

2023–2024 Gr5 Science Benchmark Unit 4

Question 1.

The students learn that as meteors enter Earth's atmosphere, they speed up and fall toward the ground.

Which statement **best** describes the direction of force that affects the meteor's movement?

- A. The force comes from Earth and pulls the meteor downward.
- B. The force comes from Earth and pushes the meteor across the sky.
- C. The force comes from the Sun and pulls the meteor downward.
- D. The force comes from the Sun and pushes the meteor across the sky.

Question 2.

Which evidence best supports the claim that Earth pulls objects towards its center?

- A. A tennis player hits a ball with a racket. The harder she hits the ball, the faster it travels.
- B. A tennis ball is dropped from a player's hand several times. It falls straight down each time.
- C. A tennis player sets a ball on the court. She returns an hour later, and the ball remains at rest.
- D. A tennis player sees a ball coming across the net. She hits the ball with her racket and changes the direction of the ball.

Question 3.

A group of students is preparing for a science fair. They want to prepare an exhibit that shows how Earth's gravity impacts objects of different masses. One suggestion is that the students drop three different objects of varying mass from a height of 2 meters, record which object hits the ground first, and repeat the experiment multiple times.

What conclusion could the students make about gravity after conducting this experiment?

- A. All objects have mass.
- B. The larger objects will fall to the ground faster than the smaller objects.
- C. The smaller objects will fall to the ground faster than the larger objects.
- D. The objects fall in the same amount of time, regardless of their mass.

Question 4.

Several astronauts live in space Earth's surface on the International Space Station. The International Space Station orbits Earth partly because of Earth's gravity, but it stays in space. The astronauts inside the International Space Station are not pulled down to Earth, but instead they float around in space.

Which conclusion can you make about the strength of Earth's gravitational pull as you move away from Earth's surface?

- A. Earth's gravitational pull doesn't affect other objects in the Solar System.
- B. Earth's gravitational pull only pulls objects down towards Earth's core.
- C. Earth's gravitational pull weakens as you move away from it.
- D. Earth's gravitational pull strengthens as you move away from it.

Question 5.

Earth's gravity pulls objects toward its _____.

- A. axis
- B. center
- C. orbit
- D. moon

Question 6.

A fifth grader visits a kindergarten class to give a talk on stars. One kindergartener says, "The Sun is so big, and it gives off light. I can see it in the daytime. So, is the Sun really a star?"

Which single piece of evidence will best support the fifth grader's answer to the Kindergarten student's question?

- A. The Sun is closer to Earth than other stars.
- B. The Sun gives off its own light.
- C. The Sun looks so big in the sky, and stars are so tiny.
- D. The Sun can be seen in the daytime, and stars are seen only at night.

The following table shows the distance of four stars from Earth in light-years.

A	4.4
B	11.5
C	8.3
D	10.9

Question 7.

Based on this information, select the true statements. Select the **three** that apply.

- A. Star D is older than Star C.
- B. Star A likely appears larger and brighter than Star B because it is closer to Earth.
- C. Star D likely appears smaller and dimmer than Star C because it is farther away from Earth.
- D. Star A likely appears smaller and dimmer than Star C because it is closer to Earth.
- E. Star D likely appears larger and brighter than Star A because it is farther away from Earth.
- F. It takes 4.4 years for the light from Star A to reach Earth.

Question 8.

A student in a science class observes three stars in the sky. He names them Star A, Star B, and Star C. The student makes this claim: "Star A is located closer to Earth than Star B."

What evidence could support the student's claim?

- A. Star A is visible in the sky throughout the year, while Star B is only visible during certain seasons.
- B. Star A appears smaller and dimmer than Star B.
- C. Star B appears smaller and dimmer than Star A.
- D. Star A appears to be closer to the North Star (Polaris) than Star B.

Question 9.

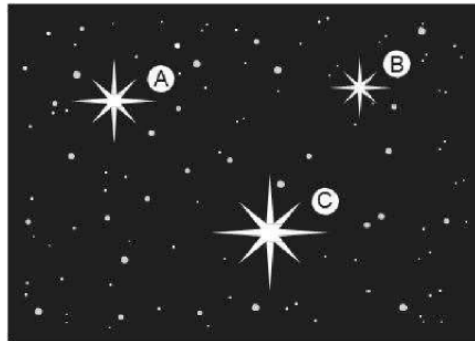
A student's two friends visit her home to show her the identical flashlights they just bought. It is starting to get dark, so they leave for their homes. One friend walks down the sidewalk to the left. The other friend walks down the sidewalk to the right. After 30 seconds, the student calls to her friends to stop and shine their flashlights toward her. She is surprised to observe that one light seems bigger and brighter than the other.

Which claim best explains the student's observation?

- A. The different heights of the two friends affects how bright each flashlight appears.
- B. The direction of the light source affects how bright the flashlight appears.
- C. One friend walked faster and, therefore, traveled a greater distance than the other friend.
- D. The student's eyes are playing tricks on her. Each flashlight **MUST** appear to have the same brightness.

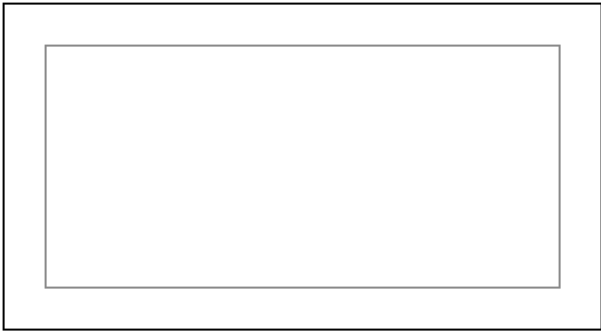
Question 10.

Mary observes three bright stars in the night sky. Star C appears the brightest and Star B appears the least bright, as shown in the diagram.

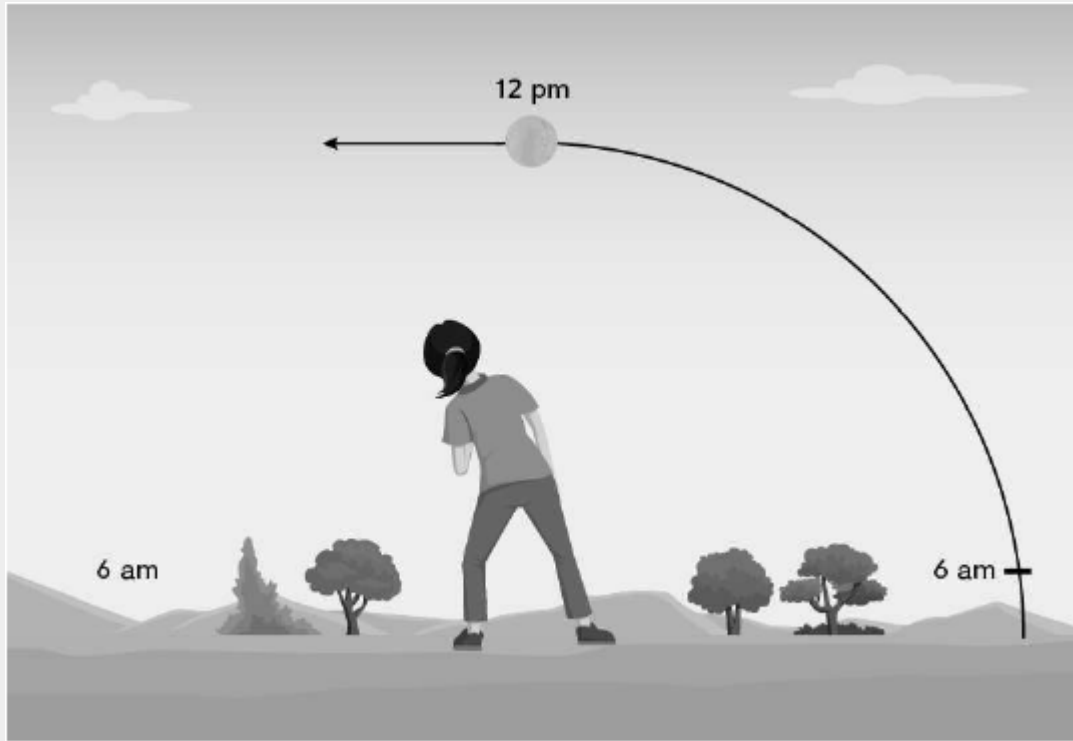


- a. Based on Mary's observation, order the three stars from closest to Earth to farthest from Earth. Explain your reasoning.

- b. Explain why the Sun appears brighter than any star in the night sky.

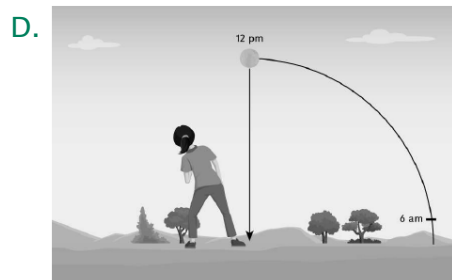
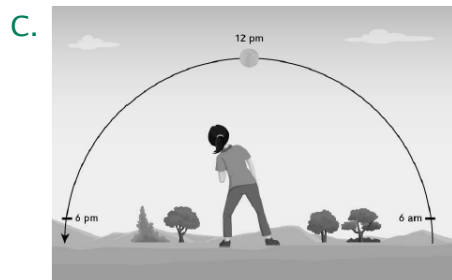
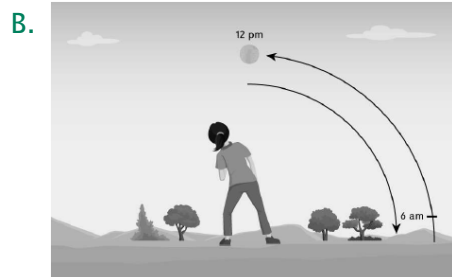
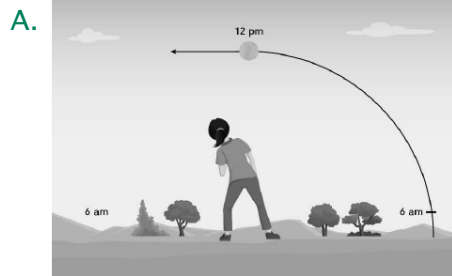


A student stands in exactly the same location facing North at different times throughout the day. She also observes the Sun's position in the sky. She draws the following diagram to show what she observed.



Question 11.

Which graph demonstrates an extension of her results if she continued observing the Sun until it set?



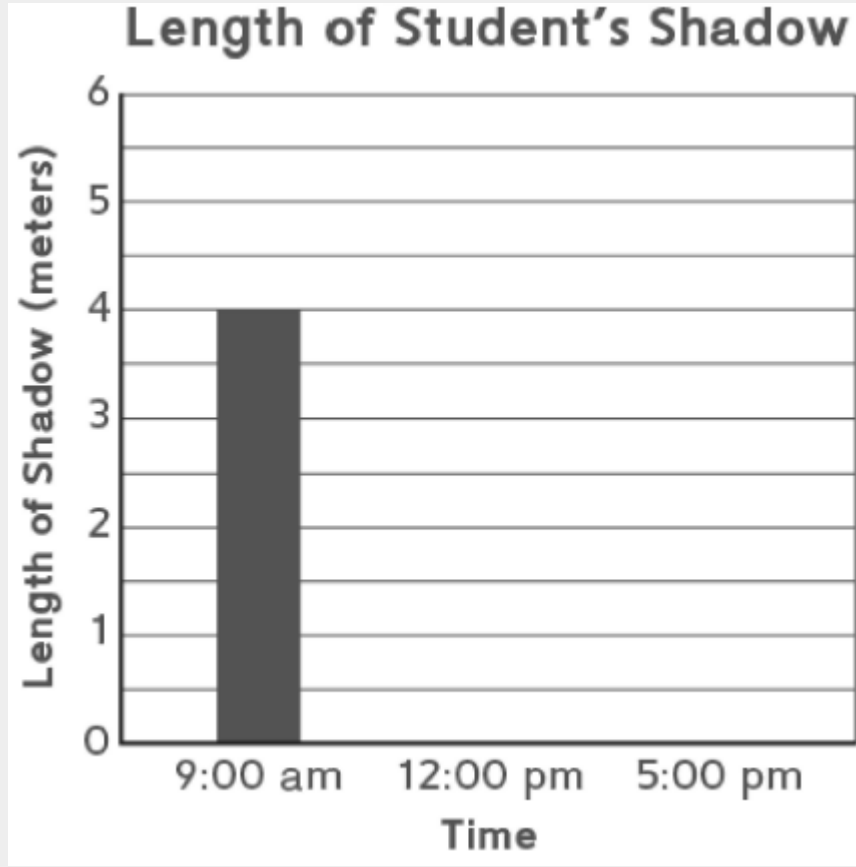
Question 12.

A student recorded the shadow of the same object at 7:00 a.m. and 7:00 p.m. on the same June day in the Northern Hemisphere. How would the shadow cast by an object at 7:00 a.m. compare to a shadow cast by the same object at 7:00 p.m. on the same day?

- A. A shadow cast at 7:00 a.m. will be long and pointing westward, while at 7:00 p.m. it will be long and pointing eastward.
- B. The shadow cast at 7:00 a.m. will be longer than the shadow cast at 7:00 p.m.
- C. The shadow cast at 7:00 p.m. will be longer than the shadow cast at 7:00 a.m.
- D. A shadow cast at 7:00 a.m. will be long and pointing eastward, while there won't be a shadow cast at 7:00 p.m. as it will dark.

Performance Task

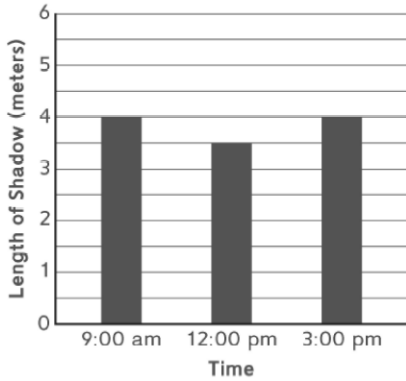
The student decides that he wants to measure the length of his shadow throughout the day and then begins to graph the data.



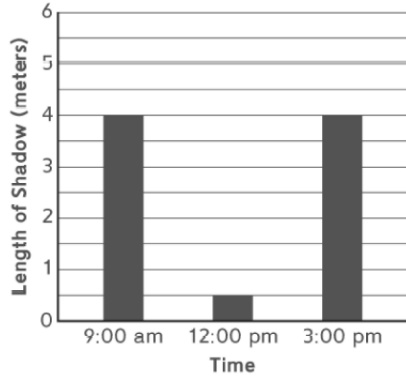
Question 13.

Predict the length of the student's shadow at both 12:00 p.m. and 5:00 p.m. Which graph correctly predicts the length of the student's shadow?

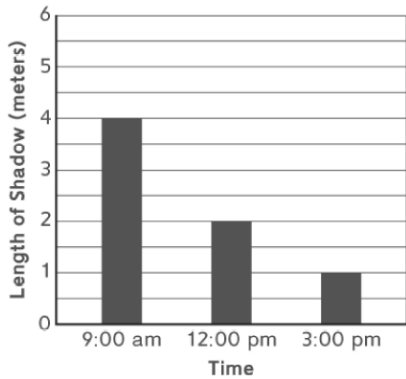
A. Length of Student's Shadow



B. Length of Student's Shadow

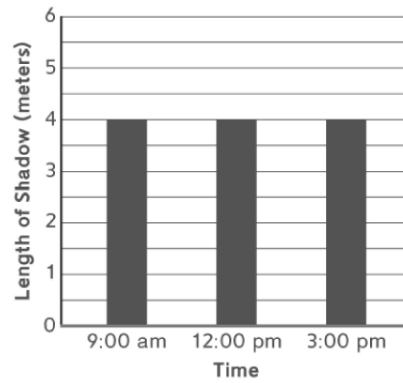


C. Length of Student's Shadow



D.

Length of Student's Shadow



The table outlines the sunrise and sunset times in Halifax, Nova Scotia, Canada, and in San Jose, Costa Rica. Canada and Costa Rica are both in the Northern Hemisphere. Analyze the data to complete the question.

1/1/20 19	7:51 AM	4:44 PM	5:53 AM	5:27 PM
1/2/2 019	7:51 AM	4:45 PM	5:54 AM	5:27 PM
1/3/2 019	7:51 AM	4:46 PM	5:54 AM	5:28 PM
1/4/2 019	7:51 AM	4:47 PM	5:54 AM	5:28 PM
1/5/2 019	7:51 AM	4:48 PM	5:55 AM	5:28 PM

Question 14.

What can you infer about the tilt of Earth in relation to the cities on the table?

- A. The days are shorter in Canada. The North Pole is tilted towards the Sun. It is summer in Canada.
- B. The days are shorter in Canada. The North Pole is tilted away from the Sun. It is winter in Canada.
- C. The days are shorter in Costa Rica. The North Pole is tilted towards the Sun. It is winter in Costa Rica.
- D. The days are longer in Costa Rica. The North Pole and South Pole are tilted away from the Sun. It is neutral in Costa Rica because it is near the Equator.

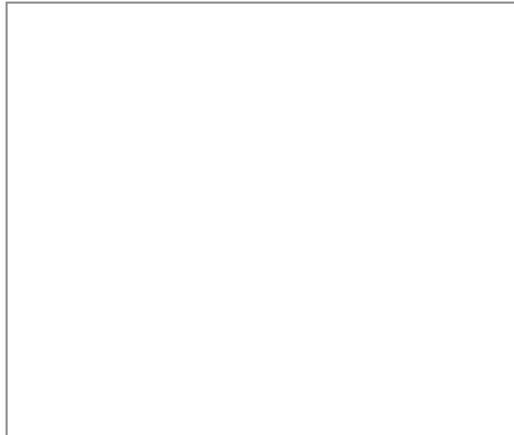
Question 15.

The Pegasus constellation is viewable in the night sky of the Northern Hemisphere at different times of year.

Identify the season in which the Pegasus constellation is easiest for people to observe.



Explain how Earth's orbit around the Sun affects whether the Pegasus constellation is visible.



Question 16.

Kacey used helium to inflate a balloon. Before she used the helium, the balloon was flat and flexible. Afterward, it was not flexible and held its shape. Why did the balloon hold its shape after it was inflated?

- A. Air from the helium changed the balloon into a harder type of rubber.
- B. Air changed into a solid substance inside the balloon and made it hold its shape.
- C. Air particles pushed against the inside of the balloon.
- D. Air particles in the balloon got bigger and filled the space in the balloon.

Question 17.

Which of these is evidence that air is made of particles of matter?

- A. You can see through the atmosphere into space.
- B. On a hot day, the air feels warmer than water in a lake.
- C. When you drop a heavy object in the air, it falls until it hits a hard surface.
- D. When the wind blows, it moves leaves across the ground.