

SPACE SCIENCE

Answer Key: Grades 7–8 Lesson Extensions

Notes:

- This answer key should be used as a guide for basic responses to the questions and instructions found in the grades 7–8 lesson extensions. The children should be encouraged to make their science journals tidy, beautiful, and exceptionally well-done.
- Encourage the children to write their answers in their own words, with definitions being a possible exception.
- There are two types of answers provided in this answer key:

Sample answers: Most questions are open ended, so the children’s answers will not match the provided text exactly or include everything provided in the sample answer. However, some answers should match more closely (for example, vocabulary word definitions, copied charts, etc.).

Answers will vary: This is used when there will be great variation in the children’s answers. Refer to the text in the lesson to check these answers.

Lesson 1

2. *Imagine you are an astronomer who invents a new unit of measure that is greater than light-years to calculate the distance between galaxies. In your science journal, record what you would call it and why.*

Answers will vary. Answers should reflect information found in the lesson extension.

Lesson 2

2. *The mnemonic phrase “My Very Enthusiastic Mother Just Served Us Noodles” helps you remember the order of the planets. Create a mnemonic sentence or phrase to help you remember the order of spectral types for stars (O, B, A, F, G, K, M).*

Answers will vary. Answers should reflect information found in the lesson extension.

Lesson 3

2. *Would you want to go on a trip between the Polynesian islands on a traditional canoe? Imagine that you are taking such a voyage. Write a paragraph describing what it would be like to be on a Polynesian boat, including the navigation methods used.*

Answers will vary. Answers should reflect information found in the lesson extension.

Lesson 4

2. *Write at least three ways that exoplanets differ from those in our solar system.*

Sample answer:

Exoplanets can be found orbiting dead stars, they can have irregular orbits, and they can be super-Earths.

Lesson 5

2. *Write a short paragraph response. What were some of the challenges that had to be overcome to land a probe on Venus? Give an example of something the scientists learned despite their failures. Do you think it was worth it to send all those probes to Venus?*

Sample answer:

Successfully landing a probe on Venus proved to be very difficult, and it wasn’t until the fourth probe that scientists began to collect helpful data about the planet. Each failure taught the scientists information that led to the next step in discovering more about Venus. Through the many attempts to land a probe on Venus, scientists learned that Venus is a burning-hot planet with crushing atmospheric pressure. The

planet has high-speed atmospheric winds and sulfuric acid clouds. Scientists never would have learned important data about Venus if they had not persevered in sending probes to Venus. It was worth it to send all those probes to Venus for the scientific and technical knowledge gained.

Lesson 6

2. Draw a picture of a rover that you would send to Mars. Think about what features would be important for a successful mission and what the goals of your mission would be.

Answers will vary. Drawings will vary but should reflect information found in the lesson extension.

3. Write a paragraph (4–6 sentences) explaining what you would like to learn about Mars.

Answers will vary.

Lesson 7

2. If you complete the optional activity, write a paragraph describing the results of your experiment. How did the distance of the tennis ball change the outcome?

Answers will vary. Answers should reflect information found in the lesson extension and the experiment results.

3. If you do not complete the activity, imagine you are viewing a solar eclipse and describe in a paragraph what you would see, what you would feel, and what you would need to view the eclipse.

Sample answer:

I see a progression of the moon moving to cover the sun over time. Once it is directly over the sun, I only see a crown (the corona) around the sun. As the sun is being blocked, the daylight gets dimmer, and the temperature becomes cooler. Looking directly into a solar eclipse is damaging to the eye, so I use solar eclipse glasses to safely look at the solar eclipse.

Lesson 8

2. Imagine that you're the captain of a spaceship that survives a close encounter with a black hole. Write a "captain's log" entry describing the encounter. The entry should be about a paragraph long.

Answers will vary. Answers should reflect information found in the lesson extension.

Lesson 9

2. Write a paragraph describing why Halley's Comet returns in a regular pattern and what you think it would be like to view the comet in the year 2061.

Answers will vary.

Lesson 10

2. Complete one of the following activities:

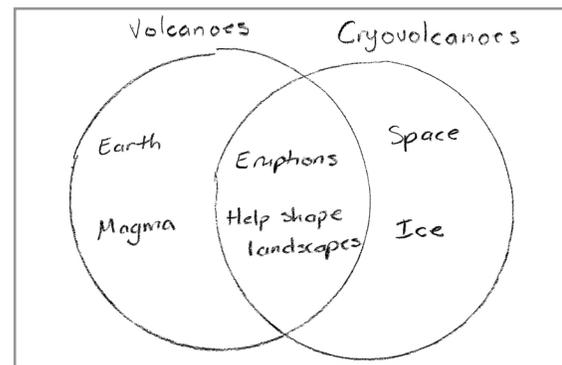
a. Write a brief paragraph explaining at least two ways in which cryovolcanoes are similar to volcanoes on Earth and two ways in which they are different.

Sample answer:

Volcanoes on Earth and cryovolcanoes are similar in that they both are formed as molten material moves through fissures toward the crust. Also, as they erupt, they help change a planet's surface. They are different in that cryovolcanoes erupt with molten ices instead of lava and resemble icy geysers instead of mountains.

b. Create a Venn diagram that includes at least two differences and two similarities between volcanoes and cryovolcanoes.

Sample answer:



Lesson 11

2. In your journal describe the difference between a planet and a dwarf planet. Then write your opinion on whether you think Pluto (and other dwarf planets) should be considered a planet or a dwarf planet and why.

Sample answer:

A planet is able to clear its orbit of objects such as asteroids or other debris, while a dwarf planet's gravity is not strong enough to do so. I think Pluto should be considered a [planet/dwarf planet] because . . .

Lesson 12

2. In your science journal, write 1–2 sentences about each of the following prompts:

a. Describe some of the life challenges that Henrietta Swan Leavitt had to overcome.

Sample answer:

After her family moved to Massachusetts, Henrietta wanted to continue her college education, but she was not able to go to Harvard because it did not enroll women at the time. Later, Henrietta had an illness that led to her losing her hearing completely.

b. How did Henrietta Swan Leavitt’s discoveries impact the study of astronomy?

Sample answer:

Leavitt’s discoveries provided a standard for measuring distances outside our solar system and determining a galaxy’s size. In addition, her discoveries (known as the Leavitt law) helped prove that galaxies existed outside of the Milky Way and that our galaxy was not the center of the universe.

c. What inspired you the most about Henrietta Swan Leavitt?

Sample answer:

I was inspired by the way she persevered despite the obstacles of moving regularly, not being admitted to the college of her choice, and losing her hearing.

Lesson 13

2. In your journal write which job at NASA you would enjoy doing most and why.

Answers will vary. Answers should reflect information found in the lesson extension.

Lesson 14

2. Write a definition for refracting, reflecting, and compound telescopes.

Sample answer:

Refracting telescope: uses a lens to collect and focus light

Reflecting telescope: uses a curved mirror instead of a lens to focus light

Compound telescope: combines both mirrors and lenses to get the best features of both types of telescopes

Lesson 15

2. Write a paragraph in response to the following prompt: what would our world be like if we had never sought to explore space?

Answers will vary. Answers should reflect information found in the lesson extension.