

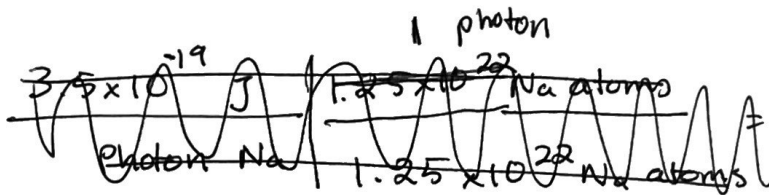
Problem 14

HW 4

$\underline{0.458} \text{ mg} \rightarrow 0.458 \text{ g Na} = 23 \text{ g/mol}$

0.0458 g Na	1 mol Na	$6.022 \times 10^{23} \text{ atoms Na}$
	22 g Na	1 mol Na

~~1.25×10^{22}~~ Na atoms $\Rightarrow 1.25 \times 10^{21}$



$3.5 \times 10^{-19} \text{ J}$	$1.25 \times 10^{22} \text{ Na atoms}$	
photon Na		$= 4375$

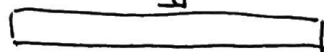
$420 \text{ J} \approx 438.6$

Problem 15

$\frac{1.05 \text{ eV}}{1 \text{ eV}} \left| \frac{1.6022 \times 10^{-19} \text{ J}}{1 \text{ eV}} \right.$

$324 \text{ nm} = \lambda$

$\Phi = 1.05 \text{ eV} \Rightarrow 1.68 \times 10^{-19} \text{ J}$



$c = \lambda \cdot \nu$

$\frac{1}{2} m_e v^2 = h\nu - \Phi$

$\frac{3.00 \times 10^8 \frac{\text{m}}{\text{s}}}{324 \times 10^{-9} \text{ m}} = \frac{324 \times 10^{-9} \text{ m} \cdot \nu}{324 \times 10^{-9} \text{ m}}$

$\nu = 9.259 \times 10^{14} \text{ s}^{-1}$

Problem 15 continued

$$324 \text{ nm} = \lambda$$

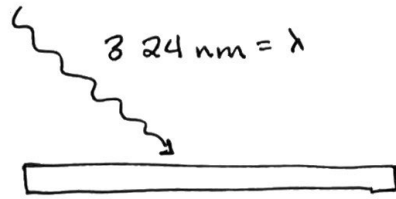
$$3.00 \times 10^8 \frac{\text{m}}{\text{s}} = c$$

$$9.259 \times 10^{14} \frac{1}{\text{s}} = \nu$$

$$1.05 \text{ eV} = \Phi \Rightarrow 1.68 \times 10^{19} \text{ J}$$

$$6.626 \times 10^{-34} = h$$

$$9.11 \times 10^{-31} \text{ kg} = m_e$$



$$\frac{1}{2} m_e v_e^2 = h \nu - \Phi$$

Problem 16

Problem 3

$$4.11 \times 10^{-7} \text{ m}$$

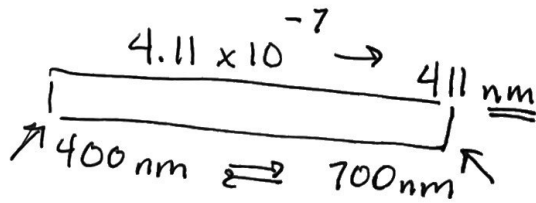
$$411 \times 10^{-9} \text{ nm}$$

$$\boxed{411 \text{ nm}}$$

mm
nm
pm

$$\left[\begin{array}{l} 320 \text{ nm} \\ 3.20 \times 10^{-9} \end{array} \right]$$

$$3.20 \times 10^{-7} \uparrow \text{ Bigger}$$



~ 400 nm Blue light!!

Problem 4

$$\begin{array}{l} 1.52 \times 10^{-11} \text{ m} \\ 15.2 \times 10^{-12} \end{array}$$

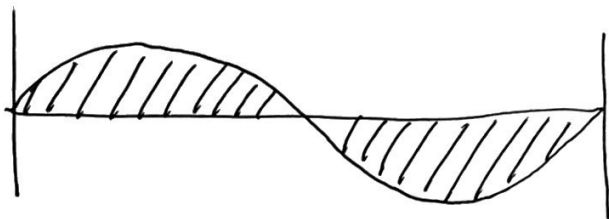
$$\begin{array}{l} 0.0152 \times 10^{-9} \\ \boxed{0.0152 \times 10^{-9}} \\ \text{Bigger} \end{array}$$

$$\begin{array}{l} 0.000000000 \times 10^{-9} \\ 0.000000000000 \times 10^{-11} \end{array}$$

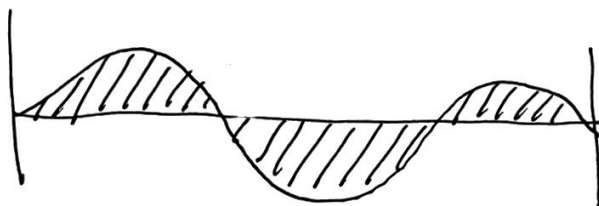
0.0152 nm ← not answer choice
15.2 pm ← answer choice?



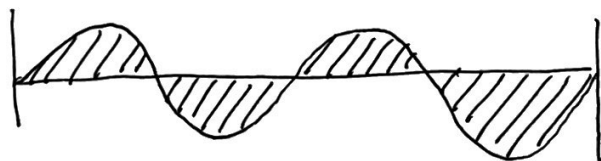
$n = 1$
nodes = 0
 $n = \#$ of "humps"



$n = 2$
nodes = 1



$n = 3$
nodes = 2



$n = 4$

nodes

$n - 1 = \#$ of nodes