#CRESTInnovator

CREST Science Olympiad (CSO)
Worksheet for
Class 7

Topic

Speed, Time and Distance

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Worksheet on Speed, Time and Distance

1. **A runner completes a race in 2 hours and 30 minutes. If the average speed is 12 km/h, what distance did the runner cover?**

   a. 24 km
   b. 30 km
   c. 36 km
   d. 48 km

2. **Consider the following statements and choose the correct option:**
   Statement I: Distance and displacement are always equal for a moving object.
   Statement II: Speed and velocity are always equal for a moving object.

   a. Statement I is correct but statement II is incorrect.
   b. Statement I is incorrect but statement II is correct.
   c. Both statements are correct.
   d. Both statements are incorrect.

3. **How can you experimentally determine the time period of a simple pendulum?**

   a. Measure the length of the pendulum and divide it by its mass
   b. Measure the distance covered by the pendulum in one swing
   c. Measure the time taken for the pendulum to complete one full swing
   d. Measure the angle of displacement of the pendulum from its mean position

4. **A distance-time graph shows a straight line with a negative slope. What does this indicate about the object's motion?**

   a. The object is moving at an increasing speed
   b. The object is moving at a decreasing speed
   c. The object is at rest
   d. The object is moving in a circular path

5. **An experiment is conducted with two objects moving in the same direction. Object A covers 200 meters in 20 seconds, while object B covers 400 meters in 40 seconds. Which object has a higher speed?**

   a. Object A
   b. Object B
   c. Both have the same speed
   d. It cannot be determined from the given information

Answer Key

1. b - To find the distance the runner covered, we can use the formula for speed:
   Speed = Distance / Time

   Given that the average speed is 12 km/h and the time taken is 2 hours and 30 minutes, we need to convert the time to hours:
   Time = 2 hours + (30 minutes / 60) hours
   Time = 2.5 hours

   Now we can rearrange the formula to solve for distance:
   Distance = Speed × Time
   Distance = 12 km/h × 2.5 h
   Distance = 30 km

2. d - Statement I is incorrect: Distance and displacement are not always equal for a moving object. Distance refers to the total path travelled, while displacement refers to the change in position from the starting point to the ending point. They can be equal only if the object moves in a straight line without changing direction.
   Statement II is incorrect: Speed and velocity are different concepts. Speed refers to the rate at which an object covers distance, while velocity takes into account both speed and direction. They can be equal only if the object moves in a straight line without changing direction.

3. c - To experimentally determine the time period of a simple pendulum, you can measure the time taken for the pendulum to complete one full swing. This can be done by starting a stopwatch when the pendulum is released from its initial position, and stopping the stopwatch when it returns to the same position after completing one full swing. The measured time will give you the time period of the pendulum, which is the time taken for it to complete one oscillation.

4. b - A distance-time graph with a straight line and a negative slope indicates that the object is moving at decreasing speed. This means that over time, the object is covering smaller distances in each successive time interval. The steeper the negative slope, the faster the speed is decreasing.

5. c - Both object A and object B have the same speed. Speed is determined by dividing the distance covered by the time taken. In this case, both objects cover the same distance-time ratio:
   Object A: 200 meters / 20 seconds = 10 meters per second
   Object B: 400 meters / 40 seconds = 10 meters per second
   Since both objects have the same speed of 10 meters per second, the correct answer is that both objects have the same speed.

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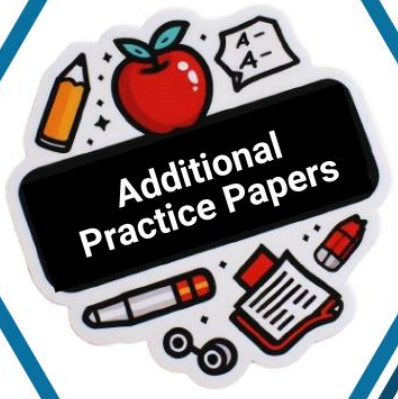

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