

CP1 & honors
(not AP®)

Introduction: Special Relativity

Unit: Special Relativity

Topics covered in this chapter:

Speed of Light	554
Length Contraction & Time Dilation	558
Energy-Momentum Relation	564

This chapter describes changes to the properties of objects when they are moving at speeds near the speed of light.

- *Relative Motion* and *Relative Velocities* describes relationships between objects that are moving with different velocities.
- *Speed of Light* describes some familiar assumptions we have about our universe that do not apply at speeds near the speed of light.
- *Length Contraction & Time Dilation* and the *Energy-Momentum Relation* describe calculations involving changes in the length, time, mass, and momentum of objects as their speeds approach the speed of light.

New challenges in this chapter involve determining and understanding the changing relationships between two objects, both of which are moving in different directions and at different speeds.

Standards addressed in this chapter:

Massachusetts Curriculum Frameworks/Science Practices (2016):

No MA curriculum frameworks are addressed in this chapter.

AP® Physics 1 Learning Objectives/Essential Knowledge (2024):

No AP® Physics 1 learning objectives are addressed in this chapter.

Skills learned & applied in this chapter:

- keeping track of the changing relationships between two objects