

1-Dimensional Waves Skill Objectives

What you should know and be able to do by the end of the unit:

1. Illustrate the concept of wave propagation using coupled oscillating particles

- Show how a disturbance can be propagated.
- Examine factors that might affect the speed of propagation.
- Introduce terms - transverse and longitudinal

2. Demonstrate the behavior of wave pulses

- Show that the speed of pulses through a medium is constant.
- Determine the speed of a pulse through a medium.
- Examine the movement of a particle in the medium.
- Determine how the speed of a pulse is affected by changes in amplitude, pulse length, type of pulse, tension, or inertial properties (linear density) of the medium.
- Show that waves transfer energy without the accompanying transfer of matter.

3. Demonstrate the behavior of transverse pulses in springs interacting with a boundary.

- Show reflection of a single pulse on a spring from a fixed end and a free end.
- Show reflection and transmission of a single pulse as it passes from one medium into another, through a density boundary.

4. Examine the interaction of multiple pulses traveling on a spring

- Apply the principle of superposition to two pulses that meet in a medium.
- Understand constructive interference and destructive interference as superposition examples.

5. Demonstrate the characteristics of periodic waves

- Demonstrate and give examples of how disturbances in a medium produce periodic waves.
- Introduce and develop a wave vocabulary.
- Explain how the frequency of mechanical wave is determined by the source, not the medium.
- Show how periodic waves in a finite medium produce standing waves
- Determine the relationships among frequency, wavelength and velocity using both graphical and mathematical representations.
- Quantify/qualify the effects of the elastic and inertial properties of a medium on the speed of propagation of a wave.

• Additional Study Hints

Look over all of our activities, worksheets, and questions of the day.
Form a study group and review together and quiz each other.