SPACE

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, which may be due in part to one lesson having more information provided than another lesson. Refer to the text in the lesson to check these answers.

Lesson 1

Watch the video "The Scale of Space" at ***goodandbeautiful.com/sciencevideos****. Then 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.

Lesson 2

In your science journal, write a definition for refracting, reflecting, and compound telescopes.

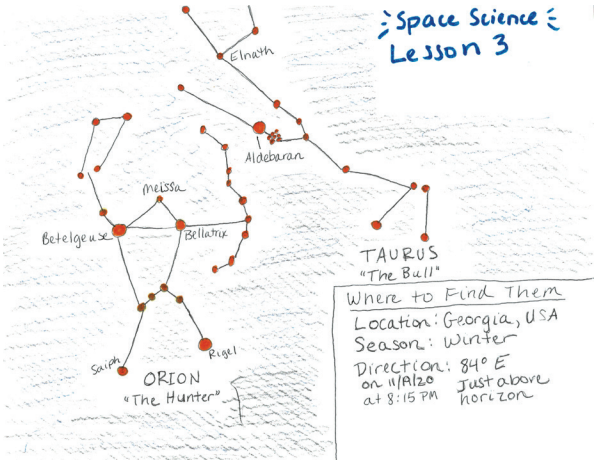
Sample answers:

1. refracting telescope: uses a lens to collect and focus light; requires a long thin tube
2. reflecting telescope: uses a curved mirror instead of a lens to focus light; can have a larger aperture with a shorter tube length
3. compound telescope: combines both mirrors and lenses to get the best features of both types of telescopes

Lesson 3

With permission, use an app (such as SkyView® or Night Sky) or a reputable website to find out which stars are visible in your area during the current season. In your science journal, sketch two constellations visible in the night sky, label them, and write where to find them.

Sample answer:



Lesson 4

In your science journal, write at least two characteristics of a "hot Jupiter"exoplanet. How does it differ from planets in our solar system?

Sample answer:

- Made mostly of gas
- Much hotter than Jupiter
- May evaporate because it orbits so close to its sun
- May leave a comet-like tail as it evaporates
- May eventually evaporate completely, leaving a baked rocky core called a Chthonian planet

A "hot Jupiter" exoplanet differs from some planets in our solar system because it is made mostly of gas, unlike Mercury, Venus, Earth and Mars, and orbits much closer to its sun than planets in our solar system do.

Lesson 5

During the Cold War, the United States and the Soviet Union competed against each other in space exploration. Some people think that this competition drove people to work harder and enhanced the exploration of space. Others think that we could have accomplished more if the two countries had cooperated. Which do you think is correct? Write 2–4 sentences in your journal explaining your opinion.

Answers will vary.

Lesson 6

NASA likes to give its rovers fanciful names like Spirit *and* Opportunity *in order to give people a sense of wonder about the probes. Why do you think they do this? With that in mind, come up with your own name for the next rover to go to Mars. In your journal, briefly explain why you chose that name.*

Answers will vary.

Lesson 7

With permission from a parent, go to ***www.timeanddate.com/eclipse*** *to find out when the next lunar or solar eclipses will occur in your area. Write down the dates in your journal. How old will you be when the next solar eclipse occurs in your country?*

Answers will vary.

Lesson 8

In your journal, discuss the results of your experiment. How does the activity show what is happening during a solar eclipse and a lunar eclipse? Why can you see a lunar eclipse more often than a solar eclipse?

Sample answer:

The activity shows that during a solar eclipse the moon (tennis ball) is between the sun (light source) and the earth (basketball), which casts a shadow of the moon on the earth. During a lunar eclipse, the earth (basketball) is between the sun (light source) and the moon (tennis ball), which casts a shadow of the earth on the moon.

Solar and lunar eclipses happen only when the sun or moon is directly level with the earth, and since the moon's shadow covers only a small portion of the earth's surface, lunar eclipses are more frequent than solar eclipses.

Lesson 9

How old will you be when Halley's comet returns? Write a brief journal entry from the future where you are observing the comet's return. You may include some details of your future life, the technology you're using to view the comet, and so on.

Answers will vary.

Lesson 10

In your journal, 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.

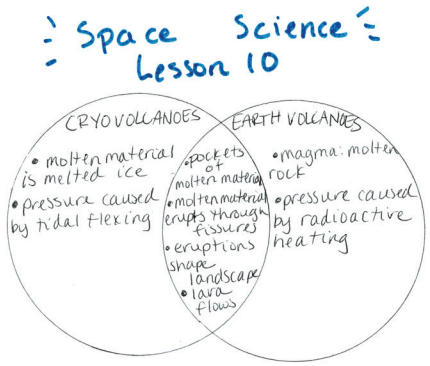
Sample answer:

Cryovolcanoes are similar to volcanoes on Earth because they have pockets of melted ice which act like pockets of magma; both work their way through fissures toward the surface and erupt. Cryovolcano eruptions produce cryolava flows just like lava flows on Earth. Cryovolcano eruptions help shape the landscape of their moons, just as the volcanoes on Earth shape the landscape.

Unlike the magma on Earth, which is made of molten rock, the cryomagma is made of melted ice. These moons experience tidal flexing, which is a force Earth does not experience. Tidal flexing is what causes heat to build up within the moons, causing cryolava eruptions.

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

Sample answer:



Lesson 11

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 planets or dwarfs and why.

Sample answer:

The main difference between a planet and a dwarf planet is that dwarf planets have not cleared their orbit of smaller objects. Their gravity is not strong enough to attract or push away other objects along their orbital path.

Answers will vary for the child's opinion on whether Pluto should be considered a dwarf planet or not.

Lesson 12

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:

Henrietta Swan Leavitt fought through several challenges to become an astronomer. As a child, her family moved around a lot, and she was not allowed to enter her top college of choice because she was female. As a young woman, she became ill and started to lose her hearing.

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

Sample answer:

Leavitt's discovery of the relation of a star's pulse rate to its brightness provided a standard for measuring distances outside our solar system and determining a galaxy's size. Also, Leavitt's work helped other astronomers advance in their research.

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

Answers will vary.

Lesson 13

*Students often use memory devices to help them remember the order of things. For example, you learned the sentence "**M**y **V**ery **E**nthusiastic **M**other **J**ust **S**erved **U**s **N**oodles" to help you remember the order of the planets. Each word represents a planet name. In your journal, try to come up with a sentence or phrase to help you remember the order of spectral types for stars (O, B, A, F, G, K, M).*

Answers will vary.

Lesson 14

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

Answers will vary.

Lesson 15

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

Answers will vary.

