Quantum Mechanics	PH112
Quantum theory - describes physics on a microscopic latomic scale	
Photoelectric effect when light is incident on certain metallic surfaces, electrons are	
emitted from the surface Current High intensity Low intensity Applied voltage Wave theory does not explain photoelectric	
red ~ No blue m Yes, low KE Small 2 -> high v uv mm Yes, high KE	
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And the second contract to the second	
Light consists of a beam of small particals that is directly proportional to frequence	Υ:
Ephi hf = Ebinding + KEel KE	
Planck's constant = 6.6×10-34 Js	
KEel=Eph-D=hf-D KE~hf 2Cutoff frequency= h	
- Work function	
Example #1	
V=4.6×10 m/s KE=hf-0 0=hf-KE	
7=625nm=6.25×10-7m hf=6.6×10-34(4.8×10-14)=3.2×10-19 J	
$\phi = ? f_c = ?$ $c = \lambda f f = \frac{c}{\lambda} = \frac{3 \times 10^{8}}{6.25 \times 10^{-7}} = 4.8 \times 10^{14} \text{ Hz}$	
$KE = \frac{1}{2}mv^2 = \frac{1}{2}(9.1 \times 10^{-31})(4.6 \times 10^{5})^2 = 9.6 \times 10^{-20}$	
$\phi = 3.2 \times 10^{-19} - 9.6 \times 10^{-26} = 2.2 \times 10^{-19} $ = 1.4 eV	
$f_c = \frac{\delta}{h} = \frac{1.2 \times 10^{-14}}{6.6 \times 10^{-34}} = 3.3 \times 10^{14} \text{ Hz}$	
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1eV=1.6×10-19J	
Photocell-current produced when light of high frequency falls on the cell	

A beam of light behaves like a wave A single photon behaves like a particle