

CHAPTER OVERVIEW

15: Special Relativity

The phrase “special” relativity deals with the transformations between reference frames that are moving with respect to each other at constant relative velocities. Reference frames that are accelerating or rotating or moving in any manner other than at constant speed in a straight line are included as part of general relativity and are not considered in this chapter.

- 15.1: Introduction to Special Relativity
- 15.2: Preparation
- 15.3: Preparation
- 15.4: Speed is Relative - The Fundamental Postulate of Special Relativity
- 15.5: The Lorentz Transformations
- 15.6: But This Defies Common Sense
- 15.7: The Lorentz Transformation as a Rotation
- 15.8: Timelike and Spacelike 4-Vectors
- 15.9: The FitzGerald-Lorentz Contraction
- 15.10: Time Dilation
- 15.11: The Twins Paradox
- 15.12: A, B and C
- 15.13: Simultaneity
- 15.14: Order of Events, Causality and the Transmission of Information
- 15.15: Derivatives
- 15.16: Addition of Velocities
- 15.17: Aberration of Light
- 15.18: Doppler Effect
- 15.19: The Transverse and Oblique Doppler Effects
- 15.20: Acceleration
- 15.21: Mass
- 15.22: Momentum
- 15.23: Some Mathematical Results
- 15.24: Kinetic Energy
- 15.25: Addition of Kinetic Energies
- 15.26: Energy and Mass
- 15.27: Energy and Momentum
- 15.28: Units
- 15.29: Force
- 15.30: The Speed of Light
- 15.31: Electromagnetism

This page titled [15: Special Relativity](#) is shared under a [CC BY-NC 4.0](#) license and was authored, remixed, and/or curated by [Jeremy Tatum](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.