

Lesson Outline**LESSON 3****Using Electromagnetic Waves****A. How do you use electromagnetic waves?**

1. There are few things you do that do not involve _____ waves.
2. Uses include using _____ waves in your clock radio and _____ when you pick out your clothes.

B. Radio Waves

1. Radio and _____ stations send out signals using radio waves.
2. Radio waves are used in _____, which is the use of electromagnetic waves to send information in all _____.
3. A simple radio wave is _____ by a station so the wave can carry information.
 - a. A(n) _____ wave is an electromagnetic wave that a radio or television station uses to carry sound or _____ signals.
 - b. A station converts sounds or images into a(n) _____ that produces a carrier wave.
4. A station must _____, or vary, the carrier wave to match the signals.
 - a. _____ (AM) is a change in the amplitude of a carrier wave.
 - b. _____ (FM) is a change in the frequency of a carrier wave.
5. In a(n) _____ signal, the wave changes smoothly from high to low, but in a(n) _____ signal, the changes occur in steps.
6. A(n) _____ at a radio station sends out signals, and a(n) _____ receives them and changes them back to sound.
7. _____ signals travel farthest and move around objects better than _____ signals because of their long wavelength.

C. Microwaves

1. Microwaves are used to heat _____ and are useful for _____ and _____ signals.
2. Microwaves can carry _____ information than radio waves because their wavelength is _____.

Lesson Outline continued

3. A(n) _____ sends microwave signals to a satellite, which can then pass the signal to other satellites.
4. The _____ is a worldwide navigation system that uses satellite signals to determine the _____ of the receiver.

D. Infrared Waves

1. The warmer an object is, the more _____ waves it emits.
2. _____ cameras take pictures by detecting infrared waves and converting different _____ to different colors.
3. These images are used in medicine, _____ goggles, and _____ images of Earth.

E. Light

1. The _____ provides most of Earth's light.
2. Uses of light include _____ lights and communication that travels through _____ fibers.

F. Ultraviolet Waves

1. Certain materials are useful because they _____ when they are struck by ultraviolet waves.
2. Ultraviolet waves are also useful because they kill _____, control or cure _____ problems, and harden dental _____.
3. _____ lightbulbs use the energy from ultraviolet waves to produce light.

G. X-Rays

1. X-rays are useful in _____ scanning because they are used with _____ to form images of what is in luggage.
2. X-rays have medical uses because they pass through _____ parts of the body, but _____ stop them.

H. Gamma Rays

1. Gamma rays can destroy _____ tissue in a patient.
2. They can also be used in a(n) _____ scan to diagnose medical conditions.