

**Student Discussion Worksheet****Directions:****Properties of electromagnetic radiation**

Watch NASA's "[Introduction to the Electromagnetic Spectrum](#)," and answer the following prompts with a partner. Make sure you discuss the relationships between properties of electromagnetic radiation with your partner. Use additional resources if necessary. For instance, you could look up a diagram of the spectrum, such as [this one provided by NASA](#).

1. Define the following terms:

Electromagnetic radiation (make sure to include the name of each type):

Wavelength (and an appropriate unit used to measure it):

Frequency (and an appropriate unit used to measure it):

The speed of light (and an appropriate unit used to measure it):

2. Are the wavelength and frequency of electromagnetic waves directly or inversely related? Explain.

3. Are the frequency and energy of electromagnetic waves directly or inversely related?

4. Based on your answers to questions No. 2 and No. 3, what is the relationship between electromagnetic waves' wavelength and energy?

5. To better understand how different types of electromagnetic radiation relate to each other, rank gamma rays, infrared, ultraviolet and radio waves in order of increasing:

Wavelength

Frequency

Energy

6. What property is the same across all types of electromagnetic radiation in a vacuum?

### **Applications of technology using electromagnetic radiation**

With your partner, choose a type of electromagnetic radiation and research a technology that uses that specific type of radiation. Then, answer the questions below using NASA's "[Tour of the Electromagnetic Spectrum](#)" and outside resources if necessary. The [Science News archive](#) is one of many useful resources. Use your answers to give a brief presentation on the technology to your classmates.

1. Does the video mention a technology you already knew about that uses electromagnetic radiation? Is there an application of that technology that was new to you, or surprised you? Explain.

2. Choose a type of electromagnetic radiation that you and your partner wish to explore and find a technology that uses this type of radiation. What is the technology called? What type of electromagnetic radiation does it use?

3. What is the goal or purpose of the technology?

4. Explain how the technology uses electromagnetic radiation.

5. Can this technology use only one type of electromagnetic radiation? Explain why or why not.

6. What are some other technologies that use your chosen type of electromagnetic radiation?