

## Create Your Own Spectroscope Answer Key

*What differences or similarities did you notice between the spectrum of the light sources you chose?*

Answers will vary depending on the light source. Here are some points to look for. Sunlight will have a continuous spectrum. There will be no gaps and students will see a full rainbow. Fluorescent light bulbs will have a spectrum that show all the colors in distinct lines, they do not blend together or connect. Incandescent bulbs will also show a continuous spectrum of the colors of the rainbow.

*What is acting as the diffraction grating in the spectroscope you created? How does it work?*

The CD. This works because the shiny side of the CD has many small concentric circles going out from the center. The light from the viewing slit bounces off all of these grooves acting as the slits in a standard diffraction grating.

*Name other wavelengths of light that are invisible to humans. How do humans use these kinds of light?*

Gamma, x-rays, ultraviolet, infrared, microwave, radio. Microwaves aren't seen in the image in the introduction paragraph because scientists often lump microwave and radio waves together.

We use microwaves to heat food, radio waves for entertainment, x-rays are used in medicine, infrared is used in night vision goggles to see heat signatures, and ultraviolet light is what causes sunburn.

*What information do scientists get from a spectrophotometer?*

Scientists see the absorption spectrum of a sample when using a spectrophotometer. That means the sample absorbed some of the wavelengths of light. Different elements absorb different wavelengths. This tells scientists the elements that make up the sample.

*How does the spectrum from a spectrophotometer differ from the ones you saw in your spectroscope?*

The spectrum from a spectroscope is an emission spectrum. You see the light coming from the sample because it is emitting it. On the other hand, a spectrophotometer takes light, and sends it through a sample. You see the light that goes through the sample, not the light that comes from it. The spectrophotometer generates absorption spectrum, while the spectroscope generates emission spectrum.