

Flame lab

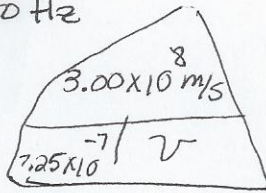
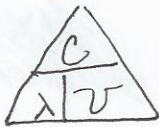
① $\lambda \uparrow \nu \downarrow$ look for lower frequency
 $= 6.01 \times 10^{14} \text{ Hz}$

② $E \uparrow \lambda \downarrow$ look for shorter wavelength
~~674 nm~~ 480 nm

③ ROY G B I V
 low \longrightarrow high frequency
 Indigo has higher frequency

④ ^{1st} need to convert so both have same unit to compare

Either A Convert 725 nm to Hz



$\nu = 4.14 \times 10^{14} \text{ Hz}$ compare to $4.28 \times 10^{14} \text{ Hz}$

$E \uparrow \nu \uparrow$ look for higher frequency
 answer = $4.28 \times 10^{14} \text{ Hz}$

Convert 725 nm \rightarrow m b/c speed of light unit

$\frac{725 \text{ nm}}{1 \times 10^9 \text{ nm}} = 7.25 \times 10^{-7}$

OR B convert both to 4.28×10^{14} to wavelength

$\frac{3.00 \times 10^8}{\lambda / 4.28 \times 10^{14}} = 7.01 \times 10^{-7} \text{ m}$
 Convert to nm

$\frac{7.01 \times 10^{-7} \text{ m}}{1 \times 10^{-9} \text{ nm}} = 701 \text{ nm}$

Now compare 725 nm to 701 nm $E \uparrow \lambda \downarrow$ look for shortest wavelength
 $= 701 \text{ nm}$ hence $4.28 \times 10^{14} \text{ Hz}$ frequency

⑤ $\frac{3.00 \times 10^8}{\lambda / 5.21 \times 10^{14}} = 5.76 \times 10^{-7} \text{ m}$
 Convert to nm

$\frac{5.76 \times 10^{-7} \text{ m}}{1 \times 10^{-9} \text{ nm}} = 576 \text{ nm}$

* now look at table on lab = yellow

⑥ $\frac{3 \times 10^{10}}{5.4 \times 10^{-5}} = 5.6 \times 10^{14} \text{ Hz}$

* $3.00 \times 10^{10} \text{ cm/s}$ notice your wavelength is in cm

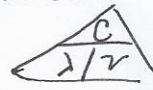
Remember

$E \uparrow \nu \uparrow$ direct

$\lambda \downarrow \nu \uparrow$ inverse

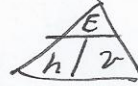
$E \uparrow \lambda \downarrow$ inverse

$C = \lambda \nu$



$C =$ speed of light
 $3.00 \times 10^8 \text{ m/s}$ OR
 $3.00 \times 10^{10} \text{ cm/s}$

$E = h \nu$



$\lambda =$ wavelength $\frac{\text{m}}{\text{nm}}$

$\nu =$ frequency Hz or $\frac{1}{\text{sec}}$ or sec^{-1}

$E =$ energy J

$h =$ plank's constant $6.626 \times 10^{-34} \text{ J}\cdot\text{s}$