Name: _____   **Period:** _____   **Seat#:** _____

Directions: Try these problems. If you can DO them, check the box (☑).
If you CANNOT do them, write some notes TO YOURSELF about what you need to study to succeed at these problems.

Formulas and Constants					
$c = \lambda \upsilon$	$E = h\upsilon$	$E = \dfrac{hc}{\lambda}$	$E_n = -\dfrac{Rhc}{n^2}$	$\lambda = \dfrac{h}{mv}$	$\dfrac{1}{\lambda} = R\left(\dfrac{1}{2^2} - \dfrac{1}{n^2}\right)$
$c = 2.998 \times 10^8$ m/s	$h = 6.626 \times 10^{-34}$ J·s		$Rhc = 2.18 \times 10^{-18}$ J	$R = 1.0974 \times 10^7$ m^{-1}	

S37 – Quick Check #1

☐ **Electromagnetic Spectrum**
    List all electromagnetic radiations from low energy to high.

			R O Y G B V			
			Visible range			

    We can see electromagnetic radiation with wavelengths between 400 nm and 700 nm.
    Is 400 nm red light or violet light? _____ Justify your answer.

    Consider this graphic from the **Online Tutorial: Electromagnetic Radiation**. The scale is in nm.

    What is the wavelength (λ) of this wave? _____nm
    Would you be able to see this wave? _____
    What is this wavelength in meters? _____m
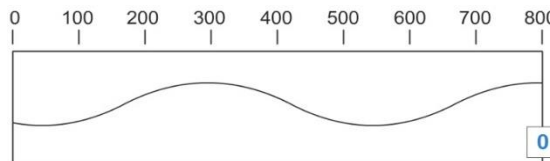
☐ **Calculations**
    Yellow light from a sodium vapor light has a wavelength of 589 nm.
    Calculate the frequency of this color of yellow light in Hz.

    A radio station (KPCC) has a frequency of 89.3 MHz (megahertz).
    How many Hz are in a MHz? _____
    What is the frequency of this radio wave in s^{-1}? _____
    What is the energy of the radio waves being emitted (in Joules)?

Struggled? Got some wrong? Do some self-study!

S38 – Quick Check #2

☐ **Calculations**

Calculate the energy of level n=3 of the hydrogen atom.
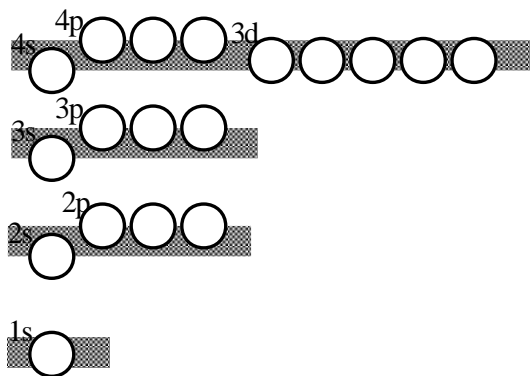
Calculate the energy and wavelength of light emitted when an electron drops from level n=5 to n=2.
What color will this light be? _____

A runner with a mass of 50.0 kg moves at a velocity of 2.00 m/s.
Calculate her deBroglie wavelength as she moves?

S39 – Quick Check #3

☐ **Orbital Diagrams**

How many electrons does neutral Vanadium have? _____ Correctly fill in the orbital diagram below.

How many valence electrons does Vanadium have? _____

Put a box around them.

Which electrons above are *furthest away* from the nucleus? _____

Write the <u>Long Form</u> electron configuration for Vanadium.

_____

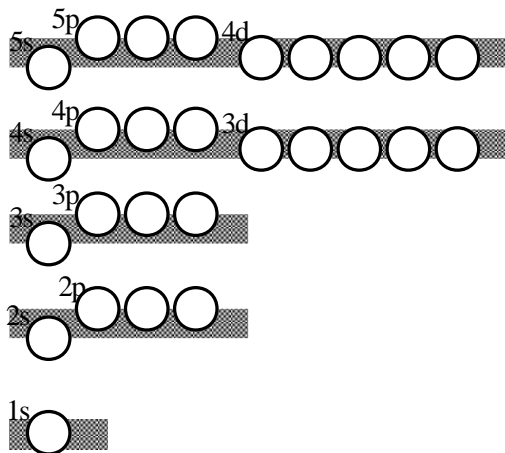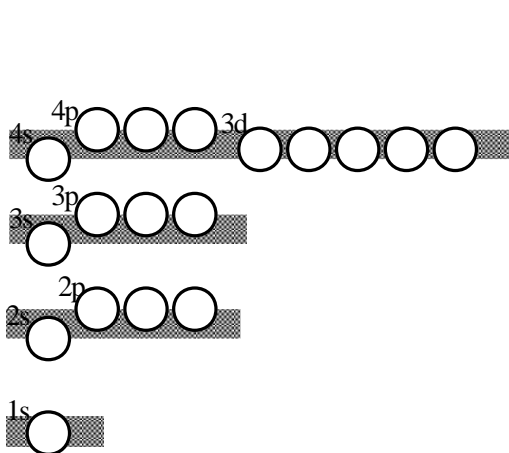Write the <u>Short Form</u> (noble gas) electron configuration for Vanadium.

_____

Which electrons in Vanadium have the *greatest amount of energy*? _____

Would Vanadium be considered to be an <u>s-block</u>, <u>p-block</u>, <u>d-block</u> or <u>f-block</u> element? _____

Struggled? Got some wrong? Do some self-study!

Correctly fill in one of the diagrams below for Manganese ion (Mn^{2+}), which has _____ electrons.
Correctly fill in one of the diagrams below for Molybdenum, Mo, which has _____ electrons.

☐ Periodicity

Looking at the periodic table, shade in a "period" red. Shade in a "group" blue.
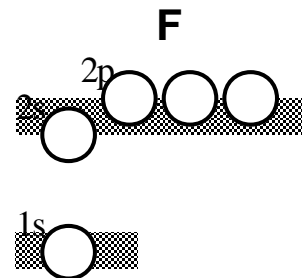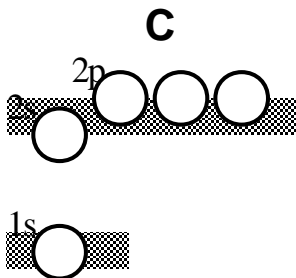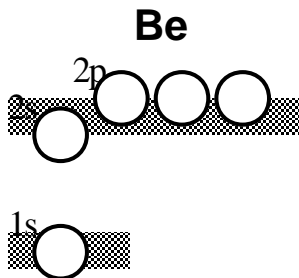

What is the difference between a "group" and a "family"? _____

S40 – Quick Check #4

☐ Paramagnatism

These elements are in Period ___. List them from least to most paramagnetic: ____<____<____

| Be | C | F |

Struggled? Got some wrong? Do some self-study!

S41 – Quick Check #5

☐ **Periodic Trends (Periodicity)**

Write the equation for the first ionization energy of Be. What is the phase of Be? _____ (g)/(l)/(s)

Write the equation for the first ionization energy of F.

Looking at the four elements to the right, which of these elements.
Which would have the *largest* atomic size?

14	15
Si	P
28.09	30.97
32	33
Ge	As
72.59	74.92

What is your *explanation* for your answer above?

_____

_____

If beryllium turned into an ion, would the size of that ion be bigger or smaller than neutral Be?

Explain. _____

_____

S42 – Quick Check #6

☐ **Mixed Problems**

Write the ground state electron configuration (short form or long form) for an arsenic atom.

Is an isolated arsenic atom in the ground state paramagnetic or diamagnetic?_____
Justify your answer.

What **ion charge** would As be expected to form? _____

The ion would be named _____

Write the electron configuration for the ion.

Struggled? Got some wrong? Do some self-study!