Quiz.

1. Light from a vacuum passing through a non-vacuum medium
   a. speeds up.
   b. slows down.
   c. does not change speed.

2. Which types of EM radiation have the shortest wavelength?
   a. radio waves
   b. UV rays
   c. gamma rays
   d. infrared light
   e. x-rays

3. Glass is _____ to visible light.
   a. transparent
   b. opaque

4. Glass is _____ to UV light.
   a. transparent
   b. opaque

5. What part of our eyes allows us to see color?
   a. cornea
   b. rods
   c. cones
   d. blind spot

6. The retina contains the eye's rods and cones. The cones are concentrated at the
   a. cornea.
   b. fovea.
   c. iris.
   d. blind spot.

7. What produces an EM wave? (Circle all that apply.)
   a. stationary electric charges
   b. oscillating electric charges
   c. oscillating electric and magnetic fields

8. Which type of EM radiation travels the fastest?
   a. radio waves
   b. gamma rays
   c. x-rays
   d. all EM radiation travels at the speed of light

9. Light from a relatively small source obeys the inverse square law.
   a. True
   b. False

Answer Key.
1. b)

Nothing can travel faster than light in “free space,”. However, light does slow down in a transparent medium.

2. c)

Gamma rays have the shortest wavelength, while radio waves have the longest.

3. a)

We can tell that glass is transparent to visible light because we can see through it.

4. b)

Although we cannot see ultraviolet radiation without scientific instruments, we know that glass does not allow UV rays to penetrate because it protects us from sunburn.

5. c)

Our rods allow us to detect lightness and darkness. Our cones allow us to detect color, and there are three types of cones which are stimulated by low-, mid-, and high-frequency light.

6. b)

Our retinas contain our rods and cones, with a concentration of rods in the periphery of the retina and a concentration of cones in the fovea, which is also located on the retina.

7. b) & c)

Stationary electric charges may produce electric fields, but not magnetic fields. Moving electric charges and electrical currents produce both electric and magnetic fields. Electromagnetic waves are caused by the oscillation of both magnetic and electric fields.

8. d)

While some electromagnetic radiation carries higher energy than others, all electromagnetic radiation propagates at the same speed in the same material.

9. a)

The amount of light per surface *area* is inversely proportional to its distance from the source.