



**Instructor:** Esther Yaeger (2003 Science Teacher Workshop participant)

**School District:** East Brunswick

**Lesson Title:** Radiation and The Electromagnetic Spectrum

**Grade:** 9

**Subject:** Physical Science

**Overview:** Student groups will research a specific electromagnetic wave on the web and then report their information in the assigned format to the class on a poster board. All the groups together will make a continuous EM spectrum. Students will learn the difference between radiation and radioactivity.

**Objectives:**

1. SWBAT identify the type of electromagnetic wave by wavelength and frequency
2. SWBAT describe the amount of energy in each type of wave by demonstrating with a slinky.
3. SWBAT list uses for each type of wave
4. SWBAT describe risk factors and benefits (if any) for each type of wave
5. SWBAT identify alpha, beta and gamma radiation
6. SWBAT compare and contrast radiation and radioactivity

**Materials and Resources:**

- use of computers for research
- poster board
- Fact sheets 1 and 2

**Activity:**

1. Teacher will introduce the electromagnetic spectrum and describe the different types of waves – Radio, Microwave, Infrared, Visible Light, UV waves, X-rays and Gamma Rays in terms of wavelength and frequency.
2. Student groups will research the following for each type of wave:
  - Name of Wave:
  - Wavelength:
  - Frequency (speed)
  - Energy (kilojoules)
  - Uses
  - Benefits
  - Risk Factors (if any)

- Sources
  - Current Events
3. Students will place information on poster boards, drawing the wavelength to a scale. Poster boards will be connected on a bulletin board according to decreasing wavelength and increasing frequency to make a continuous spectrum. Each group will discuss their wave with the class and present the information. Pictures and creativity will count in the preparation of their poster
  4. The entire class will fill in all information on their prepared note sheets.
  5. Class discussion of radiation and radioactivity, including alpha, beta and gamma rays.