

$c = f\lambda$   
 $E = hf$

$A \rightarrow B$   
 ①  $f \uparrow$   
 ②  $\lambda \downarrow$  , More waves / sec. More E!

Oct 26-9:31 AM

Planck's  $E = hf$

$E = \frac{hc}{\lambda}$  ✓

$h = 6.63 \times 10^{-34} \text{ J} \cdot \text{sec}$

$E = hf$

$\frac{\text{J}}{\text{sec}} = \frac{\text{J} \cdot \text{sec}}{1} \times \frac{1}{\text{sec}}$

$\frac{\text{J}}{\text{sec}} \div \frac{1}{\text{sec}}$

$\frac{\text{J}}{1} \times \frac{\text{sec}}{\text{sec}} = \text{J} \cdot \text{sec}$

$c = f\lambda$   
 $f = \frac{c}{\lambda}$

Oct 26-9:37 AM

$E = hf$        $E = mc^2$

$hf = mc^2$

$\frac{hc}{\lambda} = \frac{mc^2}{1}$

$\frac{h\nu}{\lambda} = \frac{Mv^2}{1}$

$\frac{h\nu}{Mv^2} = \frac{\lambda}{1}$

$\frac{h}{Mv} = \frac{\lambda}{1}$

$\lambda = \frac{h}{Mv}$

**SOLVE FOR  $\lambda$**

$c = 3 \times 10^8 \text{ m/sec}$   
Speed of light  
 $\rightarrow v = \text{generic velocity}$

$\left( \frac{1}{\lambda} \times v = \frac{1}{\lambda} \right)$

**DeBroglie Wavelength**

$\lambda$  (meters)

$M$  (kg)

velocity  $\frac{m}{sec}$

Oct 26-9:38 AM

$C = f\lambda$

$E = hf$

$\lambda = \frac{h}{Mv}$

$E = \frac{hc}{\lambda}$

Excited  $\rightarrow$   $E$

ground

$\frac{1}{sec}$

$\frac{m}{sec}$

kg

Oct 26-9:50 AM

100mph, SO<sub>2</sub>,  $\lambda = \text{---} \text{m}$

SO <sub>2</sub>	1 pound	0.454 Kg	= $\frac{m}{\text{mass}}$	$\lambda = \frac{h}{mV}$
	16.02	1 pound		

100 miles	1 hr	1 min	5280 ft	1 yd	1 m	= $\frac{v}{\text{velocity}}$
hr	60 min	60 sec	1 mile	3 ft	1.094 yd	

$$\lambda = \frac{h}{mV} = 1.04 \times 10^{-27} \text{ m}$$

Oct 26-9:56 AM