



## The Speed of Light Lesson Plan

**Time:** 40 minutes

**Goals:** To gain an understanding of the history of speed, the relativity of speed, and how we measured the speed of light.

**Objectives:** Students will:

- Watch the “Speed of Light” segment of the “How fast is it” video book
- Take a short quiz

**Materials:**

- Internet connection with a computer for viewing [“The Speed of Light” segment on YouTube](#)

**Directions:**

- Introduce the ‘Speed of Light’ segment as an introduction to how fast things can go; how speed is actually relative; and how the speed of light is a constant.
- Show the video.
- Review what they saw:
  - How we compared the speed limits for land, air, and outer space.
  - How Galilean transformations are used to compute relative speeds.
  - How the speed of light was actually measured for the first time.
  - And how Michelson and Morley used an interferometer to show that the speed of light was a constant for all observers.

**Assessment:**

Take a simple quiz. Print and distribute the quiz on page 2. Here are the answers:

- What do Galilean Transformations transform?  
**Answer:** b) Velocity in one frame of reference to another
- How far will light travel in one second?  
**Answer:** a) 300,000 km (or 186,000 miles)
- Interferometers can measure very small differences in what?  
**Answer:** d) The length traveled by two waves



## The Speed of Light quiz

- What do Galilean Transformations transform?
  - Speed into velocity
  - Velocity in one frame of reference to another
  - Cartesian to polar coordinates
  - Motion into rest
  
- How far will light travel in one second?
  - a) 300,000 km (or 186,000 miles)
  - b) 300 million km (or 186 million miles)
  - c) 300 km or (186 miles)
  - d) 3 km (or 1,86 mile)
  
- Interferometers can measure very small differences in what?
  - a) The amplitude of two waves
  - b) The temperature of two waves
  - c) The frequency of two waves
  - d) The length traveled by two waves

