Activity 1. Determine the symbol, number of protons, neutrons and electrons for each neutral atom listed below.

ISOTOPE	SYMBOL	PROTONS	NEUTRONS	ELECTRONS
Magnesium-24	^{24}Mg	12	12	12
Iron-56	^{56}Fe	26	30	26
Iodine-127	^{127}I	53	74	53
Selenium-79	^{79}Se	34	45	34
Phosphorus-32	^{32}P	15	17	15

Activity 2. Write the electron configuration for each element from Activity 1.

Mg: $1s^2\ 2s^2\ 2p^6\ 3s^2$

P: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$

Fe: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^6$

I: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^2\ 4d^{10}\ 5p^5$

Se: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^4$

Activity 3. How many electrons do each of the following ions have?

Mg^{2+}	Fe^{3+}	I^-	Fe^{2+}	Se^{2-}	P^{3-}
10	23	54	24	36	18

Activity 4. Determine how many valence electrons are present in each element in Activity 1.

Mg → 2 Fe → 2 I → 7 Se → 6 P → 5

Activity 5. Draw a Lewis symbol for each atom in Activity 1.

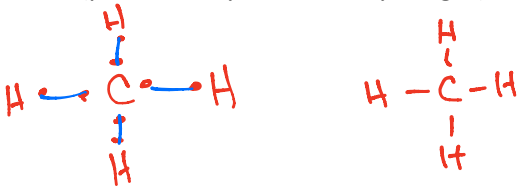
Activity 6. Each element we explored in this exercise is an important dietary micronutrient. What do you know about these already? How do we get them in our diet? Why do we need them?

Activity 1. Draw a Lewis Symbol for each of the following atoms:

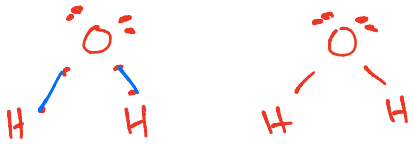
Carbon (4 V.E.) Nitrogen (5 VE) Oxygen (6 VE) Hydrogen 1VE Phosphorus 5VE

Activity 2. Using the Lewis symbols you determined above, draw a Lewis structure for each of these nutrition-related molecules

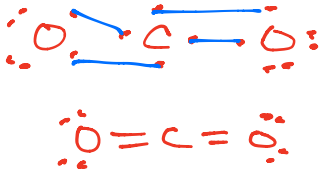
CH_4 (produced by bacteria in your gut)



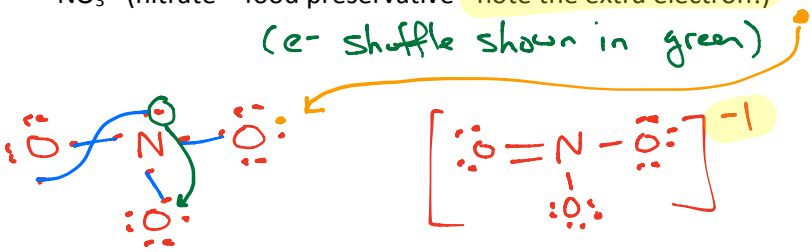
H_2O (all life needs water)



CO_2 (a product of fermentation)

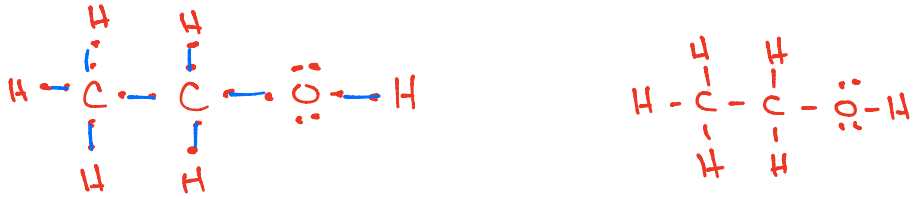


NO_3^{-1} (nitrate – food preservative - note the extra electron!)



H_2CO_3 (carbonic acid – this is how CO_2 is transported through your blood - each hydrogen is bonded to an oxygen)

CH_3CH_2OH (Ethanol – yeast make it during beer and wine fermentation)



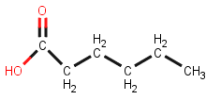
Activity 3. Using the Lewis structures above, determine how H_2O and CO_2 can combine to form H_2CO_3.

Ignore this!

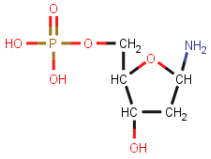
Activity 4. Each of the structures below show a building block of a biological polymer. Deconstruct each molecule to show how the atoms combine to form bonds –please show all electrons in your work. An example is given.

See below

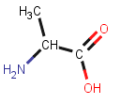
Glycerol
(backbone of fat in cell membranes and fat tissue)



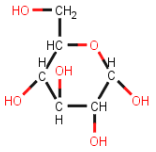
Fatty Acid
(building block of fat)



DNA monomer
(deoxyribose)



Protein monomer
(amino acid)

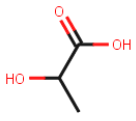


Sugar monomer
(glucose)

Activity 5. Molecules are commonly shown in "stick" form. This is a "lazy chemist" strategy to more quickly depict the structure of organic molecules. Since all organic molecules are built from carbon and hydrogen (and usually a lot of carbon and hydrogen atoms), these atoms are abbreviated. Hydrogen atoms are not shown if they are bonded to a carbon. Carbon atoms are shown as the end or bend in a line. The resulting structure is a bunch of lines with "heteroatoms" (anything that is not carbon or hydrogen) shown.

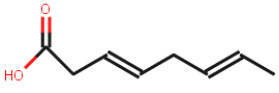
Show the stick form of each molecule in Activity 5.

Please convert each of the following stick renderings to a complete Lewis dot structure. Glycerol is shown as an example.

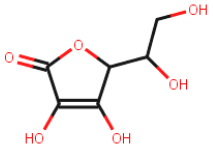


Lactic Acid
(product of fermentation and working out)

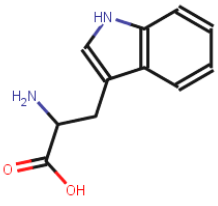
Ethanol
(product of alcoholic fermentation by yeast)



Fatty Acid
(building block of fat)



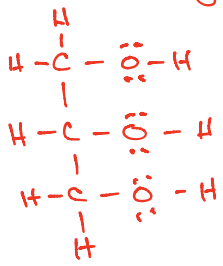
Vitamin C



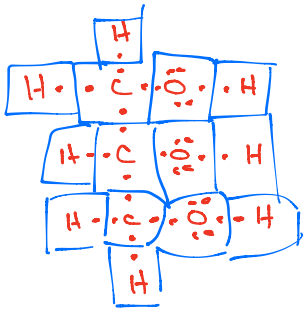
Tryptophan
(Think Thanksgiving)

4) glycerol

redraw showing All atoms And e-



Now show how e- have combined to form bonds



Fatty acid → I'll finish this once we finish class