

**➤ Main Ideas, Key Points, Questions:**

*After watching the video segment, write down key points, main ideas, and big questions.*

**➤ Objective(s):**

- *Understand how electromagnetic waves are created, and the evidence for the wave and particle properties for these waves.*
- *Recognize the different types of electromagnetic waves, and how they differ with regards to frequency and wavelength.*

**➤ Notes:**

*During the video segment, use words, phrases, or drawings to take notes.*

**➤ Summary:**

*After watching the video segment, write at least three sentences explaining what you learned. You may ask yourself: "If I was going to explain this to someone else, what would I say?"*

**Answer the following.**

1. What are the two fields that electromagnetic waves are comprised of?

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2. How do electromagnetic waves differ from mechanical waves?

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3. Define a photon in your own words.

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4. What happens when electrons are excited to higher energy levels, and then fall back to a lower, more stable energy level?

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5. What was Einstein's hypothesis that provided evidence for the particle nature of light called?

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6. Complete the following table:

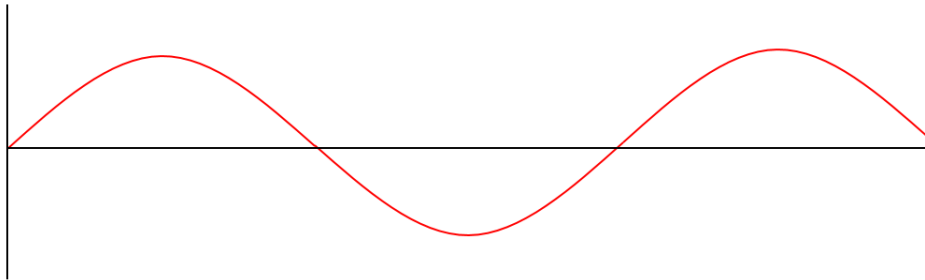
Phenomenon	Can be explained by wave nature	Can be explained by particle nature
Reflection		
Refraction		
Interference		
Diffraction		
Photoelectric Effect		

Answer the following.

7. What kind of waves are electromagnetic waves?

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8. On the diagram below, label a crest, trough, and wavelength:



9. Light travels at a constant speed. So, if the frequency of light increases, what happens to the wavelength of light?

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10. Write the wave speed equation for light below:

11. What is the rounded speed of light in a vacuum in meters per second?

**Answer the following.**

12. List a use or property for each type of electromagnetic waves, from lowest to highest frequency:

Radio waves: \_\_\_\_\_

Microwaves: \_\_\_\_\_

Infrared: \_\_\_\_\_

Visible Light: \_\_\_\_\_

Ultraviolet Light: \_\_\_\_\_

X-rays: \_\_\_\_\_

Gamma Rays: \_\_\_\_\_

13. What color of visible light has the lowest frequency?

\_\_\_\_\_

14. What color of visible light has the highest frequency?

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