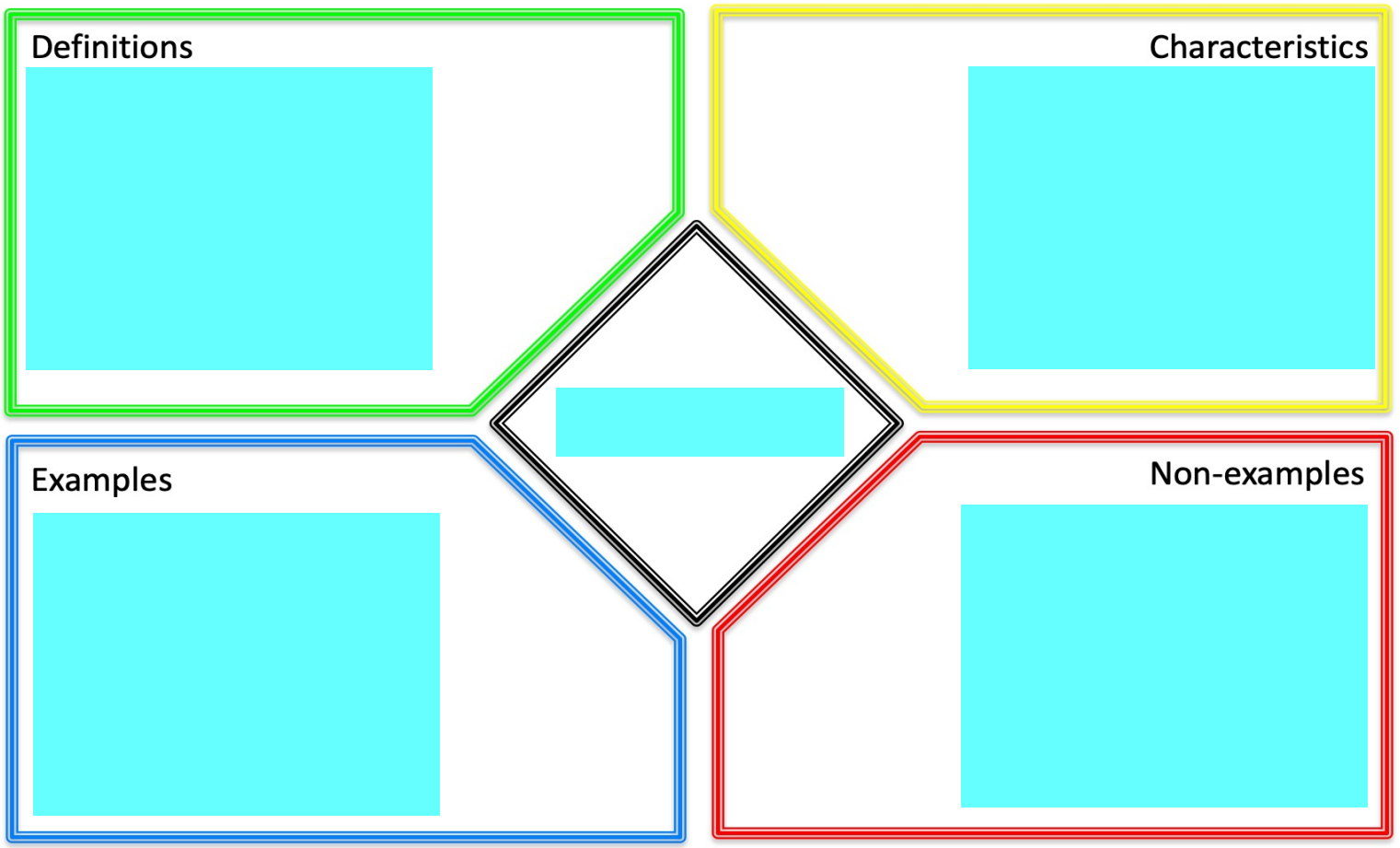
Think-Pair-Share

Do you find it surprising that oxygen is not the most abundant gas in Earth's atmosphere? Why or why not? What other gases/materials do you think make up the remaining 1% of the atmosphere?

Explain

Frayer Model for Vocabulary Development

Use the graphic organizer to write definitions, characteristics, examples and non-examples for a vocabulary word. You can include drawings, graphics, and diagrams.



NASA Connection

Compare Earth's Atmosphere to the Atmospheres of Mars and Earth's Moon.

In the near future, NASA has plans to return to the Moon and continue studying Mars. Draw three pie graphs that illustrate the composition of the atmospheres for Earth, Mars and Earth's moon.

Object	Mass (kilograms)	Carbon Dioxide	Nitrogen	Oxygen	Argon	Methane	Sodium	Hydrogen	Helium	Other
Sun	$3.0x10^{30}$							71%	26%	3%
Mercury	1000			42%			22%	22%	6%	8%
Venus	$4.8x10^{20}$	96%	4%							
Earth	$1.4x10^{21}$		78%	21%	1%					<1%
Moon	100,000				70%		1%		29%	
Mars	$2.5x10^{16}$	95%	2.7%		1.6%					0.7%
Jupiter	$1.9x10^{27}$							89.8%	10.2%	
Saturn	$5.4x10^{26}$							96.3%	3.2%	0.5%
Titan	$9.1x10^{18}$		97%			2%				1%
Uranus	$8.6x10^{25}$					2.3%		82.5%	15.2%	
Neptune	$1.0x10^{26}$					1.0%		80%	19%	
Pluto	$1.3x10^{14}$	8%	90%			2%				

Image and activity source - https://spacemath.gsfc.nasa.gov/astrob/10Page7.pdf

1. How does Earth's atmosphere compare with that of the Moon? Mars?

2. Which planet has the greatest percentage of oxygen in its atmosphere? the greatest percentage of nitrogen?

Does Air Contain Water Vapor?

To further explore the composition of Earth's atmosphere, have students complete this investigation to determine if air contains water vapor.

Think About This!

Have you ever observed water droplets on the outside of a glass when you were drinking a cold drink on a very warm day? Where did these droplets come from? Did the liquid seep through the glass to the outside? How do you know? Could you test a prediction about this phenomenon?

Image and Activity Source - Meteorology Activities for Grades 5-9
https://science.nasa.gov/does-air-contain-water-vapor

Evaluate

Identify Misconception

What is a common misconception about the composition of Earth's atmosphere and how can you correct it?

Carefully rewatch the NASA Spotlite video about the composition of Earth's atmosphere to assess your understanding of what make up the atmosphere.

Video Link- NASA Spotlite: Composition of Earth's Atmosphere
NASA eClips™ Website - https://nasaeclips.arc.nasa.gov/spotlite/earths-atmosphere/earths-atmosphere
NASA eClips™ YouTube - https://youtu.be/e-wYfLpRl3U

Vocabulary Review

Fill-in-the-blanks activity using vocabulary about the components of Earth's atmosphere.

The layers of gases surrounding Earth is called the 1) ____. Earth's atmosphere is a mixture of elements and compounds called air.

oxygen

A substance formed by the chemical combination of two or more elements are 2) ____. Carbon dioxide and water vapor are the most abundant compounds in the atmosphere.

oxygen

Substances that cannot be separated or broken down into simpler substances by chemical means are 3) ____ .

oxygen

In Earth's atmosphere, the most abundant element is 4) ____.

oxygen

The element 5) ____ only makes up 21% of the air.

oxygen

Product Information

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