BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI – 110034

SUBJECT: -SCIENCE

CHAPTER: - Motion and Time

Week -8th to 11th December, 2020.   **Number of Blocks: 1/2**

Dear Students,

- There is only **1 Assignment**.
    - ➢ Assignment: Based on Sub topics given below.
- Attempt the assignment in Science notebook.
- **Video links** have been provided for better understanding of the concept through visuals. Watch the videos carefully as these will help you in doing the assignment.
- Read the lesson from **NCERT textbook** also.

SUB TOPICS:

- Types of motion
- Speed, Average speed
- Uniform and non-uniform motion

INSTRUCTIONAL AIDS:

- You-tube links: https://www.youtube.com/watch?v=8qh--3X6E5w
- https://www.youtube.com/watch?v=8qh--3X6E5w
- https://www.youtube.com/watch?v=EfLLkGjBKog
- https://www.youtube.com/watch?v=SURFFUeLev4
- NCERT Link: http://ncertbooks.prashanthellina.com/7_Science.html

LEARNING OUTCOMES:
By the end of this lesson *each learner will be able to*

- Measure and calculate speed of the moving objects.
- Differentiate between uniform and non-uniform motion.

LESSON DEVELOPMENT:
In our daily routine, we usually see some objects at rest and others in motion like birds flying, fish swimming, planets moving around the sun, etc., are all in motion. When an object changes its position with time, we often perceive an object to be in motion, e.g. when the position of a car changes with time, we say that the car is moving or the car is in motion.

Types of Motion

The motion of all the objects is not of the same type. There are four different types of motion shown by the different objects.

Rectilinear motion: The motion possessed by the body moving along a straight-line path, is called rectilinear motion,
e.g. the motion of a train on a straight bridge.

Circular motion: The motion possessed by a body when it moves along a circular path, is called circular motion,
e.g. the motion of a child in a merry-go-round, motion of the earth around the sun in a circular orbit.

Rotational motion: The motion possessed by a body when it spins about a fixed axis, is called rotational motion,
e.g. the motion of the earth about its axis, spinning top, the motion of blades of a fan.

Periodic motion: The motion which repeats itself after regular intervals of time, is called periodic motion,
e.g. the motion of the swing, to and fro motion of a simple pendulum.

Slow or Fast Motion

An object which takes a long time to cover a certain distance is known as slow while the other object which takes less time to cover the same distance is known as fast,
e.g. if your school is at a distance of 5 km from your home and you want to go to school by bicycle, then it may take about 25 min to reach the school and if you go to school by school bus, then the same distance can be covered only in 10 min.
It means that a bicycle takes a longer time than the bus.
Thus, the most convenient way to determine which of the two objects is moving faster is to compare the distance moved by them in a unit time which is known as speed.

Speed

The distance travelled by an object per unit time (either in one hour, in one minute or in one second) is known as speed of the object. A slow-moving object is said to have a low speed and a fast-moving object is said to have high speed. So, if we know the distance covered by two buses in one hour, then we can answer which one is slower. Therefore, the formula for calculating the speed of an object can be given by

Speed = Distance travelled/Time taken

e.g. If a car travels a distance of 100 km in 2 h, then the speed of this car is given by
Speed = 100km/2h = 50 km/h
It shows that the car will travel a distance of 50 km in 1 h. It does not matter if a car seldom moves with a constant speed for one hour as it starts moving slowly and then picks up speed. So, when we say that the car is moving with a speed of 50 km/h, then we do not bother whether the car has been moving with a constant speed or not during that hour. Therefore, the speed calculated here is the **average speed** of the car.

Non-Uniform and Uniform Motions

In everyday life, we seldom find objects moving with a constant speed over long distances or for long durations of time. If the speed of an object moving along a straight-line keeps changing, its motion is said to be non-uniform motion.

On the other hand, an object moving along a straight line with a constant speed is said to be in uniform motion. In this case, the average speed is the same as the actual speed.

Units of Speed

The unit of speed depends upon the unit of distance and the unit of time used.

- The metre is the standard unit of distance and second is the standard unit of time. So, the standard unit of speed is metre per second (m/s).
- The large values of speed are expressed in kilometre per hour (km/h) and in this case, the distance travelled is measured in terms of kilometre and time taken is measured in an hour.
- The small values of speed are expressed in centimetre per second (cm/s) and in this case, the distance travelled is measured in terms of centimetre and time taken is measured in second.

If we have to compare the speeds of a number of objects, then we must express the speeds of all those objects in the same unit.

ASSIGNMENT-1

1) Which of these defines the speed of an object?
(a) The size of the object and the distance covered.
(b) Total covered distance divided by total time taken.
(c) The length of space between two particular points.
**(d)** Total covered distance multiplied by total time taken.

2) During a race, a cyclist covers a total of 30 km distance in an hour. What is the average speed of the cyclist?
(a) 10 km/hr
(b) 20 km/hr
(c) 30 km/hr
(d) 300 km/hr

3) A student drops a ball from a slope. He notices the ball rolling down as shown in the image.
Which of these statements is true about the motion?
(a) The student is in motion as he is standing.
(b) The student is in motion as he drops the ball.
(c) The ball is in motion as it rolls down the slope.
(d) The ball is in motion as its shape changes over time.
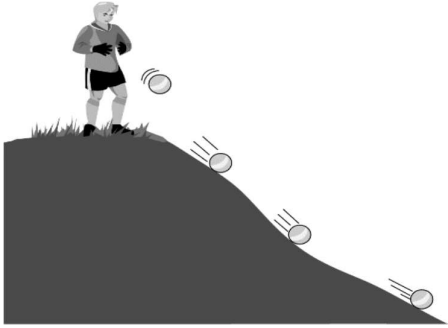
4) A car covers a total of 200 kilometres in 4 hours. What is the average speed of the car?
(a)40 km/hr
(b)50 km/hr
(c)100 km/hr
(d)800 km/hr

5) A person starts riding at 9:00 am to reach a location X which is about 175 km away from the
starting point. He drives at an average speed of 70 km/hr. When is the person likely to reach the
destination?
(a)10:00 am
(b)10:30 am
(c)11:00 am
(d)11:30 am

6)Differentiate between uniform and non-uniform motion. Give one example of each.

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