

For each question, select the best answer from the four alternatives.

- Which statement accurately describes the relationship between a spacecraft and a space probe? (10.1) **K/U**
 - A spacecraft is a reusable space probe.
 - A spacecraft carries cargo on a space probe.
 - A space probe is a type of robotic spacecraft.
 - A space probe is a human-occupied spacecraft.
- The Canadarm, Canadarm2, and DEXTRE are
 - robotic tools used on space shuttle missions and the ISS
 - space probes used to explore the Solar System
 - satellite-based navigation systems
 - Canadian-built space shuttles (10.1) **K/U**
- During which of the following missions did the first humans walk on the moon? (10.1) **K/U**
 - Mariner 4*
 - Saturn V*
 - Apollo 11*
 - Apollo 13*

Indicate whether each of the statements is TRUE or FALSE. If you think the statement is false, rewrite it to make it true.

- Galileo Galilei invented the first telescope. (10.1) **K/U**
- Many technologies originally designed for space have made their way into everyday use. (10.3) **K/U**
- In 1997, the NASA *Pathfinder* was used to explore Saturn. (10.1) **K/U**

Copy each of the following statements into your notebook. Fill in the blanks with a word or phrase that correctly completes the sentence.

- In a _____ environment, objects behave as though there is very little gravity affecting them. (10.2) **K/U**

- A telescope that uses mirrors to gather and focus light is a _____ telescope. (10.1) **K/U**
- _____ are human-occupied or robotic vehicles used to explore space or celestial objects. (10.1) **K/U**

Match each term on the left with the appropriate definition on the right.

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|------------------------------|---|
| 10. (a) refracting telescope | (i) forms an image from the visible light spectrum |
| (b) radio telescope | (ii) orbits Earth and detects rays that are not detectable from Earth's surface |
| (c) X-ray telescope | (iii) detects the highest-energy EM waves |
| (d) gamma ray telescope | (iv) collects waves from space and transmits them to a receiver, which amplifies the signal (10.1) K/U |

Write a short answer to each of these questions.

- Why is the moon being used as a testing ground for Mars exploration? (10.1) **K/U**
- List three areas of scientific research that contribute to or benefit from space research and exploration. (10.1, 10.2, 10.3, 10.5) **K/U**
- Name one Canadian astronaut and describe his or her contribution to space exploration. (10.1, 10.2) **K/U**
- Why do astronauts aboard the International Space Station appear to float? (10.1, 10.2) **K/U**
- Describe how the study of space differs from other areas of scientific research in terms of observation methods. (10.1) **T/I**

16. Many countries compete with each other to develop new space technologies. However, space exploration also provides opportunities for countries to work together. Provide evidence to show that space exploration can encourage cooperation among nations. (10.1, 10.2) **T/I**
17. A cost-benefit analysis is a technique used to determine if the benefits that could arise from completing a task outweigh the costs of the task. (10.1, 10.2, 10.3, 10.4) **K/U A**
- (a) Name two of the economic benefits of space exploration.
 - (b) Name two of the costs associated with space exploration.
 - (c) Do the economic benefits of space exploration outweigh the costs? Justify your answer.
18. Which of the following is the most important possible outcome of space exploration? Write a paragraph for your school newspaper justifying your answer. (10.1, 10.2, 10.4, 10.5) **C**
- (a) developing a space tourism industry
 - (b) finding other forms of life
 - (c) establishing a human civilization on another planet
19. (a) List three problems scientists face when living in space. (10.1, 10.2) **K/U T/I**
- (b) Choose one problem that you have listed and describe the solution scientists have developed for the problem.
20. Explain how satellite technology can help people in each of the following situations. (10.3) **A**
- (a) A family wants to get directions to a vacation destination.
 - (b) An ecologist wants to collect data on various Canadian coastlines.
 - (c) A scientist wants to monitor changes in the ozone layer.
21. Imagine you are an astronaut living on the International Space Station. Write a brief journal entry describing your daily activities. (10.1, 10.2) **C**
22. In the next 15 years, NASA plans to build an outpost on the Moon where scientists will conduct research. Some people see this as the first steps toward lunar colonization. Name three challenges that need to be addressed before humans can build colonies on the Moon. (10.2, 10.5) **A**
23. Find evidence to support the statement “Space travel has generated valuable knowledge, but at an enormous cost.” (10.1, 10.2, 10.4, 10.5) **T/I**
24. Canada is a world leader in developing technology for space exploration and research from space. In a paragraph, describe Canada’s contributions to space exploration and research. (10.1, 10.2, 10.3, 10.4, 10.5) **T/I**
25. You are a doctor with a patient suffering from osteoporosis. Based on what you know about astronauts’ routines in space, suggest one thing your patient could do to help fight weakening bones. (10.2) **T/I**