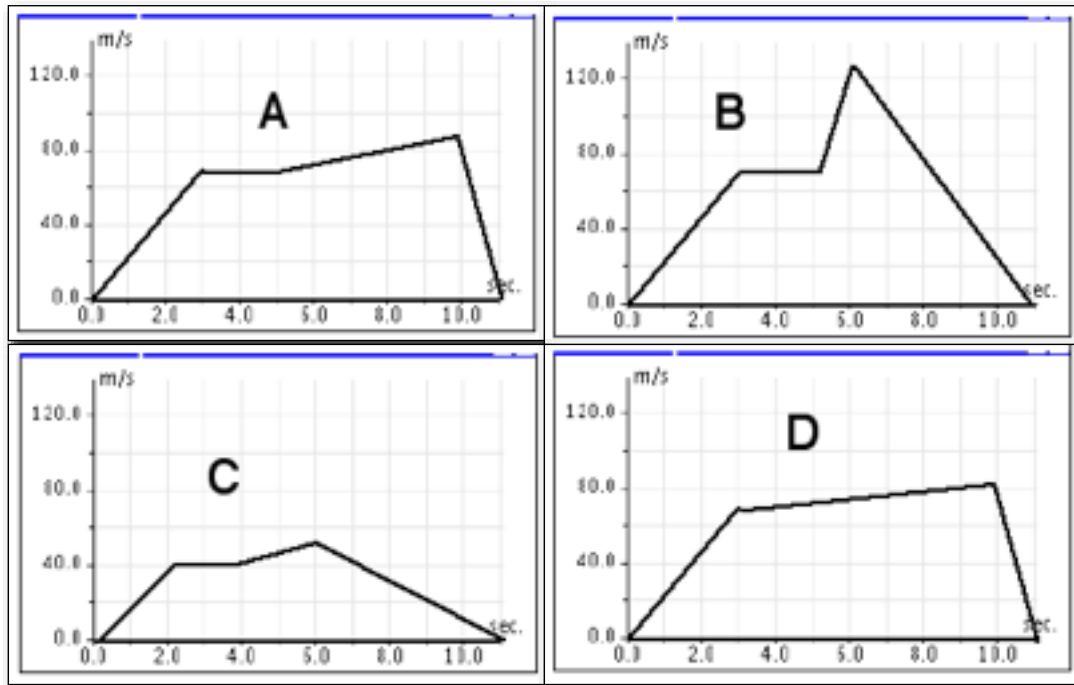


Quiz Question 1

Consider the following scenario. A car speeds up from rest, then travels at a constant speed, then speeds up again, but at a slower rate than at first. Then the car slams on its brakes, slowing down at a rate greater than the rates of speeding up. Which of the following speed-time graphs most reasonably matches this description of the car's motion?

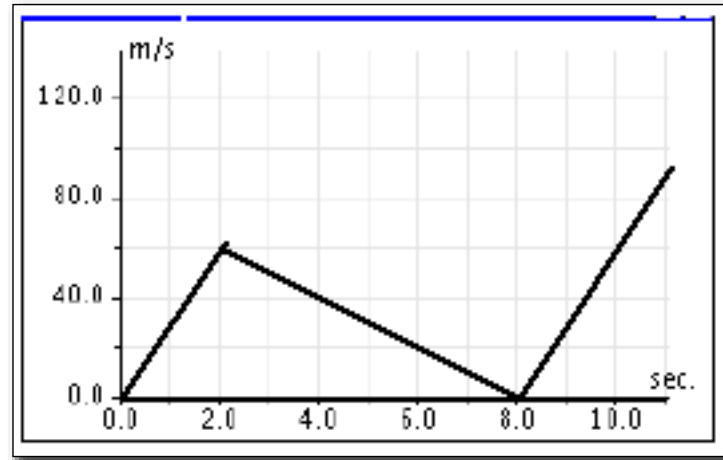


Feedback: Graph A is the correct answer.

Quiz Question 2

To the right is the speed-time graph for an object that can move in either direction along a track.

Which of the following statements could best match the speed-time graph?



- A) The object first speeds up at a certain rate, then speeds up at a lower rate, and finally speeds up at a higher rate than it initially sped up.
- B) The object speeds up at a certain rate, then slows down at an even greater rate to a momentary stop, changes direction, and finally speeds up again at the same rate as it initially sped up.
- C) The object speeds up at a certain rate, then slows down at a lower rate to a momentary stop, changes direction, and finally speeds up at a higher rate than it initially sped up.
- D) The object speeds up at a certain rate, then slows down at a lower rate to a momentary stop, changes direction, and finally speeds up again at the same rate as it initially sped up.

Feedback: Choice D is the correct answer.

Quiz Question 3

During a lesson, you are asked to respond to the following three statements.

Statement #1: How do you think the speed-time graph would change if you gave it a harder push?

Statement #2: Record the speed-time graph after the instructor gives the car a push.

Statement #3: Why are the slopes of the two portions of the speed-time graph different?

Which of these statements are asking you to make an observation, make an inference, or make a prediction?

- A) Statement #1 is an observation, #2 is an inference and #3 is a prediction.
- B) Statement #1 is an inference, #2 is an observation and #3 is a prediction.
- C) Statement #1 is a prediction, #2 is an observation and #3 is an inference.
- D) Statement #1 is a prediction, #2 is an inference and #3 is an observation.

Feedback: Choice C is the correct answer.

Quiz Introduction

A child sees an empty soda can resting on the icy surface of a frozen pond and throws a stone at it. The stone hits the can, which then slides across the ice, decreasing in speed as it does so. At the edge of the pond the can hits a pile of snow and stops.

Suppose you were asked to use energy ideas to write an explanation for ***why the can starts moving***. The questions in this homework quiz concern different aspects of such an explanation.

Quiz Question 1

- 1) Which of the interactions below should your explanation focus on?
- A. The interaction between the child's hand and the stone
 - B. The interaction between the stone and the soda can.
 - C. The interaction between the soda can and the ice.
 - D. The interaction between the soda can and the pile of snow.

Feedback: Choice B is correct. It is the interaction between the stone and the can that starts the can moving, so that is the one an explanation should focus on.

Quiz Question 2

- 2) Which of the following would be the appropriate energy giver in such an explanation?
- A. The child.
 - B. The stone.
 - C. The soda can.
 - D. The ice.
 - E. The pile of snow.

Feedback: Choice B is correct.

Quiz Question 3

- 3) Which of the following would be the appropriate energy receiver in such an explanation?
- A. The child.
 - B. The stone.
 - C. The soda can.
 - D. The ice.
 - E. The pile of snow.

Feedback: Choice C is correct.

Quiz Question 4

- 4) Which of the following statements would be the most appropriate to include as part of this explanation?
- A. There is a transfer of energy from the child to the stone.
 - B. There is a transfer of energy from the soda can to the ice.
 - C. There is a transfer of energy from the stone to the soda can.
 - D. There is a transfer of energy from the soda can to the pile of snow.
 - E. None of these are important.

Feedback: Choice C is correct.

Quiz Question 5

- 4) Which of the following statements would be the most appropriate to include as part of this explanation?
- A. Because its kinetic energy decreases, the stone stops moving when it hits the can.
 - B. Because its kinetic energy decreases, the soda can slows down as it moves across the ice.
 - C. Because the child uses his muscles, his chemical potential energy decreases.
 - D. Because its kinetic energy increases, the stone starts moving when the child throws it.
 - E. None of these is important.

Feedback: Choice E is correct. The important statement would be 'Because its kinetic energy increases, the can starts moving when the stone hits it', but that is not one of the options.