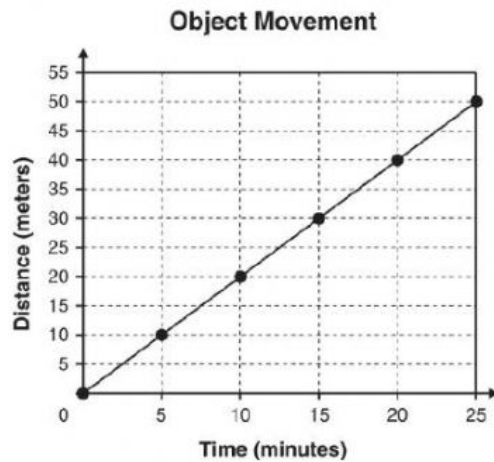


Name: _____

Date: _____

1. The graph below shows the movement of an object at several points in time.



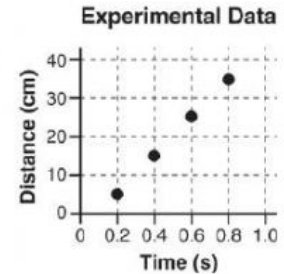
What is the average speed of the object?

- A. $\frac{0.5 \text{ meters}}{\text{minute}}$ B. $\frac{2 \text{ meters}}{\text{minute}}$
 C. $\frac{25 \text{ meters}}{\text{minute}}$ D. $\frac{50 \text{ meters}}{\text{minute}}$

2. Data from an experiment are presented below.

Experimental Data

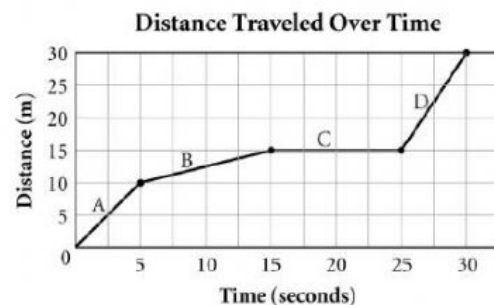
Distance	Time
5 cm	0.2 s
15 cm	0.4 s
25 cm	0.6 s
35 cm	0.8 s



The slope of the graph represents what characteristic of an object?

- A. displacement B. force
 C. speed D. inertia

3. The graph below shows the distance a student walks down a hall over time. Use the information shown on the graph to answer the following question(s).



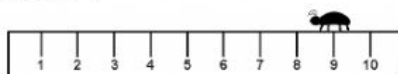
During which time interval was the student moving the fastest?

- A. A B. B C. C D. D

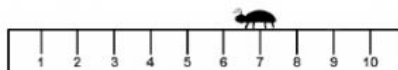
4. Use the pictures below to answer the question.

Insect Motion

Picture 1



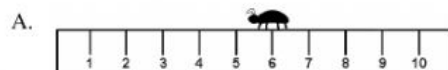
Picture 2 (one minute later)



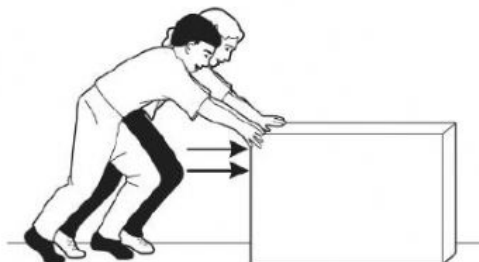
Tina was measuring the speed of a moving insect.

- Picture 1 shows where the insect was when Tina started observing it.
- Picture 2 shows where the insect was after 1 minute.

If the insect keeps moving at the same speed, which picture shows where it will *most likely* be after 1 more minute?



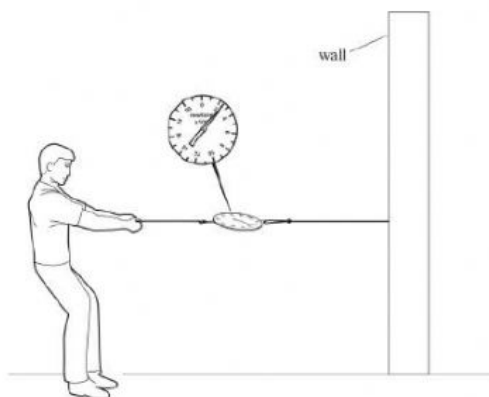
5. Two people are trying to push a large box across a floor. Each person pushes with an equal amount of force.



The total amount of force they exert on the box is 500 newtons. Despite their efforts, the box will not move. What is the amount of force exerted by the box on each person?

- A. 0 newtons B. 250 newtons
C. 500 newtons D. 1,500 newtons

6. The picture below shows a student pulling on a rope that is attached to a wall. wall



Which statement correctly describes the amount of force applied by the wall as the student continues to apply a 250-newton force?

- A. The wall pulls with a force of 125 newtons against the student.
- B. The wall pulls with a force of 250 newtons against the student.
- C. The wall exerts twice as much force as the student.
- D. The wall exerts no force since it is stationary.

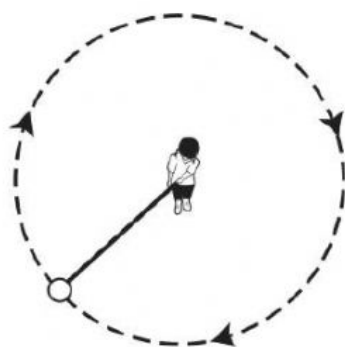
7. The bodies of many cars are designed to compress or crumple during an accident.



Why are cars built with a crumple zone?

- A. The crumple zone is made from cheaper materials, so the car costs less to make.
- B. The crumple zone is made from cheaper materials, so it costs less to repair after an accident.
- C. The crumple zone absorbs the force of an impact, reducing the chance that passengers get injured.
- D. The crumple zone transfers the force of an impact from the car to the object it hits, reducing the chance that passengers will get injured.

8. The diagram below shows the top view of a student swinging a ball above her head.

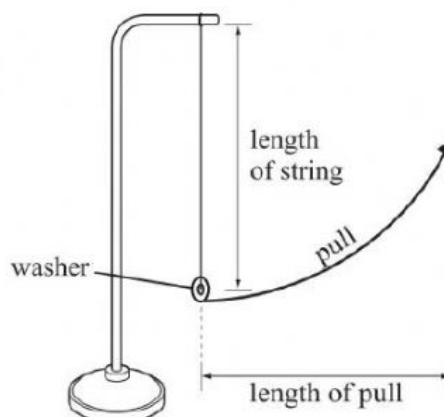


Key	
	= string
	= ball
	= motion of ball

This ball continues to move in a circular path because

- A. gravity pulls the ball downward.
- B. some air resistance is present.
- C. the string applies a force against the ball.
- D. the weight of the string is the same weight as the ball.

9. A student conducted many trials to determine the effect that variables had on the cycle of a pendulum.



Pendulum Experiment Data

Trial	Length of String (cm)	Length of Pull (cm)	Number of Washers*	Time of One Cycle (sec)
1	40	10	1	1.3
2	40	20	1	1.3
3	40	20	2	1.3
4	55	20	2	1.5
5	55	20	3	1.5

*Each washer has a mass of 10 grams.

A change in which variable changed the time of one cycle?

- A. length of string
- B. length of pull
- C. mass of washers
- D. number of washers

10. A ball was attached to the end of a string and spun in a circle as shown in Figure 1 below. The ball moved in a counter-clockwise direction when seen from above as shown in Figure 2.

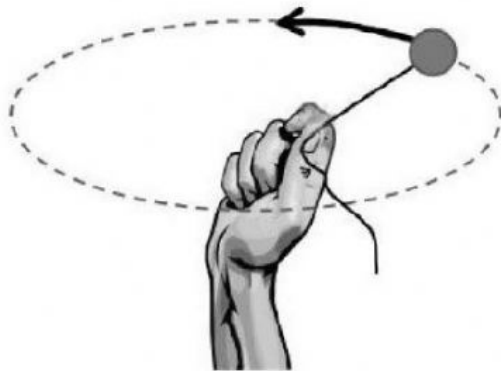


Figure 1 (view from side)

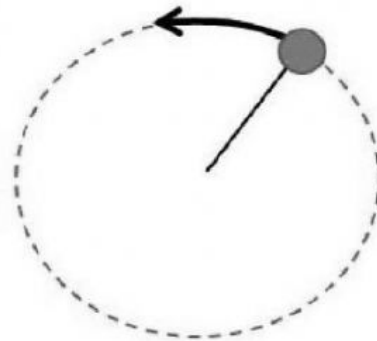
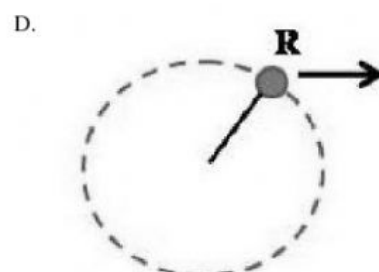
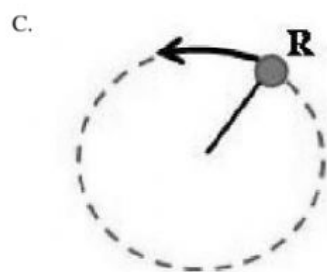
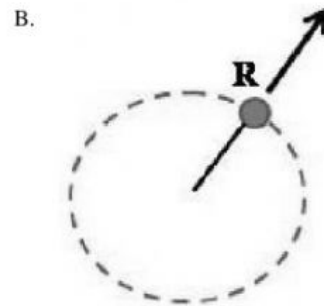
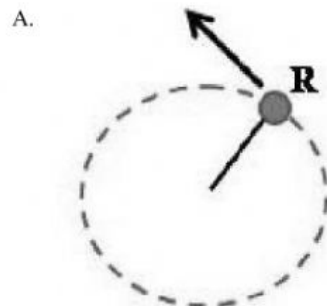
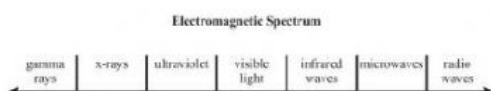


Figure 2 (view from above)

After several spins, the string was released when the ball was at point R. Which diagram shows the direction that the ball would fly the instant the string was released?



11. A diagram of the electromagnetic spectrum is shown below.



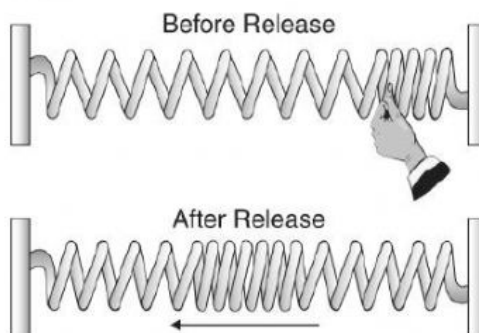
Sunscreen is a lotion used to protect skin from exposure to the Sun. This sunscreen protects a person's skin from wavelengths that are

- A. longer than radio waves but shorter than x-rays.
- B. longer than x-rays but shorter than infrared waves.
- C. longer than microwaves but shorter than infrared waves.
- D. longer than visible light waves but shorter than radio waves.

12. A radio station transmits to a receiving antenna. The radio wave sent is a

- A. sound wave.
- B. torsional wave.
- C. longitudinal wave.
- D. transverse wave.

13. A stretched spring attached to two fixed points is compressed on one end and released, as shown below.

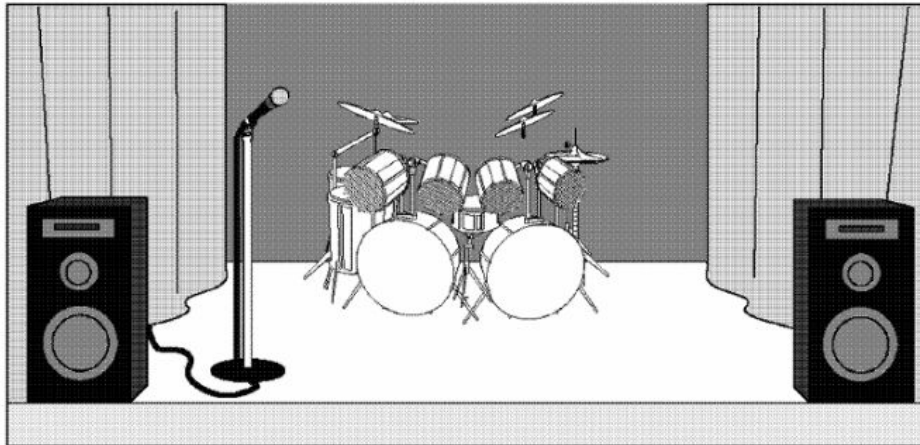


The resulting wave travels back and forth between the two fixed ends of the spring until it comes to a stop. This mechanical wave is an example of a

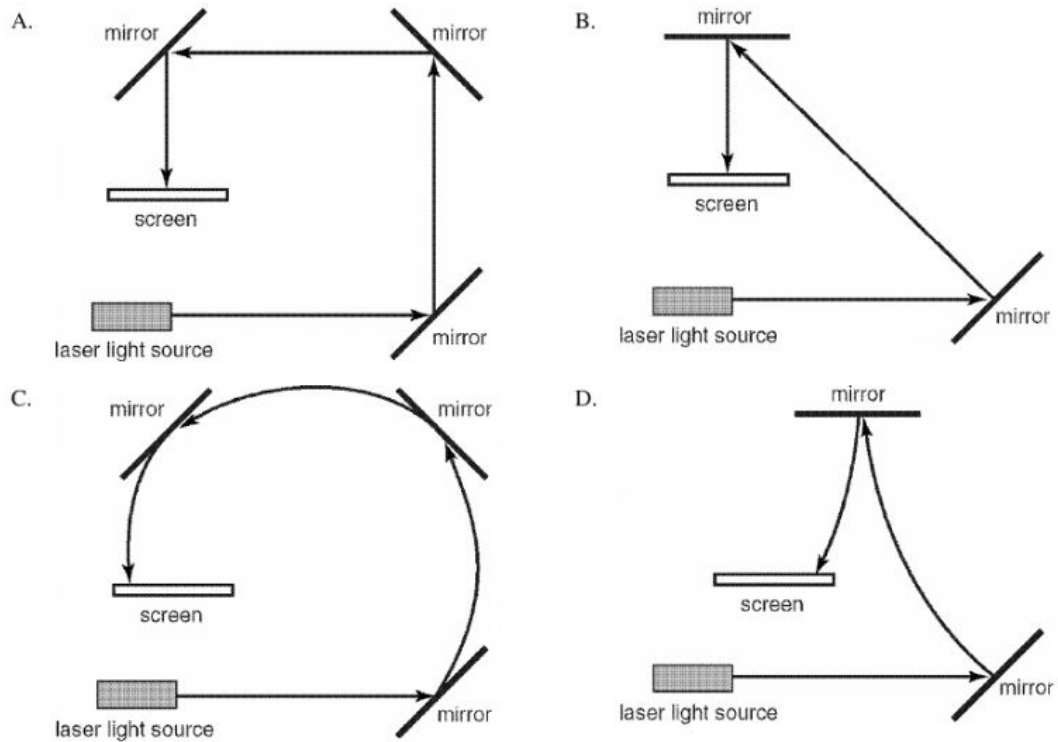
- A. transverse wave.
- B. longitudinal wave.
- C. superpositioned wave.
- D. refracted wave.

14.

The Concert



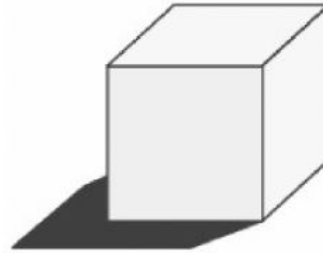
The students wanted to reflect a laser light off some flat mirrors in the auditorium so that it hits somewhere on the screen. Which of the following diagrams best shows how the mirrors could be placed and the path that the light will take?



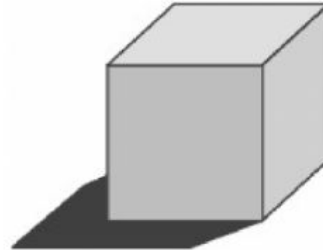
15. Which of the following explains why an apple looks red?
- A. The apple is reflecting red light and absorbing all other colors of light.
 - B. The apple is absorbing red light and reflecting all other colors of light.
 - C. The apple is absorbing all colors of light, but it absorbs the red light better.
 - D. The apple is reflecting all the light.

16. Which of these cubes reflects the *most* light?

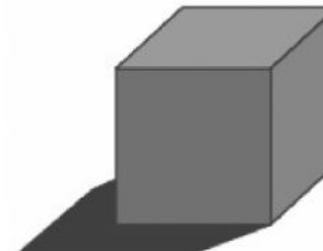
A.



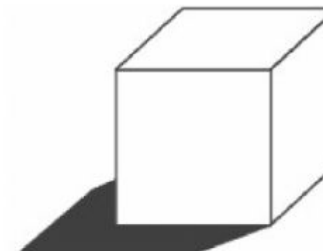
B.



C.



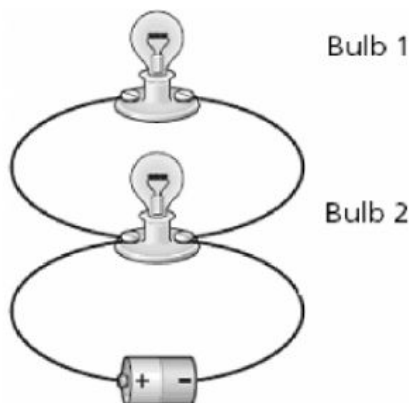
D.



17. A sound wave traveling through a solid material has a frequency of 500 hertz. The wavelength of the sound wave is 2 meters. What is the speed of sound in the material?

A. $250 \frac{\text{m}}{\text{s}}$ B. $500 \frac{\text{m}}{\text{s}}$
 C. $1000 \frac{\text{m}}{\text{s}}$ D. $250,000 \frac{\text{m}}{\text{s}}$

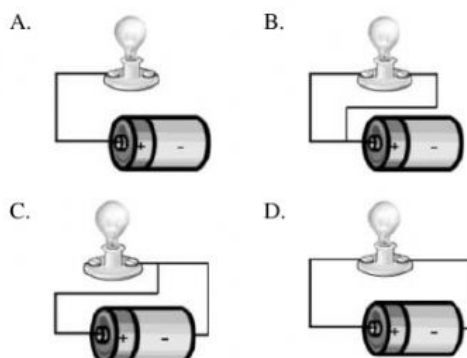
18. Look at the diagram of the circuit below.



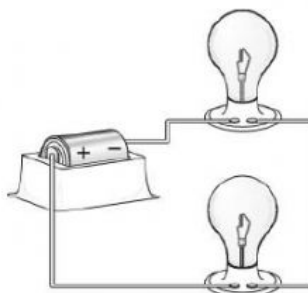
Which statement *best* describes what will happen if Bulb 2 burns out?

- A. Bulb 1 will also burn out.
 B. Bulb 1 will flash on and off.
 C. Bulb 1 will stay lit and become brighter.
 D. Bulb 1 will stay lit but will become less bright.

19. Each picture shows a light bulb connected to a battery. Which bulb will light?



20. The diagram below shows an electrical circuit.



This circuit is a series circuit because

- A. it has two light bulbs.
 B. the same current flows through both light bulbs.
 C. it uses a single battery.
 D. the current is divided between the light bulbs.