Science 8 Optics and Vision Unit

Big Idea: How do we see?

Outcome:

OP8.4 Evaluate the impact of electromagnetic radiation-based technologies on self and community.

Understandings:

Electromagnetic radiation has many differing characteristics.

Visible light has many unique properties.

There are instruments that emit, detect and incorporate electromagnetic radiation.

Essential questions:

1. What are the characteristics of electromagnetic radiation?
2. What are the characteristics of visible light?
3. What instruments can emit, detect and incorporate electromagnetic radiation? How is electromagnetic radiation part of our world?

Students need to know:

* Vocabulary – wavelength, frequency, energy, radiation, electromagnetic, infrared, ultraviolet, X-rays, microwaves, radio waves,
* Properties of visible light e.g., relative energy, frequency, wavelength, and human perception
* Instruments that **emit or detect** different types of electromagnetic radiation e.g., cordless phone, cell phone, GPS, wireless computer network, black light, X-ray photographic film, radio, and thermal imaging camera
* Technology that **incorporates** electromagnetic radiation e.g., microwave oven, solar cooker, sun tanning lamp, infrared heat lamp, radio, medical imaging X-ray, blacklight, UV fire detector, night vision goggles, infrared thermography, and radar

And be able to: (essential questions they are related to are in brackets)

-describe the characteristics of electromagnetic radiation (1)

-describe the characteristics of visible light and compare it to other types (1, 2)

-provide examples of uses of instruments that emit, detect and incorporate electromagnetic

radiation (3)

-analyze the design and function of electromagnetic technologies (3)

-defend a position related to the impact of electromagnetic technology on self & community (3)

-identify questions and problems that arise from these technologies (3)