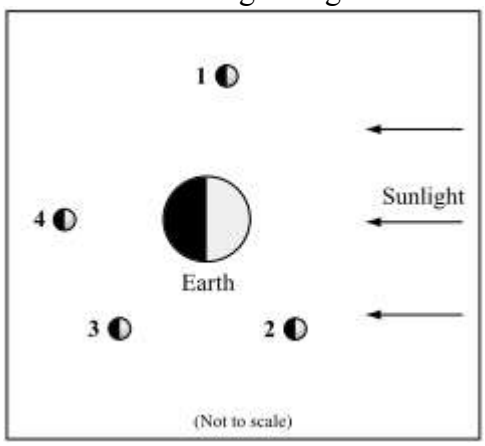
G8 Semester I MCAS Pre-Test

Please answer on Scantron Card; not on this test form

Reporting Category: Earth and Space Science
Standard: 9 - Describe lunar and solar eclipses, the observed moon phases, and tides. Relate them to the relative positions of the earth, moon, and sun.

1. The diagram below shows Earth, four different positions of the Moon, and the direction of incoming sunlight.

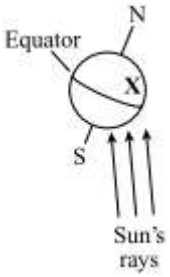


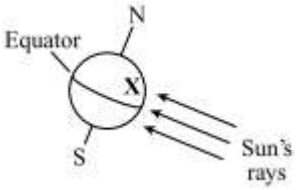
In which position would the Moon appear as a full moon as seen from Earth?

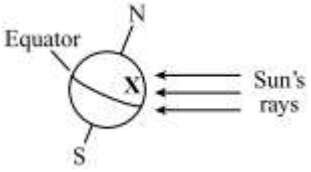
A. position 1
B. position 2
C. position 3
D. position 4

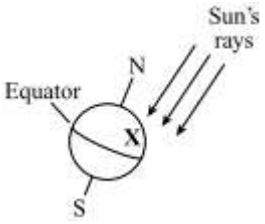
Reporting Category: Earth and Space Science
Standard: 11 - Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons.

2. Which of the following diagrams best represents the angle at which the Sun's rays strike location X at noon on June 21?

A. 

B. 

C. 

D. 

Reporting Category: Earth and Space Science
Standard: 12 - Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars.

3. A student uses the following characteristics to describe a group of objects in space.

- 200 billion stars
- 30 million light years from Earth
- 500 light years in diameter

Which of the following is the student most likely describing?

A. a galaxy

B. the universe

C. a constellation

D. the solar system

Standard: 10 - Compare and contrast properties and conditions of objects in the solar system (i.e., sun, planets, and moons) to those on Earth (i.e., gravitational force, distance from the sun, speed, movement, temperature, and atmospheric conditions).

4. Which of the following has a warmer average surface temperature than Earth?

A. Mars

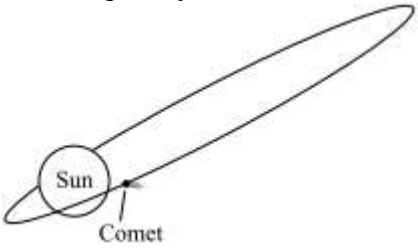
B. Moon

C. Pluto

D. Venus

Reporting Category: Earth and Space Science
Standard: 8 - Recognize that gravity is a force that pulls all things on and near the earth toward the center of the earth. Gravity plays a major role in the formation of the planets, stars, and solar system and in determining their motions.

5. The diagram below shows the orbit of a comet around the Sun. The comet travels more quickly in its orbit when it is closer to the Sun.



Which of the following statements best explains why the comet travels more quickly when it is closer to the Sun?

A. The mass of the comet increases.

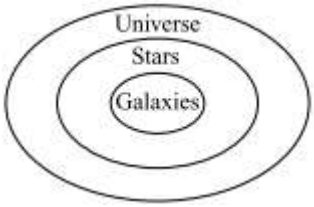
B. The temperature of the comet increases.

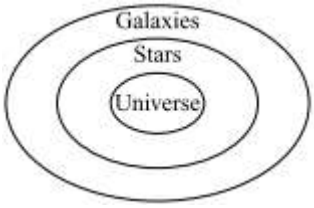
C. The frictional force on the comet increases.

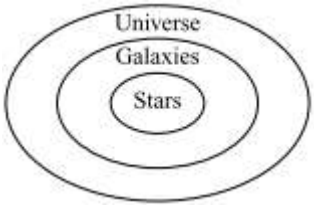
D. The gravitational pull on the comet increases.

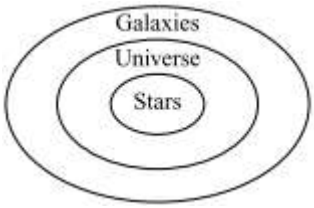
Reporting Category: Earth and Space Science
Standard: 12 - Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars.

6. Which of the following diagrams best represents the size relationships among galaxies, stars, and the universe?

A.


B.


C.


D. 

Reporting Category: Earth and Space Science
Standard: 3 - Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system.

7. Heat energy from the Sun is transferred to Earth primarily by which of the following processes?

A. conduction

B. convection

C. evaporation

D. radiation

Reporting Category: Earth and Space Science
Standard: 10 - Compare and contrast properties and conditions of objects in the solar system (i.e., sun, planets, and moons) to those on Earth (i.e., gravitational force, distance from the sun, speed, movement, temperature, and atmospheric conditions).

8. Which of the following statements best describes how the four planets closest to the Sun are different from the next four planets in our solar system?

A. The four closest planets are more dense.

B. The four closest planets have more moons.

C. The four closest planets have greater diameters.

D. The four closest planets take longer to complete one orbit.

Reporting Category: Earth and Space Science
Standard: 9 - Describe lunar and solar eclipses, the observed moon phases, and tides. Relate them to the relative positions of the earth, moon, and sun.

9. Miriam notices when she goes to the beach that sometimes the water rises as high as the pier. At other times of the day, the water barely covers the pillars under the pier. These differences in water level are primarily due to the gravitational influence of which of the following?

A. the Sun

B. the Moon

C. asteroids

D. comets

Reporting Category: Earth and Space Science
Standard: 11 - Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons.

10. The winter solstice occurs on either December 21 or 22, depending on the year. Which of the following statements best explains why the time of the year the winter solstice occurs has the least amount of daylight in Massachusetts?

A. Earth is farthest away from the Sun on the winter solstice.

B. Earth's rotational speed on its axis is greatest on the winter solstice.

C. Earth is traveling around the Sun with the greatest speed on the winter solstice.

D. Earth's Northern Hemisphere is tilted away from the Sun on the winter solstice.

Reporting Category: Earth and Space Science
Standard: 11 - Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons.

11. The diagram below shows the relative positions of Earth and the Sun at a certain time of year.

Based on the diagram, which season is occurring in the Southern Hemisphere of Earth?

A. winter

B. spring

C. summer

D. fall

Reporting Category: Earth and Space Science
Standard: 12 - Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars.

12. Which of the following correctly lists the structures in space from smallest to largest?

A. star, galaxy, solar system, universe

B. star, solar system, galaxy, universe

C. star, solar system, universe, galaxy

D. star, universe, solar system, galaxy

Reporting Category: Earth and Space Science
Standard: 10 - Compare and contrast properties and conditions of objects in the solar system (i.e., sun, planets, and moons) to those on Earth (i.e., gravitational force, distance from the sun, speed, movement, temperature, and atmospheric conditions).

13. Which of the following planets is always closer to the Sun than it is to Earth?

A. Jupiter

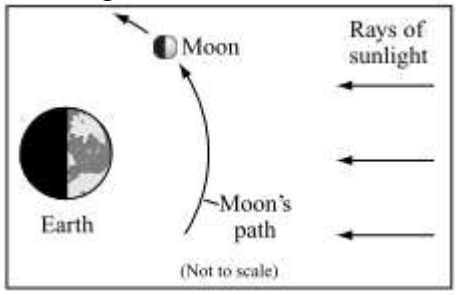
B. Mercury

C. Saturn

D. Uranus

Reporting Category: Earth and Space Science
Standard: 9 - Describe lunar and solar eclipses, the observed moon phases, and tides. Relate them to the relative positions of the earth, moon, and sun.

The diagram below shows the relative positions of Earth and the Moon and rays of sunlight.



14. Based on the diagram, which of the following best represents how the Moon would appear as seen from Earth?

A. 

B. 

C. 

D. 

Reporting Category: Earth and Space Science
Standard: 11 - Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons.

15. Which of the following statements best explains why it is warmer at the equator than at the North Pole?

A. The equator has a larger area than the North Pole.

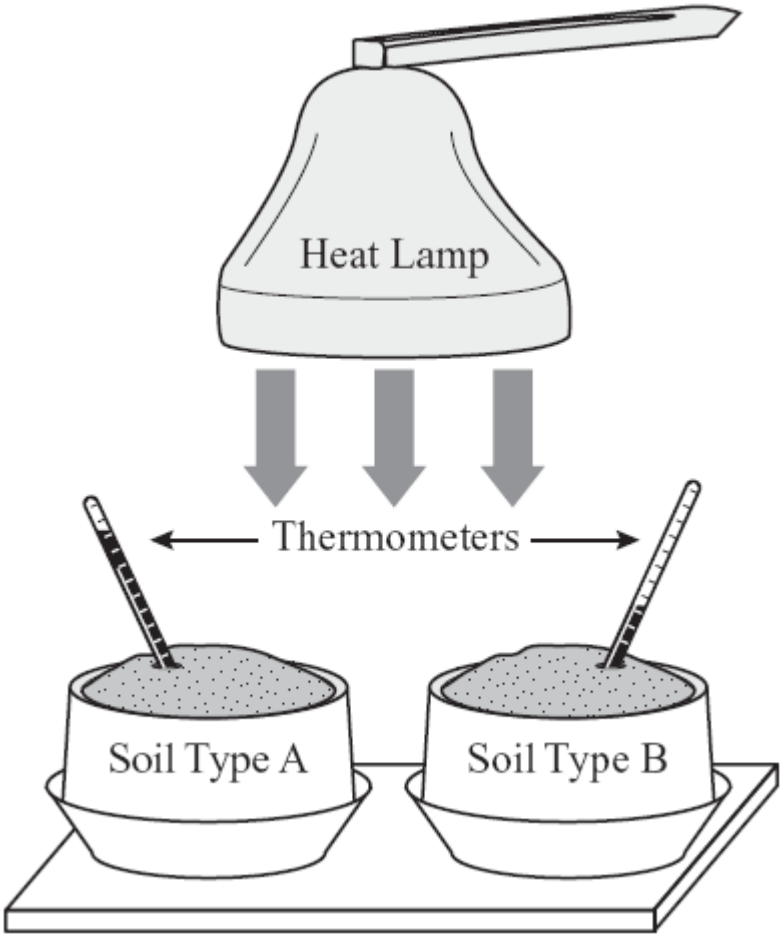
B. The equator is closer to the Sun than the North Pole.

C. The equator receives more direct sunlight than the North Pole.

D. The equator has more hours of daylight per year than the North Pole.

Reporting Category: Earth and Space Science
Standard: 3 - Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system.

The diagram below represents an experiment on different types of soil.



16. The thermometers are measuring the temperature of the center of the soil samples. Which of the following is a cause of the measured difference in the temperature of the two soils?

A. conduction within different soil types

B. condensation within different soil types

C. radiation emitted by different soil types

D. convection in the air above different soil types

Reporting Category: Earth and Space Science
Standard: 8 - Recognize that gravity is a force that pulls all things on and near the earth toward the center of the earth. Gravity plays a major role in the formation of the planets, stars, and solar system and in determining their motions.

17. Which of the following causes a ship's iron anchor to sink to the ocean floor when it is released overboard?

A. chemical forces
B. gravity
C. magnetism
D. nuclear forces

Reporting Category: Earth and Space Science
Standard: 12 - Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars.

18. Which of the following is the best estimate of the number of stars in a typical galaxy?

A. tens
B. hundreds
C. thousands
D. billions

Reporting Category: Earth and Space Science
Standard: 11 - Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons.

19. Which of the following statements best explains why the tilt of Earth on its axis causes summer to be warmer than winter in the Northern Hemisphere?

A. The warm ocean currents flow from the tropics to the Northern Hemisphere in the summer.

B. The rays of the Sun strike the Northern Hemisphere more directly in the summer.

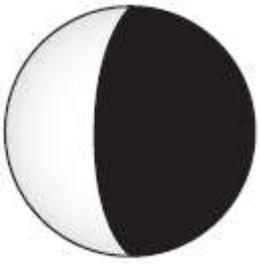
C. The greenhouse effect increases in the Northern Hemisphere in the summer.

D. The Northern Hemisphere is closer to the Sun in the summer.

Reporting Category: Earth and Space Science
Standard: 9 - Describe lunar and solar eclipses, the observed moon phases, and tides. Relate them to the relative positions of the earth, moon, and sun.

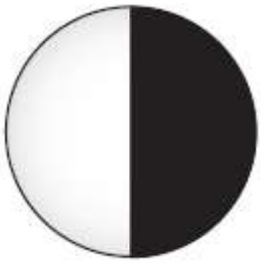
20. Which of the following pictures shows the appearance of the Moon when a solar eclipse occurs?

A.

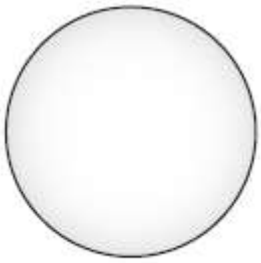


Waning Moon

B.



Quarter Moon

C. 

Full Moon

D. 

New Moon

Reporting Category: Earth and Space Science
Standard: 10 - Compare and contrast properties and conditions of objects in the solar system (i.e., sun, planets, and moons) to those on Earth (i.e., gravitational force, distance from the sun, speed, movement, temperature, and atmospheric conditions).

21. Which of the following statements best describes one way that the Moon is different from Earth?

A. The Moon is not solid.

B. The Moon has no gravity.

C. The Moon has almost no atmosphere.

D. The Moon receives almost no solar light.

Reporting Category: Earth and Space Science
Standard: 7 - Explain and give examples of how physical evidence, such as fossils and surface features of glaciation, supports theories that the earth has evolved over geologic time.

Reporting Category: Earth and Space Science
Standard: 4 - Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land, and atmosphere.

22. What is the primary energy source that drives all weather events, including precipitation, hurricanes, and tornados?

A. the Sun
B. the Moon
C. Earth's gravity
D. Earth's rotation

Reporting Category: Earth and Space Science
Standard: 8 - Recognize that gravity is a force that pulls all things on and near the earth toward the center of the earth. Gravity plays a major role in the formation of the planets, stars, and solar system and in determining their motions.

23. Which of the following keeps the planets in our solar system in orbit around the Sun?

A. atmospheric pressure
B. gravitational force
C. electromagnetic energy
D. thermal energy

Reporting Category: Earth and Space Science
Standard: 3 - Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system.

24. Heat from deep in Earth's interior is transferred to its crust by which of the following?

A. conduction in the ocean
B. convection in the mantle
C. radiation from the solid core
D. evaporation at mid-ocean ridges

Reporting Category: Earth and Space Science
Standard: 4 - Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land, and atmosphere.

25. The ocean water near the equator absorbs more heat throughout the year than ocean water near the North Pole. Which of the following best explains this difference?

A. The equator is closer to the Sun.
B. The equator has higher sea levels.
C. The equator receives more direct sunlight.
D. The equator rotates more quickly on Earth's axis.

Reporting Category: Earth and Space Science
Standard: 12 - Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars.

26. Which of the following lists is in order from smallest to largest?

A. universe → solar system → galaxy

B. galaxy → solar system → universe

C. solar system → universe → galaxy

D. solar system → galaxy → universe

Reporting Category: Earth and Space Science
Standard: 6 - Describe and give examples of ways in which the earth's surface is built up and torn down by natural processes, including deposition of sediments, rock formation, erosion, and weathering.

27. Which of the following areas is most likely to form metamorphic rocks such as gneiss and schist?

A. a sea floor

B. a windblown desert

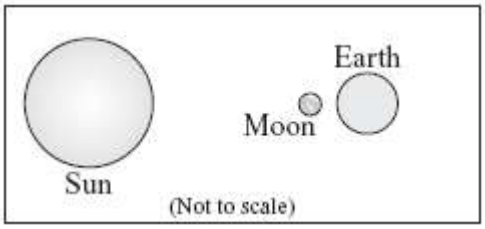
C. a site deep underground

D. a site covered by a glacier

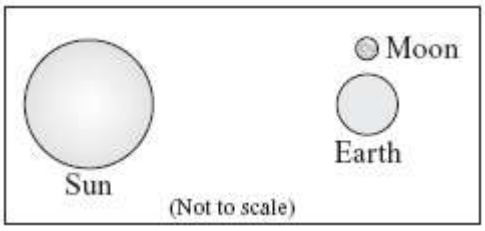
Reporting Category: Earth and Space Science
Standard: 9 - Describe lunar and solar eclipses, the observed moon phases, and tides. Relate them to the relative positions of the earth, moon, and sun.

28. Which of the following diagrams best shows the relative positions of Earth, the Moon, and the Sun during a lunar eclipse?

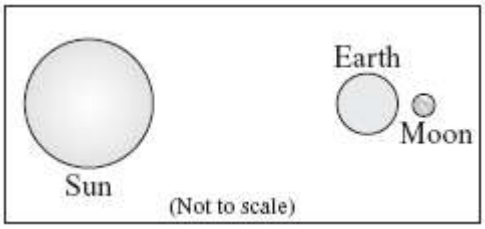
A.



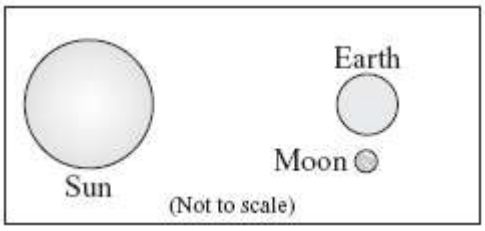
B.



C.



D.



Reporting Category: Earth and Space Science
Standard: 4 - Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land, and atmosphere.

29. Which of the following is the main reason water at the surface of the ocean is warmer than water at the bottom of the ocean?

A. Water at the bottom of the ocean contains more dissolved solids.

B. Water at the surface of the ocean absorbs more energy from the Sun.

C. Friction is created by fast moving currents at the surface of the ocean.

D. Wave action transfers heat from the bottom of the ocean to the surface.

Standard: 1 - Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object.

The table below shows the mass and the weight of a certain object on Earth.

Mass (kg)	Weight (N)
6.0	60

30. The force of gravity on the Moon is about one-sixth the force of gravity on Earth. What are the approximate mass and approximate weight of the same object on the Moon?

A.

Mass (kg)	Weight (N)
1.0	10

B.

Mass (kg)	Weight (N)
6.0	10

C.

Mass (kg)	Weight (N)
6.0	360

D.

Mass (kg)	Weight (N)
36.0	360

Standard: 3 - Recognize that the measurement of volume and mass requires understanding of the sensitivity of measurement tools (e.g., rulers, graduated cylinders, balances) and knowledge and appropriate use of significant digits.

31. Which of the following tools would give the most precise measurement of 15 milliliters of water?

A. a 50 mL beaker

B. a 50 mL graduated cylinder

C. a 500 mL beaker

D. a 500 mL graduated cylinder

Standard: 14 - Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.

32. When a person's sweat evaporates, the person feels cooler. Which of the following statements best describes why sweating helps the person feel cool?

A. Heat is absorbed by sweat when it evaporates.

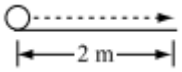
B. Heat is absorbed by the body when sweat evaporates.

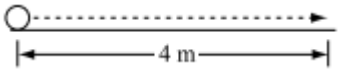
C. The temperature of the water in sweat goes down when it evaporates.

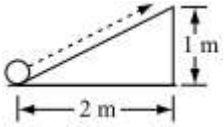
D. The temperature of the water in the body goes up when sweat evaporates.

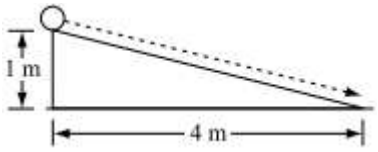
Standard: 13 - Differentiate between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.

33. A ball will be rolled four times. In which of the following situations will some of the kinetic energy of the ball be converted into potential energy as the ball rolls?

A. 

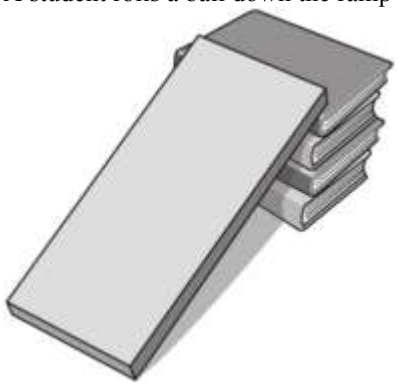
B. 

C. 

D. 

Standard: 11 - Explain and give examples of how the motion of an object can be described by its position, direction of motion, and speed.

A student rolls a ball down the ramp shown in the picture below. The ramp is supported by four stacked books.



34. The student removes two books from the stack supporting the ramp and rolls the ball down the ramp again. Which of the following statements best describes how the ball's motion is different after the books are removed?

A. The ball accelerates more quickly down the ramp.

B. The ball has a higher speed at the top of the ramp.

C. The ball takes more time to reach the bottom of the ramp.

D. The ball has a higher average speed when it rolls off the ramp.

Standard: 10 - Differentiate between physical changes and chemical changes.

The picture below shows a beaker containing a clear liquid with a temperature of 20°C.

20°C, clear

35. A blue powder is added to the liquid. Which of the following pictures provides the best evidence that the change to the liquid is physical, not chemical?

A. 

20°C, blue

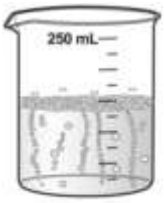
B.

35°C, clear

C.

5°C, blue

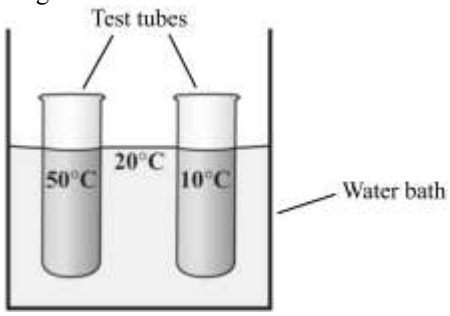
D.



20°C, clear

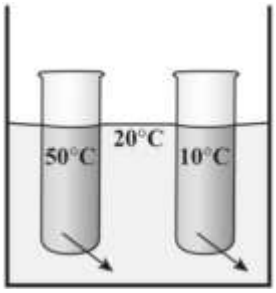
Standard: 16 - Give examples of how heat moves in predictable ways, moving from warmer objects to cooler ones until they reach equilibrium.

A teacher put one test tube of 50°C liquid and one test tube of 10°C liquid into a 20°C water bath, as shown in the diagram below.

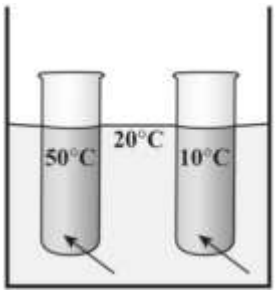


36. Which of the following diagrams best represents the directions that heat will move when the test tubes are placed into the water bath?

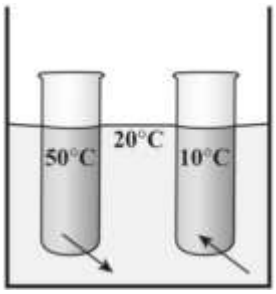
A.



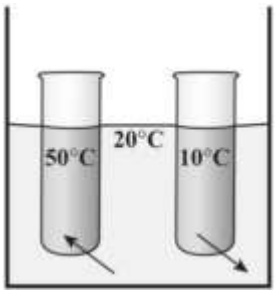
B.



C.



D.



Standard: 2 - Differentiate between volume and mass. Define density.

37. Which of the following units best represents the density of an object?

A. kg

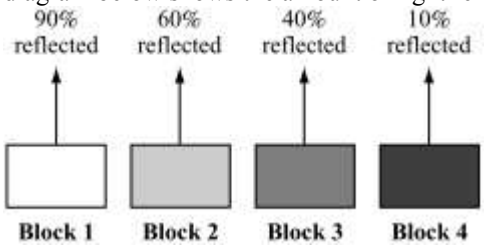
B. hr

C. m/s2

D. g/cm3

Standard: 14 - Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.

Four different-colored blocks are placed outside in bright sunlight. The blocks are identical except for color. The diagram below shows the amount of light reflected from each block.



38. Which block will increase in temperature most rapidly?

A. block 1

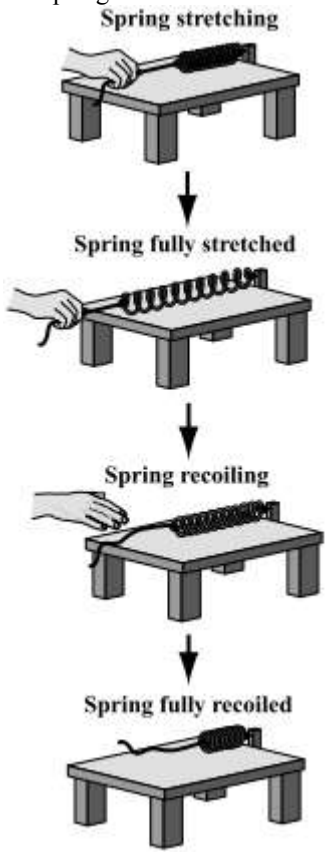
B. block 2

C. block 3

D. block 4

Standard: 13 - Differentiate between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.

A student is investigating potential and kinetic energy by stretching a spring across a table. When the student lets go, the spring recoils.



39. At which time is potential energy in the spring being converted into kinetic energy in this system?

A. when the spring is stretching

B. when the spring is fully stretched

C. when the spring is recoiling

D. when the spring is fully recoiled

Standard: 1 - Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object.

40. If a solid object is taken from Earth far into space, which of the following measurements of the object will change most?

A. density

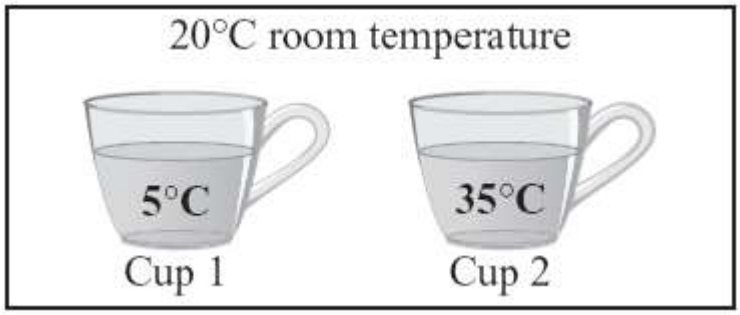
B. mass

C. volume

D. weight

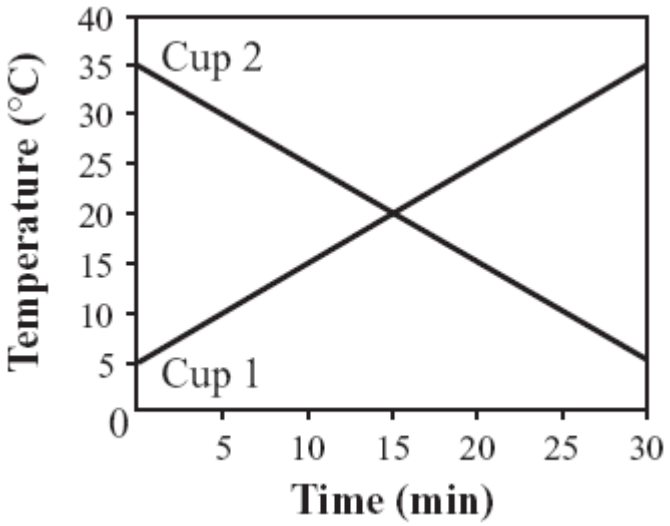
Standard: 16 - Give examples of how heat moves in predictable ways, moving from warmer objects to cooler ones until they reach equilibrium.

During an investigation, Steven filled two cups with the same amount of water and placed them in a 20°C room for 30 minutes. Cup 1 was filled with 5°C water. Cup 2 was filled with 35°C water. The diagram below shows the temperatures of the cups at the beginning of the investigation.

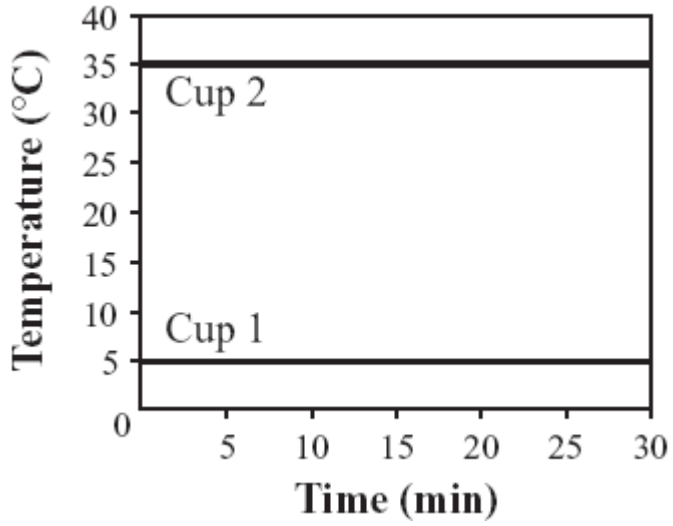


41. Which of the following graphs shows how the temperatures of the two cups of water most likely changed over 30 minutes?

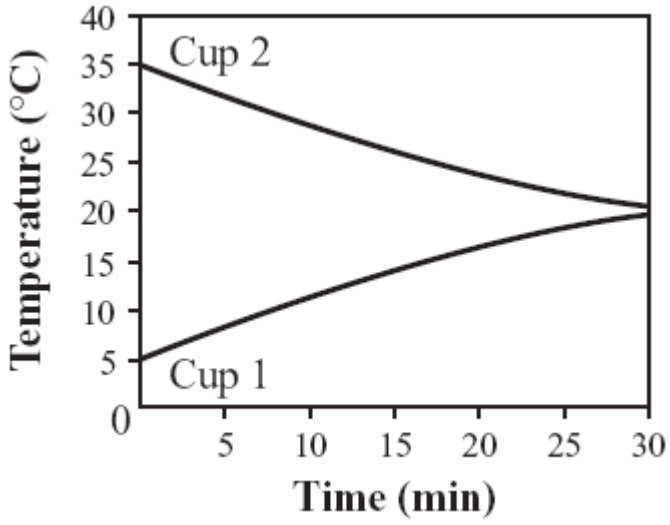
A.


Temperature (°C)
40
35
30
25
20
15
10
5
0
Cup 2
Cup 1
5
10
15
20
25
30
Time (min)

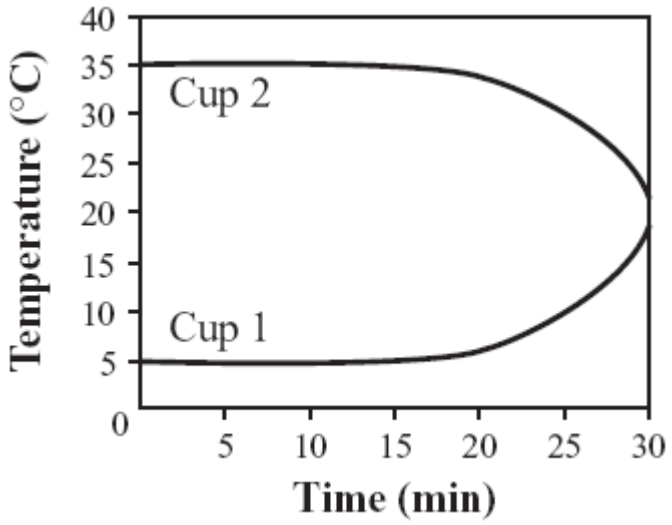
B.


Temperature (°C)
40
35
30
25
20
15
10
5
0
Cup 2
Cup 1
5
10
15
20
25
30
Time (min)

C.

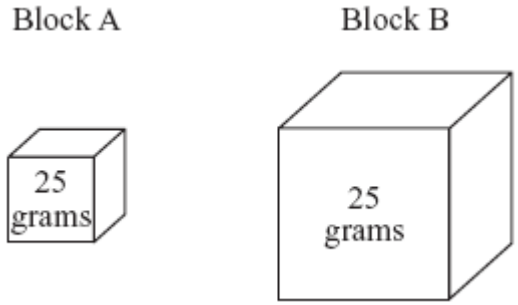

Temperature (°C)
40
35
30
25
20
15
10
5
0
Cup 2
Cup 1
5
10
15
20
25
30
Time (min)

D.



Standard: 1 - Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object.

The diagrams below illustrate two blocks composed of different materials.



42. If Block A is located on the Moon and Block B is located on Earth, what property do these two blocks have in common?

A. They have the same mass.

B. They have the same weight.

C. They have the same volume.

D. They have the same surface area.

Standard: 3 - Recognize that the measurement of volume and mass requires understanding of the sensitivity of measurement tools (e.g., rulers, graduated cylinders, balances) and knowledge and appropriate use of significant digits.

43. New carpet is being measured for a room that is 5.5 m by 4.6 m. On a measuring tape, what is the smallest unit that is necessary to measure the room accurately for the carpet?

A. millimeters
B. centimeters
C. meters
D. kilometers

Standard: 16 - Give examples of how heat moves in predictable ways, moving from warmer objects to cooler ones until they reach equilibrium.

The surface of a heated metal object measures 120°C. It is dropped into a bucket filled with water measuring 10°C.

44. Which of the following is most likely to occur?

A. Both the water and metal will adjust to the same temperature below 10°C.
B. The water and metal will adjust to different temperatures above 120°C.
C. The water will remain the same temperature, but the metal will cool to 10°C.
D. The water and metal will adjust to the same temperature between 10°C and 120°C.

Standard: 14 - Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.

45. A pot of cold water was heated on a stove until the water boiled. Which of the following best explains why the water was able to boil?

A. The hot stove absorbed cold from the pot.

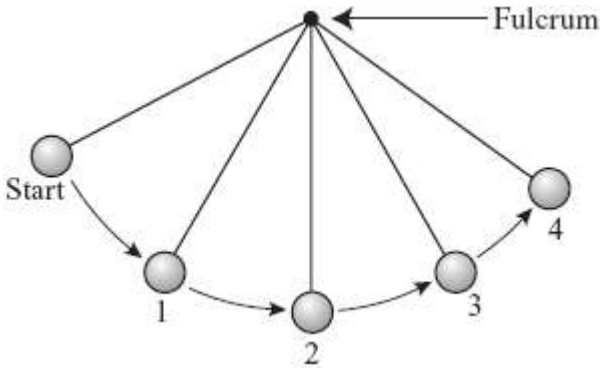
B. The cold water absorbed heat from the pot.

C. The hot stove gave off heat to the surrounding air.

D. The cold water gave off cold to the surrounding air.

Standard: 13 - Differentiate between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.

The diagram below shows some positions in the path of a pendulum swinging from a fixed point called a fulcrum.



46. The pendulum is raised to the start position and released. At which two numbered positions is the potential energy of the pendulum most likely the same?

A. position 1 and position 3

B. position 1 and position 4

C. position 2 and position 3

D. position 2 and position 4