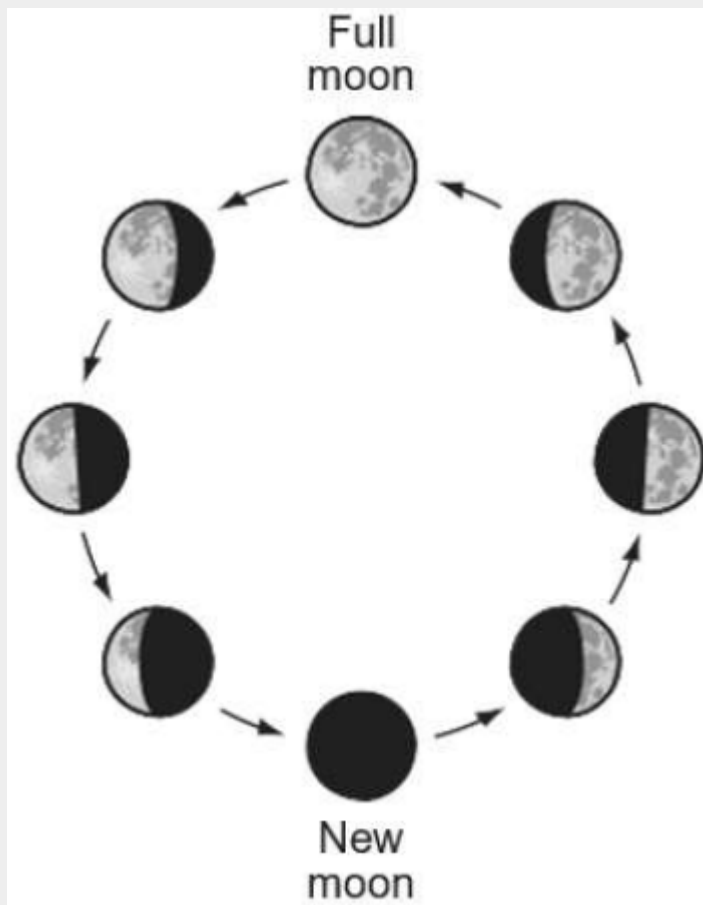


2023–2024 Gr6 Science Benchmark Unit 3

Emma observed the Moon on eight nights during a lunar cycle. A full moon was visible on the first night. The diagram shows Emma's observations.



Question 1.

Which phase of the Moon did Emma most likely observe on the eleventh night of this lunar cycle?

A.



B.



C.



D.



Question 2.

Summer occurs on the hemisphere of Earth that is _____.

A. turned away from the Sun

B. tilted toward the Sun

C. tilted away from the Sun

D. turned toward the Sun

Question 3.

Sally wants to design a model that will show how the Earth–Sun–Moon system causes the Moon’s phases. She has a lamp, a tennis ball, and a cotton ball. Sally decides to set the lit lamp on a table to represent the Sun.

How can Sally use the tennis ball and cotton ball to represent the new moon phase?

- A. She can place the tennis ball, representing Earth, and the cotton ball, representing the Moon, on opposite sides of the lamp.
- B. She can hold the tennis ball, representing the Moon, and the cotton ball, representing Earth, in the same hand and move them in a circle around the lamp.
- C. She can hold the tennis ball, representing Earth, in one hand within the lamp’s light and hold the cotton ball, representing the Moon, in her other hand between the lamp and the tennis ball.
- D. She can hold the tennis ball, representing the Moon, in her right hand and the cotton ball, representing Earth, in her left hand within the lamp’s light. Then she can have someone else turn the

lamp on and off repeatedly.

Question 4.

Why don’t solar eclipses occur every new moon?

- A. The Moon’s orbit around Earth and Earth’s orbit around the Sun are not the same speed, so the three bodies only line up during the full moon.
- B. The Moon’s orbit around Earth and Earth’s orbit around the Sun are not in the same plane, so the three bodies only line up occasionally.
- C. The Moon’s orbit around the Sun and Earth’s orbit around the Sun are not in the same plane, so the three bodies only line up occasionally.
- D. The Moon’s orbit around Earth and the Sun’s orbit around Earth are not in the same plane, so the three bodies only line up occasionally.

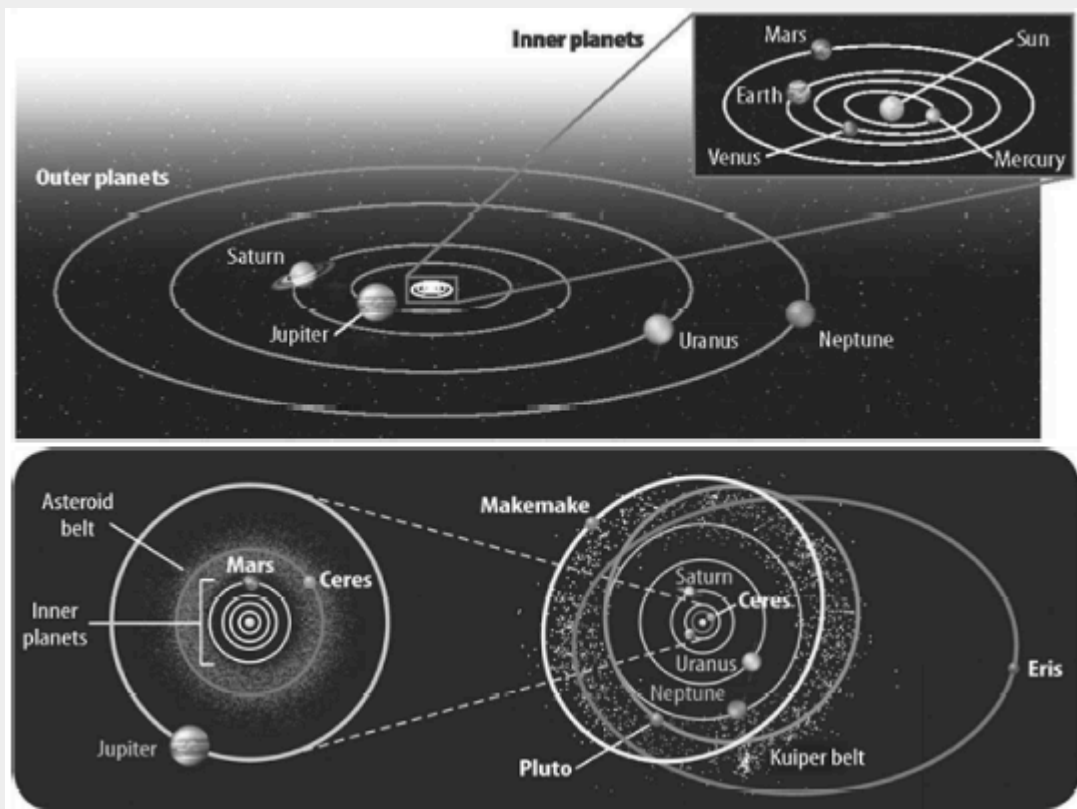
Question 5.

Eclipses occur when the Sun, the Moon, and _____ line up perfectly.

Question 6.

Which statement explains why the objects of the solar system revolve around the sun?

- A. The Sun holds 99% of the mass in the solar system, so it has enormous gravitational pull.
- B. The Sun generates its own energy, so the planets stay close to absorb its heat and light.
- C. Light waves from the Sun cause the planets to revolve around it.
- D. Heat energy from the Sun attracts the planets and keeps them in orbit.



Question 7.

Why did the artists for both of these illustrations feel it necessary to represent the inner planets with a pulled out piece?

- A. Both drawings are needed to show that there are other objects in our solar system.
- B. Both drawings are needed to correctly represent the distances between the planets.
- C. Both drawings are needed to show the placement of the solar system in the Milky Way.
- D. Both drawings are needed to show a more dramatic representation of the shape of the planets' orbits.

Question 8.

Which of the following data can help someone to infer the size of a planet?

- A. how many moons it can capture due to its pull of gravity
- B. how far it is from the Sun in km
- C. its surface temperature in degrees
- D. its surface geography

Question 9.

Spiral, elliptical, and irregular are three types of _____ in the universe.

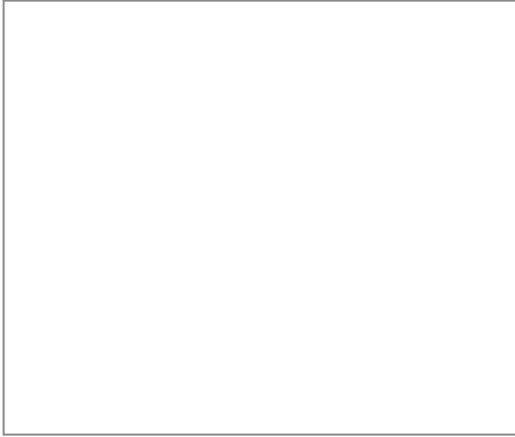
Question 10.

Which correctly describes the gravity between objects in the solar system?

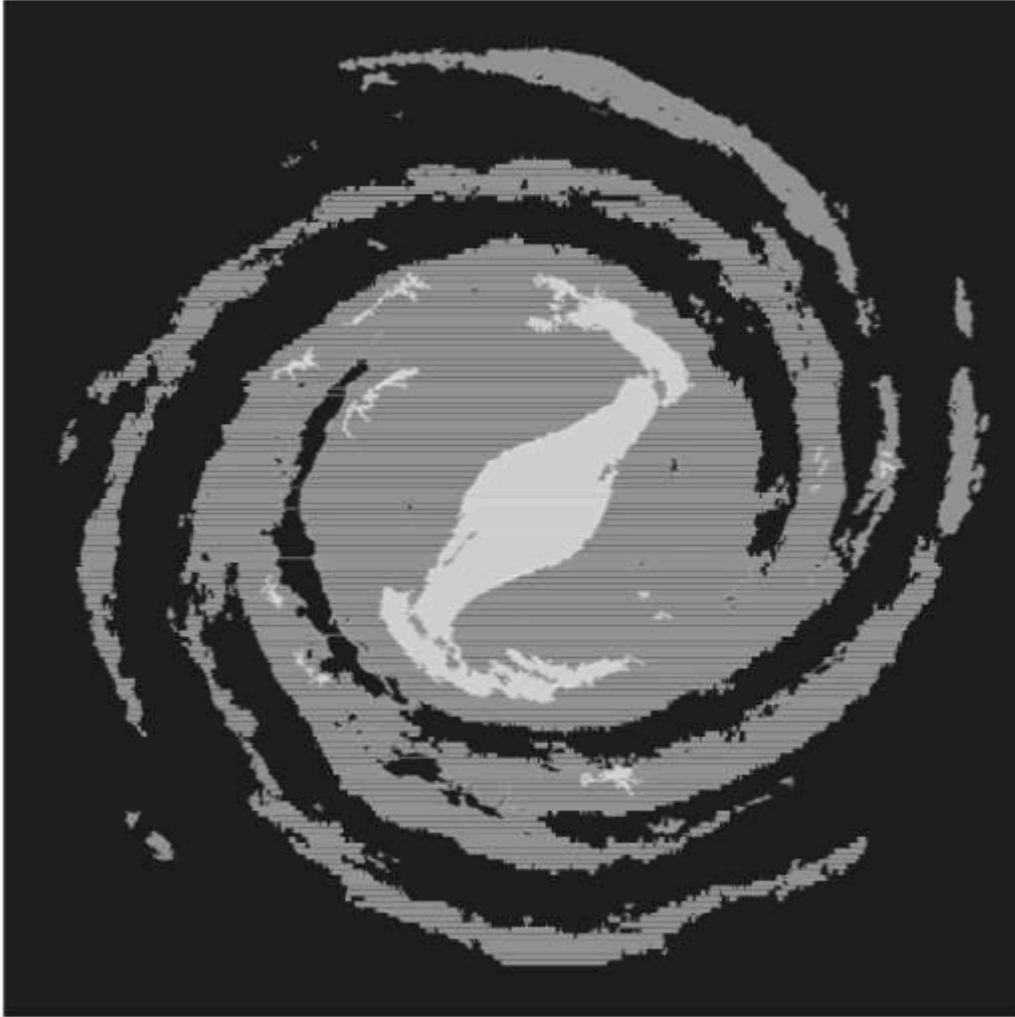
- A. Objects far from the Sun are not large enough to pull on any other objects in the solar system.
- B. Objects in orbit are in motion, and are not affected by gravity.
- C. Objects far apart pull on each other more strongly than objects close together.
- D. Objects with a large mass pull with more force than objects with a small mass.

Question 11.

Explain why the moon orbits Earth,
and not the Sun.



Dan is creating a model of a galaxy. The first part of the model is the drawing shown.

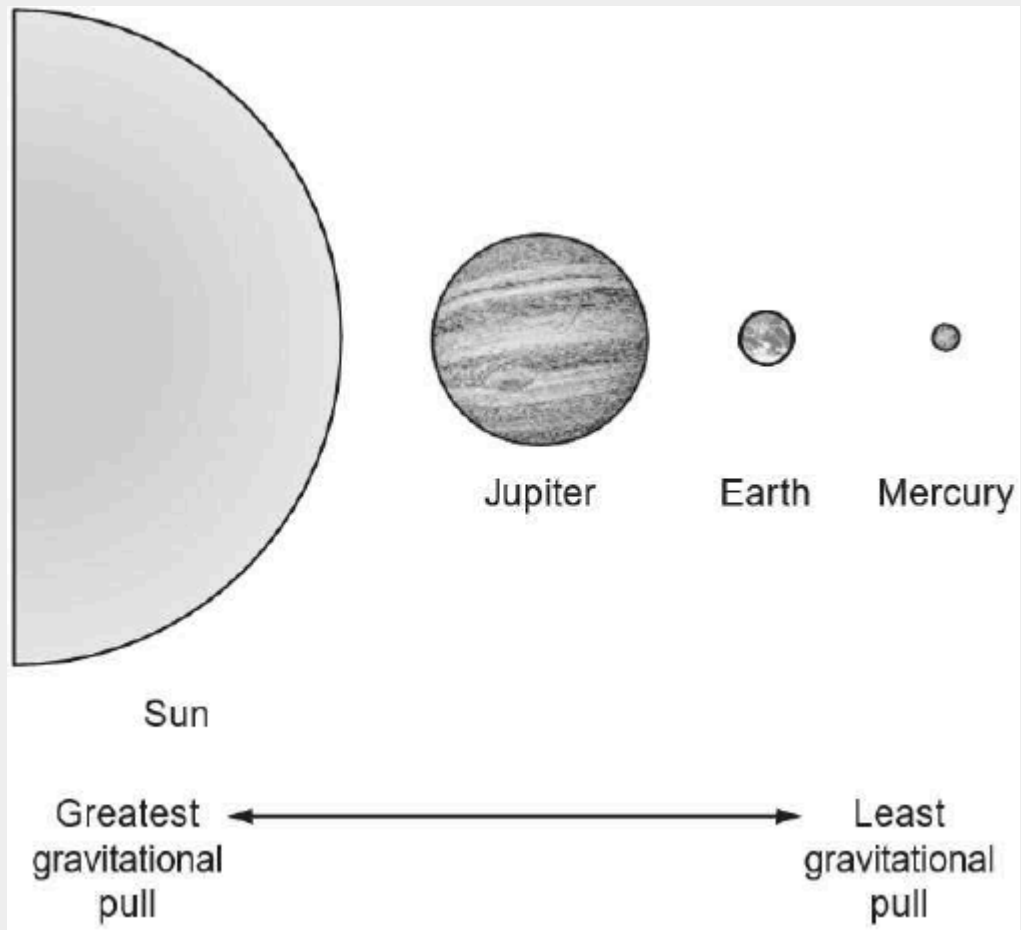


Question 12.

Which additions to Dan's model will correctly show **both** gravitational force and its effect within the galaxy?

- A. a straight arrow pointing outward from the center of the galaxy, and a curved arrow showing rotation of the whole galaxy
- B. a straight arrow pointing inward from one galaxy arm toward the center of the galaxy, and a straight arrow showing the galaxy's path through space
- C. straight arrows pointing outward and inward from the center of the galaxy, and curved arrows showing the rotation of objects around the center of the galaxy
- D. straight arrows pointing inward from outside each of the galaxy's arms, and straight arrows showing the paths of objects moving from within to outside the galaxy

James has created the diagram shown to model three planets in the order of their gravitational force with the Sun.



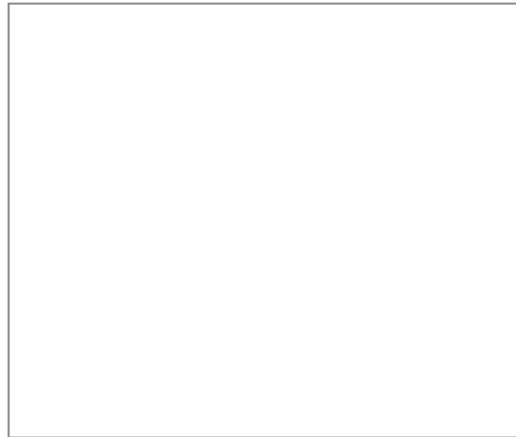
Question 13.

Which change to the model will make it more accurate and why?

- A. reorder the planets to Mercury, Earth, Jupiter, because the Sun pulls more strongly on smaller planets than on larger planets
- B. reorder the planets to Mercury, Earth, Jupiter, because both distance from the Sun and the planets' masses influence gravitational pull
- C. keep the same order but move Earth and Mercury much farther away, because gravitational pull increases as distance from the Sun increases
- D. put all three planets the same distance from the Sun, because the Sun's constant mass causes the same gravitational pull on all three planets

Question 14.

Kaya's class is working together to make an model of the solar system to hang in their classroom. What will the class have to do to correctly represent the distance between objects in the model?



Question 15.

What happens to the parts of food molecules as matter moves through an organism?

- A. The parts of the food molecules disappear.
- B. The parts of food molecules are rearranged to make new molecules or release energy.
- C. The food molecules are broken apart and expelled by the body.
- D. The parts of the food molecules do not change.

Question 16.

Which of the following best describes how food is used for energy in the human body?

- A. Food is broken down into small pieces by our teeth and stomach acid, and then transported to our cells to be used as energy.
- B. Our body absorbs food directly into our bloodstream, which then goes to our muscles to be used as energy.
- C. Food is transformed into new molecules through chemical reactions in our body, which are then used to support growth and release energy.
- D. Our body stores food in our fat cells until we need it for energy.