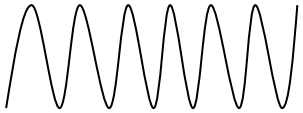
PE Effect: Light is a wave – right?

Accepted Wave theory: Increasing the amplitude of a wave increases its energy.

Wave

result of increase amplitude



Sound = louder & more energy

Water wave = higher & more energy

Light = brighter & more energy (*transparent/translucent filters)

Experiments

Sketch the set up with appropriate details. (previously done) **Record** what happens.

(1) PE Effect:

50% intensity - Physicists couldn't see electrons. So what did they observe??
Blue light _____ Red light _____

Explain the difference.

_____

(2) Focus on Red Light

According to current wave theory, what could be done?

Predict: _____

Observe: _____

Explain: _____

(3) What's next logically? – keep @ 50%

_____

Predict: _____

Observe: _____

Explain: _____

(4) Now let's increase the amplitude

We know that energy is conserved. This law always holds true. Using this:

Predict: _____

Observe: _____

Explain: _____

(5) Now let's find out how much Ek the electron has. My negatively charging the receiving plate, the electron will be repelled from it. If the electron has enough Ek, it will arrive and if the ΔV is too large, it won't arrive there.
Let's start with 0V and current and increase the ΔV until the current *just* stops. Now the Ee (Ee = qΔV) is equal to the initial Ek of electron. Use 50% intensity.

Predict: _____

Observe: _____

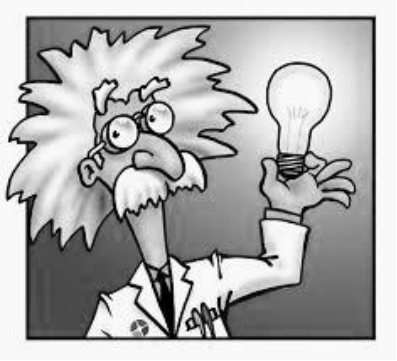
Explain _____

Now let's increase the intensity. Use classic λ theory to predict results

Predict: _____

Observe: _____

Explain _____



Einstein says:

Energy conservation says:

Now let's change the metal cathode

Predict: _____

Observe: _____

Explain: _____

W_o = _____

Formula: