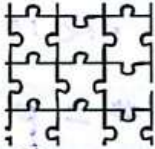


Exceptions to the Octet Rule
CAeMis+ry: <http://genest.weebly.com>
 Stop in for help every day at lunch and Tues, & Thurs after school!



Name ANSWERS
 Period ANSWERS

1. How many protons 15 and neutrons 17 are in:
 $^{32}_{15}\text{P}$

2. How many valence electrons are in each of the following?

$1s^2 2s^2 2p^5$
seven

a +1 cation of sodium
eight

two

$\cdot\cdot$
 $\cdot\text{Cl}\cdot$
 $\cdot\cdot$
seven

a neutral carbon atom
four

How many protons and neutrons are in:
 $^{32}_{15}\text{P}$

3. For an atom with atomic number =9, charge of zero, and 10 neutrons...

- a. mass number 19
- b. number of protons? 9
- c. number of electrons 9
- d. symbol of the element, with highLow numbers $^{19}_9\text{F}$

4. For an atom with 14 protons and 15 neutrons and 18 electrons

- a. mass number 29
- b. atomic number 14
- c. number of electrons 14
- d. symbol of the element Si
- e. charge of the atom 4^-
- f. symbol of the element, with highLow numbers $^{29}_{14}\text{Si}^{4-}$



5. For this atom,
 a. how many **total** electrons? 14
 b. how many protons? 14
 c. how many **valence** electrons? 4

6. What is true about the number of particles in an atom that has a neutral charge?

the number of e^- equals the number of protons

7. What is true about the number of particles in any cation?
SINCE CATIONS ARE POSITIVE

8. Write the formula for finding mass number of an atom.
mass # = P + N

9. Write the formula for finding the charge of an atom.
CHARGE = P - e

<p>9. In the after box redraw what this atom will look like after losing two electrons.</p> <p>The charge before <u>zero</u> The charge after <u>+2</u> It became a (anion / cation)</p>	<p>Before</p>	→	<p>After</p>	<p>HighLow Letter symbol for the after atom?</p> <p>⁴He</p>
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10. Which element in Group 1 has the largest radius? **Francium**

11. Which element in Period 1 has the largest radius? **hydrogen**

13. The Law of Conservation of Energy says that if nothing enters or leaves a system, the total energy in that system must be the same before and after any change.

Use this law to spot any fibs below:

<p>a) (possible / impossible)</p> <p>Reactants: E_{th}, E_{ph}, E_{ch}</p> <p>Energy Flow: <u>None</u></p> <p>Products: E_{th}, E_{ph}, E_{ch}</p>	<p>b) (possible / impossible)</p> <p>Reactants: E_{th}, E_{ph}, E_{ch}</p> <p>Energy Flow: <u>None</u></p> <p>Products: E_{th}, E_{ph}, E_{ch}</p>
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14. The Law of Conservation of Charge is similar to the two laws above. It says that if nothing enters or leaves a system, the total charge in that system must be the same before and after any change.

15. The Law of Conservation of Charge can help us spot wrongly written equations for ions.

- $Ba + 2e^- \rightarrow Ba^{2+}$ possible / impossible
- $F \rightarrow F^+ + e^-$ possible / impossible
- $S \rightarrow S^{2+} + 2e^-$ possible / impossible

12. Draw a stable Lewis Dot structure for each molecule:

<p>I_3^-</p> <p>What's the name of this geometry? LINEAR</p>	<p>CO_3^{2-}</p> <p>What's the name of this geometry? trigonal planar</p>
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Draw polar bonds

CleMis+ry:

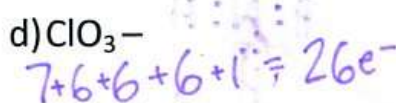
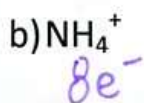
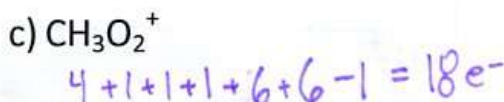
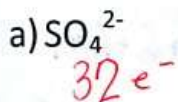
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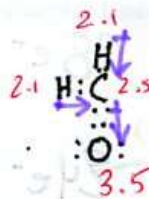
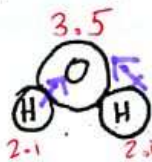
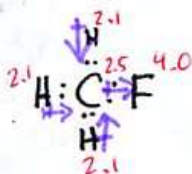


Name Ann
Period 5.15

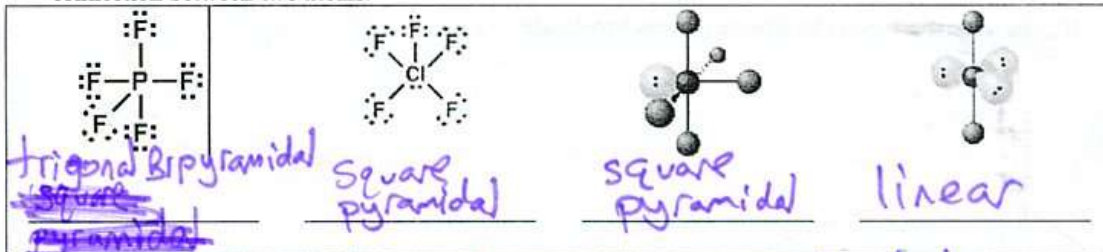
- According to your electronegativity table, what is the exact electronegativity of each element below?
 - beryllium 1.5
 - phosphorous 2.1
 - calcium 1.0
 - fluorine 4.0
- Calculate the number of valence e⁻ in each of the following:



- Next to each atom, write the electronegativity value from your table. Then draw an arrow to show the direction of polarity of the bond. Finally, write the symbols for partial positive and negative δ^+ and δ^- .

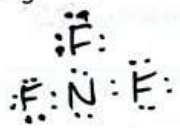
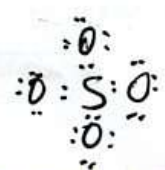
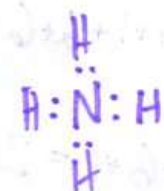
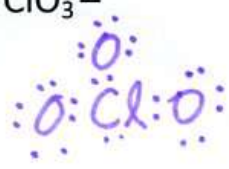


- Why does your table not have electronegativity numbers for the noble gases?
Since... (see below)
- Next to each, write the name of the geometric shape based on the central atom. Assume each line is a connection between two atoms.

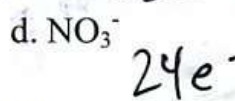
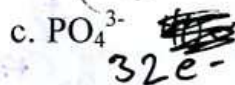
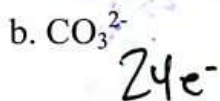
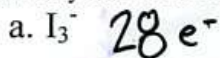


#4 Since electronegativity measures bonded e⁻ IT CANNOT BE MEASURED for NOBEL GASES BECAUSE THEY CANNOT BOND

6. Draw a stable Lewis Dot structure for each molecule AND THEN WRITE the name of the molecule's geometry, based on the central atom:

<p>a) NF_3</p>  <p>trigonal pyramidal</p> <p>What's the name of this geometry?</p>	<p>b) SO_4^{2-}</p>  <p>TETRAHEDRAL</p> <p>What's the name of this geometry?</p>
<p>NH_4^+</p>  <p>tetrahedral</p> <p>What's the name of this geometry?</p>	<p>ClO_3^-</p> <p>$7 + 6 + 6 + 6 + 1$</p>  <p>TRIGONAL PYRAMIDAL</p> <p>What's the name of this geometry?</p>

7. How many total valence e- are in each of the following?



8. Which element in Group 2 has the largest radius?

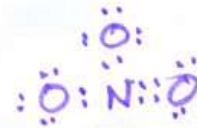

Radium

9. Which element in Period 2 has the largest radius?

LITHIUM

10. Draw a stable Lewis Dot structure for each molecule:



<p style="text-align: center;">I_3^-</p> <p style="text-align: center; font-size: 2em; color: blue;">LINEAR</p> <p>What's the name of this geometry?</p>	<p style="text-align: center;">CO_3^{2-}</p> <p style="text-align: center; font-size: 2em; color: blue;">TRIGONAL PLANER</p> <p>What's the name of this geometry?</p>
<p style="text-align: center;">NO_3^-</p> <div style="text-align: center;">  </div> <p style="text-align: center; font-size: 1.5em; color: blue;">TRIGONAL PLANER</p> <p>What's the name of this geometry?</p>	<p style="text-align: center;">SCl_2 $6 + 7 \times 2 = 20e^-$</p> <div style="text-align: center;">  </div> <p>What's the name of this geometry?</p> <p style="text-align: center; font-size: 1.5em; color: blue;">BENT</p>

5 6 6 6 1 = 240°



We have a big test Friday.

To study you should RE DO your old worksheets until they are ridiculously easy.

Purpose:

Can any atoms hold more than an octet in their outer orbit?

WARMUP :

Write an answer sheet in your notes, we're about to take a fake quiz:

Fake Quiz:

1

2

3

4

5

6

Practice Quiz

write the names that match the following six scientist descriptions"

1) Proposed that electrons are in shells around the atom. Stable atoms have a full valence shell (we just learned this in class)

2) There's no such thing as 'living molecules' and 'nonliving molecules'. Everything is just made of atoms – there's no difference between atoms in living and nonliving things. Saw all this because UREA formed in a jar on his desk.

3) Discovered the strongest substance that will ever be discovered. Ever.

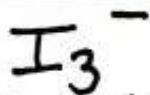
4) Discovered charged particles called electrons by using a glowing glass tube and electricity. Discovered electrons are negative.

5) Discovered cesium and rubidium. Discovered that the sun has atoms of sodium.

Saw rainbow colored light spectrums in flames.

6) Organized the elements into a table with groups and rows (we now call this The Periodic Table)

#1 These are possible:



Draw I_3^- and tell its shape.

Total valence e^-

$$7 + 7 + 7 + 1 = 22e^-$$



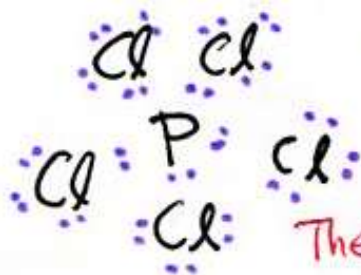
The middle
ATOM HAS 5 THINGS

2 are atoms
3 lone pairs

THE SHAPE IS LINEAR

Draw PCl_5 and tell its shape.

total valence e^- : $5 + 35 = 40e^-$

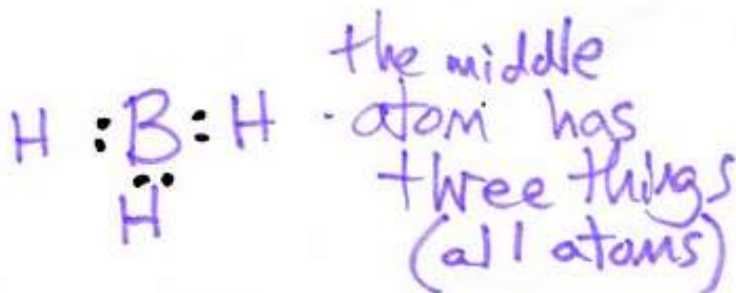


the middle atom
has five things
(all are atoms)

The shape is
trigonal bipyramidal

Draw BH_3 and tell its shape.

total valence : $3 + 1 + 1 + 1 = 6e^-$



the middle
atom has
three things
(all atoms)

the shape is trigonal planar

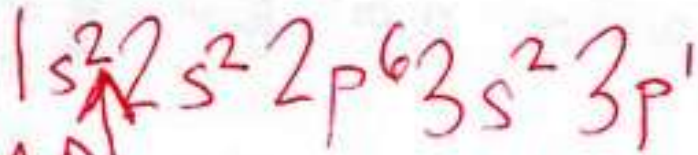
#2 Expanded octets are possible in large molecules (only phosphorus and larger elements can do this)

Draw UF_6 and tell its shape.

#3 Partially empty octets are possible in small molecules (only boron and beryllium can do this).

Draw BeH_2 and tell its shape.

COPY THIS ATOM



tells
which
orbit



tells
how
many
electrons

Friday's Test

Covers the last three weeks.

Covers all the 'patterns' sheets.

You are allowed to bring your movie notes sheet IF you don't write a bunch of other stuff on it.

If you were absent, get a blank movie notes sheet and copy the notes from a friend OR watch the movie at genest.weebly.com

Friday's Test

There is a secret way to get an 'A' on any test in

- physics
- chemistry
- math

Do the entire homework assignment over

or

At least do over any problem you marked with an X during homework check.

