

Note Taking Guide - Episode 1302 - Part 1

Evidence for **wave** nature of light:

- 1.
- 2.
- 3.

Evidence for **particle** nature of light:

1. photoelectric effect - _____ produces _____
 - When certain frequencies of light shine on a metal surface, - _____ are ejected.
 - uses:
 - experimental results:

FACTS

Violet and UV light _____ejects electrons, but red light _____ works.

When the photoelectric effect occurs, it does so _____. There is never a _____ delay, even with the _____ light.

Bright light ejects _____ electrons, but their _____ depends on the _____ of light, not the _____.

- The wave theory _____ to explain the photoelectric effect.

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Quantum Theory

- Energy is _____ and _____ in tiny, indivisible bundles.
- Each packet of energy is called a _____.
- A quantum of light energy is called a _____.
- The energy of a photon of light depends on the _____ of light.

$$E = hf$$

↙ _____ constant

_____ used the quantum theory to explain the photoelectric effect.

- Light consists of _____, each having a certain amount of energy depending on its _____. ($E = hf$)
- Each _____ can absorb a single photon of light.
- An electron needs a certain amount of _____ to jump out of the atom.
- If the _____ can furnish enough energy, the electron will be ejected.
- If it furnishes more energy than the electron needs to escape, it will give the electron more _____ and make it move faster.

More evidence for **particle** nature of light:

2.

3.

Modern light theory: Wave-Particle _____.

Light moves through space as a _____ and interacts with matter as a _____.