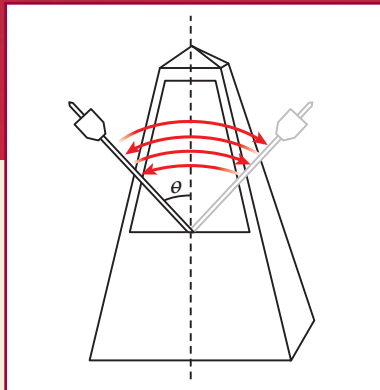


Vibrations and Waves



A mechanical metronome consists of an inverted pendulum and a counterweight on opposite sides of a pivot. A sliding weight above the pivot is used to change the rate of vibration. As the pendulum vibrates, the metronome ticks, and musicians use the sound to keep a steady tempo. This vibration is an example of a *periodic motion*.

WHAT TO EXPECT

In this chapter, you will study a kind of periodic motion called *simple harmonic motion* and will learn about the relationship between simple harmonic vibrations and waves.

Why it Matters

Waves can carry information, such as conversations and television broadcasts. Much of your perception of the physical world is dependent on waves. You could not hear or see anything without sound waves and light waves.

CHAPTER PREVIEW

1 Simple Harmonic Motion

- Hooke's Law
- The Simple Pendulum

2 Measuring Simple Harmonic Motion

- Amplitude, Period, and Frequency

3 Properties of Waves

- Wave Motion
- Wave Types
- Period, Frequency, and Wave Speed

4 Wave Interactions

- Wave Interference
- Reflection
- Standing Waves