



Special Relativity Lesson Plan

Time: 40 minutes

Goals: To gain an understanding of space-time and why the fact that the speed of light is a constant means that across reference frames: time slows down, space contracts and simultaneity is impossible.

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 [“Special Relativity” segment on YouTube](#)

Directions:

- Introduce the ‘Special Relativity’ segment as an introduction to how nature behaves across frames of reference that are moving at different speeds.
- Show the video.
- Review what they saw:
 - How a light clock works.
 - How Lorentz transformations are used to add velocities.
 - How Special Relativity eliminates simultaneity.
 - What a light cone is in space-time.

Assessment:

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

- How would you see a clock ticking in another frame of reference?
Answer: c) It ticks slower than yours
- When you add the speed of light to the speed of this other moving reference frame, what do you get?
Answer: a) The speed of light
- What do the 4 coordinates of an event in space-time represent?
Answer: c) The time and place an event occurred



Special Relativity quiz

- How would you see a clock ticking in another frame of reference?
 - a) It ticks at the same rate as yours
 - b) It ticks faster than yours
 - c) It ticks slower than yours
 - d) It does not tick at all

- When you add the speed of light to the speed of this other moving reference frame, what do you get?
 - a) The speed of light
 - b) The speed of light minus the speed of the reference frame
 - c) The speed of light plus the speed of the reference frame
 - d) the speed of the reference frame

- What do the 4 coordinates of an event in space-time represent?
 - a) The time the event occurred
 - b) The place an event occurred
 - c) The time and place an event occurred
 - d) The distance between two points



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