Photoelectric Effect (4)

Summary of Results:

- Electron energy depends on frequency, not intensity.
- Electrons are not ejected for frequencies below f_0.
- Electrons have a probability to be emitted immediately.

Conclusions:

- Light arrives in "packets" of energy (photons).
- $E_{photon} = hf$ ← We will see that this is valid for all objects. It is the fundamental QM connection between an object's wave and particle properties.
- Increasing the power increases # photons, not the photon energy. Each photon ejects (at most) one electron from the metal.

Recall: For EM waves, frequency and wavelength are related by: $f = c/\lambda$.
Therefore: $E_{photon} = hc/\lambda$

Beware: This is only valid for EM waves,
as evidenced by the fact that the speed is c.