

Energy (Unit-Energy)

Name: _____

Date: _____

1. On a hot day, Jenny walked home from the grocery store with a bag of chocolate chips. When she arrived home the chocolate chips had melted in the bag.

Why did the chocolate chips melt?

- A. Heat transferred from the chocolate chips to the bag.
- B. Heat evaporated from the bag to the chocolate chips.
- C. Heat transferred from the environment to the chocolate chips.
- D. Heat condensed from her hand to the chocolate chips.

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2. Energy appears in many forms. What form of energy is lightning?

- A. electrical energy
- B. mechanical energy
- C. magnetic energy
- D. sound energy

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3. Beaker X contains 100 milliliters of water and Beaker Y contains 250 milliliters of water. Each beaker is heated on a hot plate at the same medium heat setting for five minutes. Which is the **best** prediction of the water temperature in the beakers?

- A. Beaker X will have the highest temperature.
- B. Beaker Y will have the highest temperature.
- C. Beaker X and Beaker Y will have the same temperature.
- D. Beaker Y will have a temperature of 150°F.

4. Two jars are placed inside an insulated box. One jar contains ice water and the other contains hot soup. What will happen to the two liquids?

- A. Both the hot soup and the ice water will gain heat.
- B. Both the hot soup and the ice water will lose heat.
- C. The hot soup will gain heat and the ice water will lose heat.
- D. The hot soup will lose heat and the ice water will gain heat.

5. A glass of water kept at room temperature long enough will become empty because

- A. water molecules slowly leak through the walls of the glass.
- B. water molecules move into the air as gas molecules.
- C. water left in a glass starts to boil and becomes a gas.
- D. water slowly combines with oxygen to become carbon dioxide.

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6. The bulb of a thermometer is placed in your mouth. Which of the following explains why the level of the liquid rises in the thermometer?

- A. Hot air rises inside the thermometer.
 - B. Heat energy changes into light energy.
 - C. The liquid expands when heated.
 - D. Heat can change a solid into a liquid.
-

7. Water that flows from behind a large dam can cause machines to produce electricity. What change takes place?

- A. Heat energy changes into mechanical energy.
 - B. Sound energy changes into electrical energy.
 - C. Chemical energy is used to produce electrical energy.
 - D. Mechanical energy is used to produce electrical energy.
-

8. Suppose you had four spoons the same size and shape made out of glass, plastic, steel, and wood. Which spoon handle would get hot the quickest when the spoons are placed in a pan of hot water?

- A. the glass spoon
 - B. the plastic spoon
 - C. the steel spoon
 - D. the wooden spoon
-

9. When water boils in a pan on a hot burner, heat gets to the water mainly by

- A. conduction of heat through the pan.
 - B. radiation of heat through the pan.
 - C. reflection of heat from the burner.
 - D. absorption of heat from the air in the room.
-

10. When ice cream is left out of the freezer on a table for a long time, it melts. This change in state is caused by the

- A. ice cream absorbing heat.
 - B. ice cream giving up heat.
 - C. air absorbing heat.
 - D. table absorbing heat.
-

11. Through which of the following materials does heat travel the fastest?

- A. glass
 - B. metal
 - C. plastic
 - D. wood
-

12. Which of the following **best** explains why the end of a spoon sticking out of a cup of hot water also gets hot?

- A. The hot water causes a chemical reaction to take place in the spoon.
 - B. The heat from the hot water is conducted to the spoon handle.
 - C. The hot water heats the air surrounding the upper part of the spoon.
 - D. The hot water causes a physical change in the spoon handle.
-

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13. Which of these is **not** a form of energy?

- A. electrical
 - B. light
 - C. heat
 - D. friction
-

14. The distance between a wave's crest and its trough is known as its

- A. low tide measurement.
 - B. water depth.
 - C. wave height.
 - D. wave length.
-

15. Which of the following is an example of kinetic energy?

- A. a child jumping rope
 - B. a swimmer ready to dive
 - C. a stuffed toy lying on a table
 - D. firewood stacked in a fireplace
-

16. People in many places in California produce their electricity from wind energy. Which must be true about the winds in these places in California?

- A. The winds are cold.
 - B. The winds blow very little.
 - C. The winds blow most of the time.
 - D. The winds blow mostly in the morning.
-

17. Light is an example of which type of energy?

- A. nuclear
 - B. gravitational
 - C. electromagnetic
 - D. chemical
-

18. Which represents kinetic energy?

- A. a bear standing in a field of berries
 - B. a salmon resting in still water
 - C. a bear holding a salmon it has caught
 - D. a salmon leaping up a waterfall
-

19. A block of ice on a glass plate is put on a metal shelf in a freezer. Which could cause the ice to change to liquid water?

- A. putting a fan that blows on the ice inside the closed freezer
 - B. raising the temperature inside the freezer
 - C. wrapping a blanket around the ice inside the freezer
 - D. putting the ice directly on the metal shelf inside the freezer
-

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20. When electrical energy is "used" by an electric light, what really happens to the energy?

- A. It is given off as other forms of energy.
 - B. It changes to matter.
 - C. It stops at the electric light.
 - D. It disappears.
-

21. Juan thinks that water will evaporate faster in a warm place than in a cool one. He has two identical bowls and a bucket of water. He wants to do an experiment to find out if he is correct. Which one of the following should he do?

- A. Place a bowl of water in a cool place and a bowl holding the same amount of water in a warm place.
 - B. Place two bowls holding the same amount of water in a warm place.
 - C. Place a bowl of water in a cool place and a bowl holding twice as much water in a warm place.
 - D. Place a bowl of water in a cool place and a bowl holding half as much water in a warm place.
-

22. In which state of matter are molecules in contact with each other but free to move around?

- A. solid
 - B. liquid
 - C. gas
 - D. plasma
-

23. A car stopped at the top of a ramp has

- A. heat energy.
 - B. potential energy.
 - C. kinetic energy.
 - D. mechanical energy.
-

24. In an amusement park a moving bumper car (car 1) collides with a bumper car at rest (car 2) and, after the collision, both cars move. If momentum is conserved, which statement is correct?

- A. The momentum of car 1 increases and the momentum of car 2 decreases.
 - B. The momentum of car 1 decreases and the momentum of car 2 increases.
 - C. The total momentum of both cars increases.
 - D. The total momentum of both cars decreases.
-

25. To pull up a bucket of water from a well, George pulled hard on a handle to wind up a rope. Which kind of energy was George applying to the handle?

- A. chemical energy
 - B. frictional energy
 - C. potential energy
 - D. mechanical energy
-

26. What is the process by which heat energy gets to Earth from the Sun?

- A. conduction
 - B. radiation
 - C. subduction
 - D. convection
-

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27. Patti used a steel wrench to work on her bicycle on a hot, sunny day. She left the wrench on the hot concrete surface for an hour while she had lunch. When she returned, the wrench was very hot to touch. What is the BEST explanation for how the wrench got so hot?

- A. Heat transferred from the concrete to the wrench.
 - B. Heat transferred from the wrench to the air.
 - C. Heat transferred from the bicycle to the wrench.
 - D. Heat transferred from the wrench to the concrete.
-

28. Josie sees lightning off in the distance. A few seconds later she hears thunder. What can Josie conclude?

- A. Sound waves do not travel long distances.
 - B. Light waves travel faster than sound waves.
 - C. Sound waves are weaker than light waves.
 - D. Light waves last longer than sound waves.
-

29. Mariam's mother had an ultrasound to see the baby growing inside of her. Which statement explains how ultrasound works?

- A. A special cream is heated and placed on her mother's stomach area, which produces an image on a computer.
 - B. A fluorescent light is used to transmit light waves into her mother's body, which produce an image on a computer.
 - C. Sound waves are sent into her mother's body, which reflect off of the baby and produce an image on a computer.
 - D. A type of medicine is injected into her mother, which causes an image of the baby to be produced on a computer.
-

30. The students saw the safety symbol below on the chemistry lab page that described the experiment they were about to do.



What does this experiment use that poses a potential danger of which they should be aware?

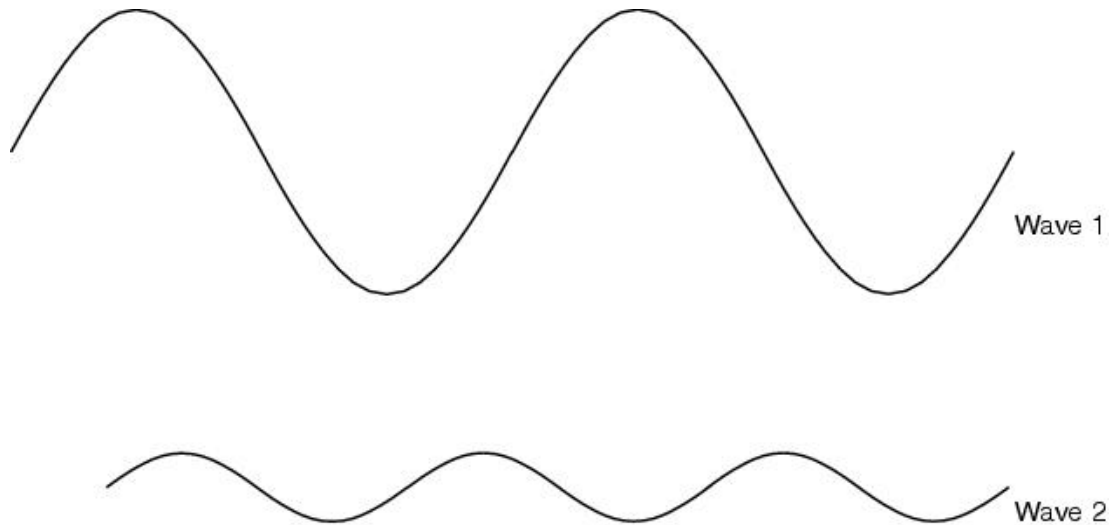
- A. fire
 - B. electricity
 - C. poisonous chemicals
 - D. sharp objects
-

31. Which situation is an example of increasing potential energy?

- A. pulling a wagon uphill
 - B. emptying a bucket of water
 - C. a cat jumping from a tree
 - D. a bicyclist stopping at a stop sign
-

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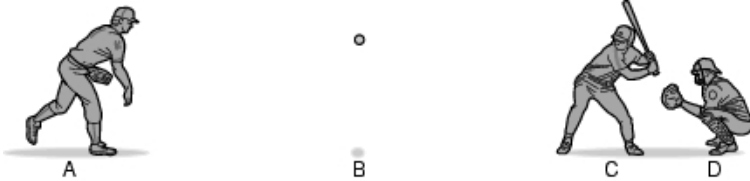
32. Waves 1 and 2 show two different sound waves. Look carefully at the two waves.



In what ways do their wave characteristics differ?

- A. Wave 1 has a longer wavelength and lower amplitude than wave 2.
 - B. Wave 1 has a shorter wavelength and higher amplitude than wave 2.
 - C. Wave 1 has a longer wavelength and a higher amplitude than wave 2.
 - D. Wave 1 has a shorter wavelength and a lower amplitude than wave 2.
-

33. A pitcher throws a baseball as shown in the diagram below.



Which of these has MOSTLY kinetic energy?

- A. the pitcher
 - B. the ball
 - C. the batter
 - D. the catcher
-

34.

How do microwaves cook food?

- A. by using electromagnetic waves and the process of radiation
- B. by using forced hot air currents through the process of convection
- C. by using the movement of charged particles through the process of induction
- D. by using direct contact of moving particles through the process of conduction

35.

Bill and Mary wanted to have a snack after school. They heated some milk in a pot on the stove to make hot chocolate. They also popped some popcorn in the microwave oven. How did Bill and Mary transfer heat energy to make these snacks?

- A. heating milk by radiation; popping popcorn by radiation
 - B. heating milk by radiation; popping popcorn by convection
 - C. heating milk by conduction; popping popcorn by radiation
 - D. heating milk by convection; popping popcorn by conduction
-

36.

Gasoline, wood, water behind a dam, and a boulder on the edge of a cliff all represent some form of potential energy. What form of potential energy do gasoline and wood have in common?

- A. heat
 - B. light
 - C. chemical
 - D. mechanical
-

37.

On a cold, winter day, Sheena rubs her hands together. Stored chemical energy is transformed into mechanical energy. Due to the Law of Conservation of Energy some of the energy is also transformed into

- A. heat energy.
 - B. light energy.
 - C. solar energy.
 - D. kinetic energy.
-

38.

What form of energy is associated with the movement of charges, usually electrons?

- A. chemical
 - B. electrical
 - C. heat
 - D. sound
-

39.

_____ energy is produced when a force causes a substance to vibrate, and the energy is transferred through the substance in a wave.

- A. Heat
 - B. Light
 - C. Mechanical
 - D. Sound
-

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40.

All waves transmit

- A. energy.
 - B. mass.
 - C. matter.
 - D. radiation.
-

41.

Which of these is one way that mechanical waves differ from electromagnetic waves?

- A. Mechanical waves require energy and electromagnetic waves do not.
 - B. Mechanical waves require a medium and electromagnetic waves do not.
 - C. Electromagnetic waves require a medium and mechanical waves do not.
 - D. Mechanical waves transmit matter and electromagnetic waves transmit energy.
-

42.

Electromagnetic waves and mechanical waves are alike and different. What is one way in which these waves are similar?

- A. Both types of waves require a medium.
 - B. Both types of waves have a frequency.
 - C. Both types of waves transmit matter.
 - D. Both types of waves have a pitch.
-

43.

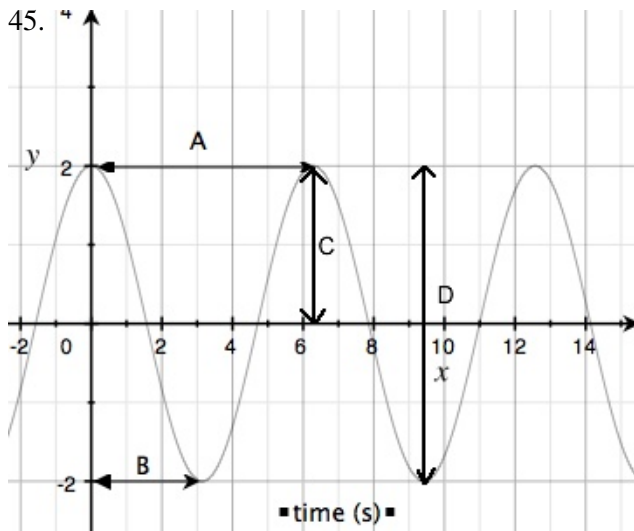
You are sitting on the edge of a pool with your legs in the water. As light waves pass from the pool into the air, it looks like your legs are not attached at the knees where they meet the water. This is because light waves _____ when they pass from one medium to another.

- A. are amplified
 - B. diffract
 - C. reflect
 - D. refract
-

44.

The speed of a sound wave depends MOSTLY on

- A. the amplitude of the wave.
 - B. the frequency of the wave.
 - C. the angle at which it approaches the listener.
 - D. the medium through which the wave travels.
-



After the train passed, the **pitch** of the train whistle became lower. This change in sound would be represented by what change in the diagram above?

- A. The distance represented by "A" would increase.
 - B. The distance represented by "A" would decrease.
 - C. The distance represented by "C" would increase.
 - D. The distance represented by "C" would decrease.
-

46.

The waves in the pool where you are floating have a crest height of about 1 foot. Bobby does a cannonball dive off the side of the pool and sends waves 4 feet high toward your raft. The waves that Bobby produced have a greater

- A. amplitude.
 - B. compression.
 - C. frequency.
 - D. wavelength.
-

47.

You can see your image in a shiny, flat surface because lights waves bounce directly back at you and your eyes. This is an example of

- A. diffraction.
 - B. reflection.
 - C. refraction.
 - D. transparency.
-

48.

You can observe the color of your friends shirt with your eyes because

- A. the shirt produces light waves.
- B. the shirt releases light waves.
- C. light is reflected off of the shirt.
- D. light is transmitted from the shirt.

49.

Green plants look "green" because they

- A. transmit green light.
 - B. reflect green wavelengths of the visible spectrum.
 - C. absorb green wavelengths of the visible spectrum.
 - D. reflect blue and yellow wavelengths of the visible spectrum.
-

50.

You and your father inspect an empty house with the hopes of buying it. You walk through the rooms talking to one another, and you notice that your voices and footsteps are echoing in the big, empty house. What causes the echo?

- A. sound waves moving slowly through air
 - B. sound waves moving around the large rooms
 - C. sound waves refracting around corners in the empty rooms
 - D. sound waves reflecting off smooth, flat surfaces throughout the house
-

51.

Imagine a ringing bell set inside a sealed glass jar. Once all the air is removed and a vacuum is created, the ringing sound is no longer heard. Explain why this happens.

- A. The glass prevents any sound from escaping.
 - B. The lack of air in the jar causes the ringing to stop.
 - C. Without air, the sound waves cannot travel to the ear.
 - D. The pressure of the outside air causes the sound to remain within the jar.
-

52.

Lenny is looking at a sheet of paper that reflects all wavelengths of the visible spectrum that hit it. Lenny is looking at a sheet of paper that appears to be

- A. black.
 - B. violet.
 - C. red.
 - D. white.
-

53.

Sound waves are transmitted fastest through

- A. air.
 - B. liquids.
 - C. solids.
 - D. a vacuum.
-

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54.

It was a cold, sunny day and the ground was covered with fresh snow. Maria wore her black sweatshirt outside to play in the snow. She knew that black would _____ light waves and help keep her warm.

- A. absorb
 - B. diffract
 - C. reflect
 - D. refract
-

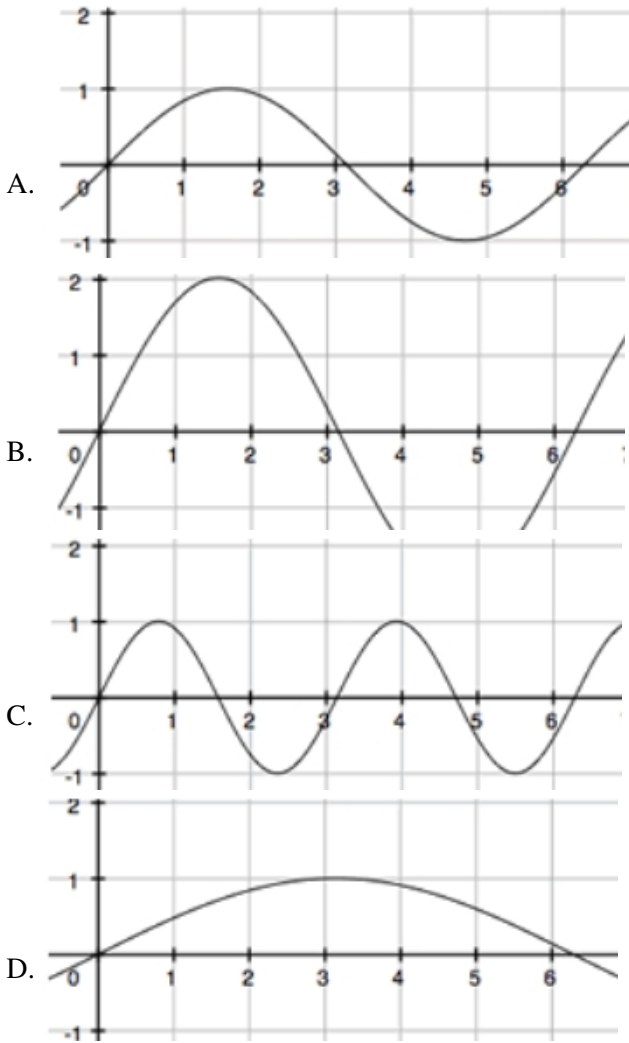
55.

Why does the human eye observe the different colors of a rainbow?

- A. White light is broken down in the eye into its separate colors.
 - B. Different colors of light travel at different speeds to the eye.
 - C. The eye sees different wavelengths of light as different colors.
 - D. The eye sees different colors of light in different locations of the eye.
-

56.

Assume waves A, B, C, and D, illustrated above, each represent a different wave of the electromagnetic spectrum. Which wave would MOST likely cause be energetic enough to damage living human cells?

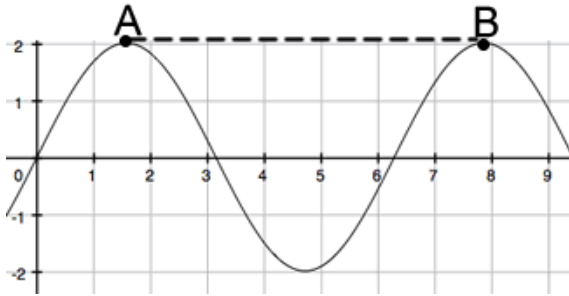


57.

In order for a fish to see a bug just above the surface of the water, light travels from the insect through the air and crosses into the water until it reaches the fishes' eye. Which statement is true regarding the light wave as it travels?

- A. It will bend as it hits the water because it slows down.
- B. It will bend as it hits the water because the water particles move slower than air.
- C. It will travel straight from the bug to the fishes' eye because that is the most direct path.
- D. It will travel straight from the bug to the fishes' eye because it will continue to travel at the speed of light.

58.



The wave pictured above represents a sound wave. If the distance from "A" to "B" increased, what would happen to the pitch?

- A. The pitch would be louder.
 - B. The pitch would be softer.
 - C. The pitch would be higher.
 - D. The pitch would be lower.
-

59.

Porous building materials are often used on the surfaces in classrooms and restaurants because these surface tend to _____ sound waves.

- A. absorb
 - B. refract
 - C. reflect
 - D. transmit
-

60.

As light waves pass through openings in a barrier or around the edges of an object, the waves change direction or

- A. are absorbed.
 - B. diffract.
 - C. reflect.
 - D. refract.
-

61. The distance between one point on a compression and the corresponding point on the next compression in a sound wave is called a —

- A. wavelength.
- B. rarefaction.
- C. crest.
- D. trough.

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62. Which of the following is an example of kinetic energy?

- A. A baseball moving from the pitcher to the catcher
- B. A rock sitting on the top of a large hill
- C. A pendulum at the top of its swing
- D. A new flashlight battery

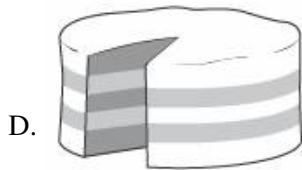
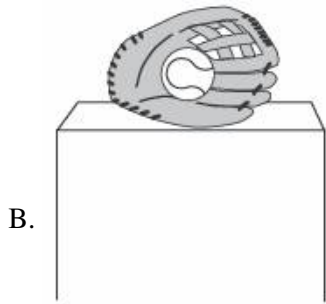
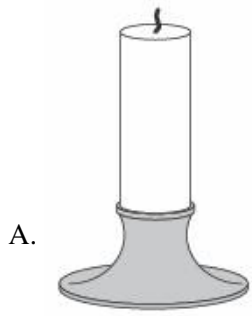
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63. The energy used to move most bicycles is an example of what type of energy?

- A. Electrical
- B. Mechanical
- C. Chemical
- D. Nuclear

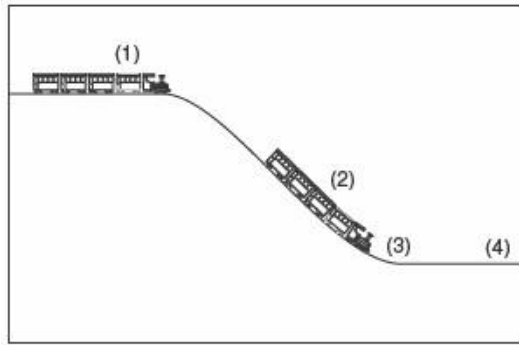
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64. Which of these best shows kinetic energy?



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65. The location on the track where the train has the *greatest* potential energy is —



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

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66. Which of the following would reflect rather than refract light?

- A. Magnifying glass
- B. Mirror
- C. Prism
- D. Lens

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