



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

