

Test Name: Energy transformation and conservation

Test Id: 1714084

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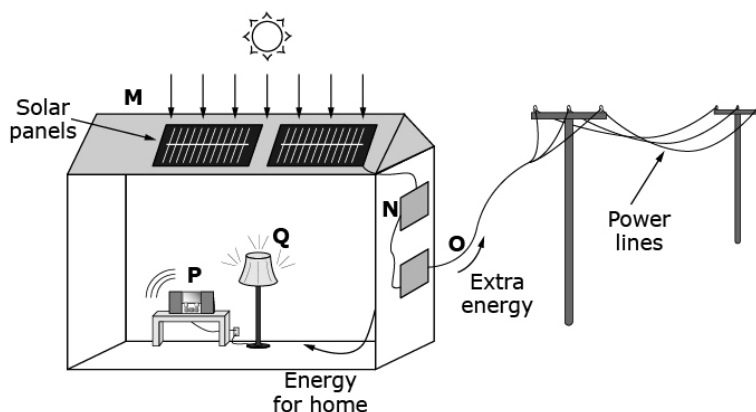
Which transformation of energy occurs when a fan is turned on and the blades start to rotate?

- 1.
- A. thermal energy to kinetic energy
 - B. electrical energy to kinetic energy
 - C. thermal energy to potential energy
 - D. electrical energy to potential energy

Which of the following illustrates the energy transformation that occurs during photosynthesis?

- 2.
- A. electrical → leaf → thermal energy
 - B. thermal energy → leaf → light energy
 - C. light energy → leaf → chemical energy
 - D. chemical energy → leaf → mechanical energy

Directions: The diagram shows a home with solar panels on its roof. Use the diagram to answer any questions that follow.



Match the part of the diagram with the type of energy transformation **most likely** taking place.

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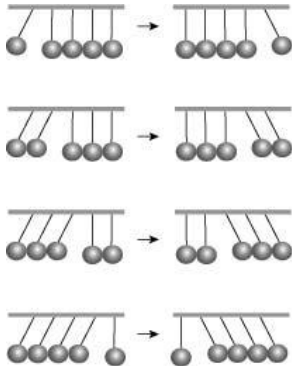
Betsy depends on her electric alarm clock every morning to get up in time for school. What energy transformation happens in Betsy's alarm clock to wake her up in the morning?

- 4.
- A. electrical energy is converted to sound energy
 - B. sound energy is converted to electrical energy
 - C. chemical energy is converted to kinetic energy
 - D. electrical energy is converted to thermal energy

When a person bends a glow stick, a small chamber inside it breaks, releasing a substance that reacts with other substances inside the glow stick. The reaction that takes place causes the glow stick to glow. What type of energy transformation is this?

- 5.
- A. sound energy → light energy
 - B. chemical energy → light energy
 - C. thermal energy → light energy
 - D. electrical energy → light energy

6. This is a Newton's cradle. Newton's cradle shows the conservation of momentum.



Which is the best explanation of how Newton's cradle shows the conservation of momentum?

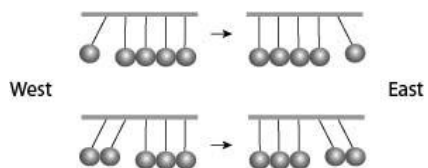
- A. When the first ball hits the second, its momentum stops. An electrical current transfers motion through the balls to the last one. That is why the last ball starts to swing.
- B. When the first ball hits the second, the first ball stops, but its momentum doesn't stop. It is transferred through all the balls. That is why the last ball starts to swing.
- C. When the first ball hits the second ball, the electrons in the second ball are excited, which transfers the energy throughout the system. Energy is the same as momentum.
- D. When the first ball hits the second, new momentum is created from the collision. This momentum is transferred throughout all the balls until it reaches the last one, which then begins to swing.

7. Which is a situation where two hockey pucks could have equal but opposite momentums? Assume that the ice is a frictionless surface.
- A. if the hockey pucks weigh the same
 - B. if the hockey pucks exert the same force on each other in the same direction while traveling at the same speed
 - C. if the hockey pucks are traveling at the same speed, bounce off each other, and move in the opposite direction
 - D. if the hockey pucks have the same mass

According to the law of conservation of momentum, how will the total amount of momentum change when two objects collide?

- 8.
- A. increases
 - B. stays the same
 - C. decreases
 - D. is divided in half

9. This is Newton's cradle.

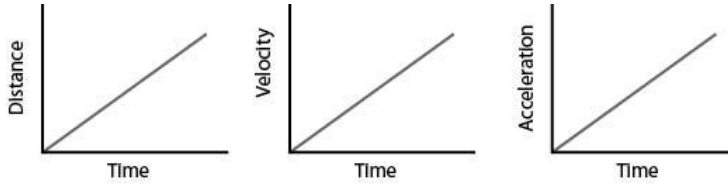


In the image, when one ball is pulled away to the west, the last ball begins to swing to the east while the others stay still. When two are pulled away to the west, the last two begin to swing to the east. If Newton's cradle shows the law of conservation of momentum, predict what will happen if three balls are pulled away.

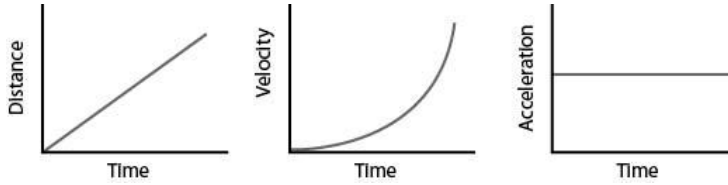
- A. When three are pulled away to the west, the last three begin to swing to the east, then the motion repeats in the other direction.
- B. When three are pulled away to the west, the last three begin to swing to the east, then the motion stops.
- C. When three are pulled away to the west, two begin to swing to the east, then the motion repeats in the other direction.
- D. When three are pulled away to the west, the first three begin to swing to the east, then the motion repeats in the same direction.

10. A bicycle rider traveling to the right at a constant speed drops a ball. Which of the following pairs of graphs best represents the vertical motion of the ball relative to the ground?

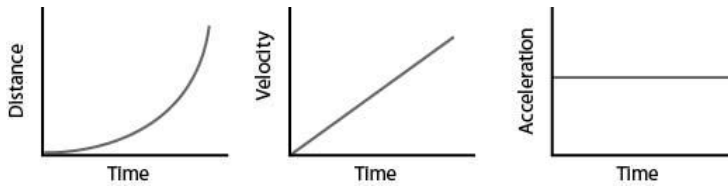
A.



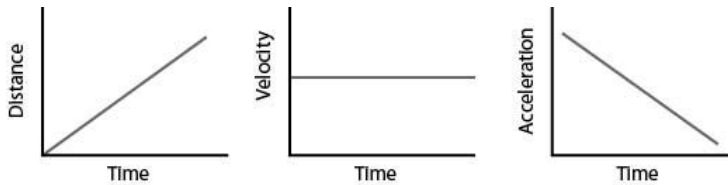
B.



C.



D.

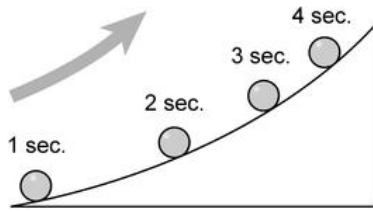


What type of motion moves in one direction along a straight line?

11.

- A. feed motion
- B. rotating motion
- C. linear motion
- D. reciprocating motion

The picture shows a ball rolling up a ramp.



Which statement **best** describes the motion of the ball?

12.

- A. The ball's speed is increasing.
- B. The ball's speed is decreasing.
- C. The ball's motion is constant.
- D. The ball's motion is stopping.

Which statement correctly describes a sample in the gaseous phase?

13.

- A. It has a large degree of freedom of motion, allowing it to retain its shape no matter the container in which it is confined.
- B. It has a small degree of freedom of motion, allowing it to retain its shape no matter the container in which it is confined.
- C. It has a large degree of freedom of motion, allowing it to fill any container in which it is confined.
- D. It has a small degree of freedom of motion, allowing it to fill any container in which it is confined.

Newton's first law of motion states that an object at rest will remain at rest or an object in motion will remain in a constant motion, unless acted on by an outside force. Another name for this law is the

14.

- A. law of acceleration.
- B. law of gravity.
- C. law of inertia.
- D. law of momentum.

Unbalanced forces

15.

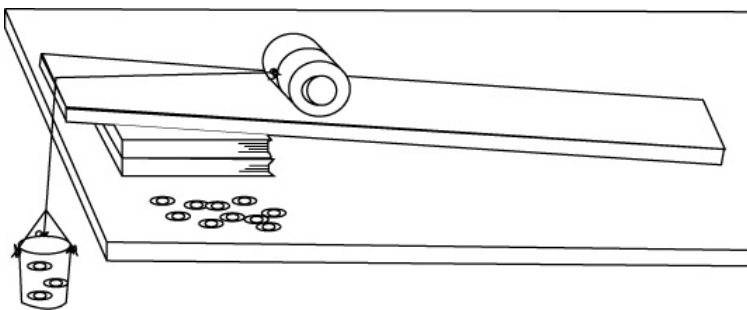
- A. make an object move opposite the applied force.
- B. can change an object's speed but not direction.
- C. maintain the constant motion of an object.
- D. cause the motion of an object to change.

Glass starts out as a mixture of mostly solid sand particles. However, in order to mold or blow glass, the particles must change phase to the liquid state. How can the sand's state be changed?

16.

- A. by removing all the heat from the sand system to strengthen bonds between solid particles and decrease freedom of motion
- B. by increasing the density of the sand system to strengthen bonds between solid particles and increase freedom of motion
- C. by decreasing the mass of the sand system to weaken bonds between solid particles and decrease freedom of motion
- D. by adding a lot of heat to the sand system to weaken bonds between solid particles and increase freedom of motion

Jean set up the apparatus shown in the diagram below and noticed that the object he placed on the ramp did not roll downward.



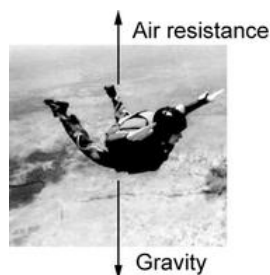
What force was responsible for keeping the object from moving down the ramp?

17.

- A. electrical force
- B. magnetic force
- C. gravitational force
- D. unbalanced force

Directions: The skydiver in the picture below jumped from an airplane, and the force of gravity pulled downward on her, increasing her velocity until the force of air resistance was equal to the force of gravity. This situation is called terminal velocity, and it occurs when a typical skydiver reaches a

speed of a constant 195 kilometers per hour. Use the picture to answer any questions that follow.



What is happening to the skydiver's kinetic and potential energies as she falls at terminal velocity?

18.

- A. Her kinetic energy decreases and her potential energy decreases.
- B. Her kinetic energy increases and her potential energy decreases.
- C. Her kinetic energy remains constant and her potential energy decreases.
- D. Her kinetic energy decreases and her potential energy remains constant.

The picture shows a ship.



Source: Public Domain

The hull of a ship is designed to make the ship go faster. How does this pointed hull increase the speed of the ship?

19.

- A. It maintains the effect on water friction on the ship.
- B. It increases the effect of water friction on the ship.
- C. It eliminates the effect of water friction on the ship.
- D. It reduces the effect of water friction on the ship.

A car is driving down the road at a constant speed. Which of the following is true about the forces acting on the car?

20.

- A. The normal force of the tires is greater than the force of motion of the car.
- B. The force of gravity on the car is greater than the normal force of the car.
- C. The force of motion of the car is greater than the force of friction from the road.
- D. The friction force of the tires is greater than the force of gravity from the road.

