



LEQ: How can equations be used to describe the motion of an object?

Objective: Given appropriate information, calculate the acceleration of an object (including units).

Acceleration

Changing Velocity

A blue-tinted photograph of the Golden Gate Bridge, showing its suspension towers and cables against a clear sky. The bridge spans across the water, with the towers and cables receding into the distance.

Acceleration

- ◆ Galileo developed the concept of **acceleration** in his experiments with inclined planes.
- ◆ <http://www.teachersdomain.org/resources/lsp07/sci/phys/maf/ballincline/index.html>
- ◆ http://www.msad49.org/ljhs/WonWorld/Inter2/lsp07_vid_ballincline/lsp07_vid_ballincline.html

Acceleration

◆ Galileo defined acceleration as the rate of change of velocity

◆ Acceleration = $\frac{\text{Change of velocity}}{\text{Time interval}}$

◆ $a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{t}$

A photograph of the Golden Gate Bridge at night, with the bridge's towers and suspension cables illuminated against a dark blue sky and water. The bridge spans across the water, and the lights create a reflection on the surface.

Acceleration

- ◆ There are three ways a velocity can change:
 1. Increase velocity (**speed up**)
 2. Decrease velocity (**slow down**)
 3. Change directions (**turn**)
- ◆ All three of these changes in velocity are forms of **acceleration**.

The background of the slide is a photograph of the Golden Gate Bridge at night. The bridge's towers and suspension cables are silhouetted against a dark blue, misty sky. The water below is also dark and reflects the bridge's structure. The overall mood is serene and atmospheric.

Acceleration

- ◆ A car's speed increases from 30 km/hr to 60 km/hr in 5 sec. What is its acceleration?

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Acceleration

- ◆ A runner starts from rest and reaches a speed of 6 m/s in 2 sec. What is his acceleration?

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Acceleration

- ◆ A car starting from rest reaches a speed of 40 km/hr in 2 sec. What is its acceleration?

A photograph of the Golden Gate Bridge at night, with the bridge's towers and suspension cables silhouetted against a dark blue sky. The bridge spans across a body of water, and the overall scene is dimly lit, creating a moody atmosphere.

Acceleration

- ◆ A car traveling 60 km/hr stops in 3 sec. What is its acceleration?

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Acceleration

- ◆ A car starts from rest and reaches a speed of 125 km/hr in 5 sec. What is its acceleration?