

➤ Main Ideas, Key Points, Questions:

After watching the video segment, write down key points, main ideas, and big questions.

➤ Objective(s):

- *Differentiate between and give examples of average acceleration, constant acceleration, and instantaneous acceleration.*
- *Use constant acceleration kinematics equations to solve for displacement, initial velocity, final velocity, time, or acceleration based on given and unknown quantities.*

➤ Notes:

During the video segment, use words, phrases, or drawings to take notes.

➤ Summary:

After watching the video segment, write at least three sentences explaining what you learned. You may ask yourself: "If I was going to explain this to someone else, what would I say?"

Answer the following.

1. Define acceleration in your own words.

Acceleration is the rate of change of an object's velocity.

2. What kind of quantity is acceleration? What information must we include when describing an object's acceleration?

Acceleration is a vector quantity, so we must include the magnitude

(how quickly the velocity is changing) and the direction.

3. Fill in the equation for average acceleration below:

$$\text{average acceleration} = \frac{V_{\text{final}} - V_{\text{initial}}}{t}$$

4. What are the units for acceleration?

$$m/s/s \longrightarrow m/s^2$$

5. What are the three ways that acceleration can occur?

Objects can speed up, slow down, or change direction.

6. What is an object doing if its initial velocity and acceleration are in the same direction?

If an object's initial velocity and acceleration are in the same direction, the object is speeding up.

7. What is an object doing if its initial velocity and acceleration are in opposite directions?

If an object's initial velocity and acceleration are in opposite directions, the object is slowing down.

Answer the following.

8. Define the following types of acceleration:

- constant acceleration:

a constant rate of change in an object's velocity

- instantaneous acceleration:

how an object's velocity is changing at a specific point in time

- average acceleration:

how an object's velocity changes over a period of time

9. How do initial velocity and final velocity differ?

Initial velocity is an object's velocity before it undergoes acceleration,

and final velocity is an object's velocity after acceleration occurs.

10. List the four constant acceleration kinematics equations below:

$$v_f = v_i + at$$

$$d = \frac{1}{2}(v_i + v_f)t$$

$$d = v_i t + \frac{1}{2} at^2$$

$$v_f^2 = v_i^2 + 2 ad$$