

CHAPTER OVERVIEW

1: Waves in One Dimension

The wave is a universal phenomenon which occurs in a multitude of physical contexts. The purpose of this section is to describe the *kinematics* of waves, i. e., to provide tools for describing the form and motion of all waves irrespective of their underlying physical mechanisms.

Many examples of waves are well known to you. You undoubtedly know about ocean waves and have probably played with a stretched slinky toy, producing undulations which move rapidly along the slinky. Other examples of waves are sound, vibrations in solids, and light.

In this chapter we learn first about the basic properties of waves and introduce a special type of wave called the sine wave. Examples of waves seen in the real world are presented. We then learn about the superposition principle, which allows us to construct complex wave patterns by superimposing sine waves. Using these ideas, we discuss the related ideas of beats and interferometry. Finally, the ideas of wave packets and group velocity are introduced.

[1.1: Transverse and Longitudinal Waves](#)

[1.2: Sine Waves](#)

[1.3: Types of Waves](#)

[1.4: Superposition Principle](#)

[1.5: Beats](#)

[1.6: Interferometers](#)

[1.7: Thin Films](#)

[1.8: Math Review — Derivatives](#)

[1.9: Group Velocity](#)

[1.10: Problems](#)

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