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Different reference materials. Used are cited at the end of the
sheet.*

*The purpose is to support students with understanding, learning and connecting
the concept with real situation.*

Learning objectives - Understand the difference between instantaneous and average velocity.

Focus Criteria - IB MYP - Criterion A

Important terms

- Instantaneous velocity is the velocity at a particular point. It is found by drawing the tangent at that point on the displacement - time graph and finding out the slope of that tangent
- Average velocity is the velocity between two points and is found by drawing the shortest line between two points and finding the slope of that line.

The below simulation link will further help you to understand the difference.
Also answer the below questions in reference to the link shared below

Instantaneous / average velocity - [Simulation link](#)

Question 1

Use the simulation link above to find the instantaneous velocity at time $T = 1$ second and at time $T = 5$ second.

Analyse the difference in two values and what does that indicate about the motion of the object at that time.

Question 2

Use the simulation above to find the time when the instantaneous velocity is zero. Outline what this value indicates about the motion at that time.

Question 3

Use the simulation above to find the average velocity between time $T = 1$ seconds and time $T = 5$ seconds.

Compare that value with your answer to questions 1 and 2 above and explain with reference to motion of the object.

Question 4

Use the simulation above to find the average velocity between time $T = 1$ second and time $T = 3$ seconds. Compare that value with your answer to question 3 above and explain with reference to difference in motion between 1 and 5 seconds and 1 and 3 seconds.

Question 5

- Use the simulation above to find the time at which the object is at the initial position again.
- Also use the simulation to check whether the velocity is increasing or decreasing between 6 to 9 seconds. Justify your answer.
- Explain the entire motion on the object from time $T = 0$ to Time $T = 9$ Seconds.