Adv Topics L2 Syllabus Review Name:_____

1. What is the name of this course?
2. What is the name of your teacher?
3. List three of your five required daily materials:
    -
    -
    -
4. Identify and describe one of this course's ethics:
    -
5. Who is your class partner?

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Adv Topics L3 DO NOW! Name:_____

1. [2]The Law of Conservation of charge states . . .

2. [2]What is overall charge of the universe?

[2]Complete the following chart:

Subatomic Particle	Mass (in kg)	Charge (in Coulombs)
proton	3.	4.
neutron		5.
electron	6.	7.

8. [2]Using fence–posting, calculate many electrons are in 2.00 g H_2O:

Adv Topics L3 DO NOW! Name:_____

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8. [2]Using fence–posting, calculate many electrons are in 2.00 g H_2O:

Adv Topics L4 DO NOW! Name:_____

1. [3]What is the formula for Coulomb's Law?

2. [3]Where is most of the mass located in an atom?

3. [3]The proton is _____ times more massive than an electron.

4. [3]What is Newton's Second Law of Motion?

5. [3]What is the overall charge of an atom?

6. [3]Identify one way that electrons can move from one object to another.

7. [3]What is the overall charge of a molecule?

8. [3]What is the electronegativity difference between 2 atoms in a **nonpolar covalent** bond?

9. [3]What is the electronegativity difference range between 2 atoms in a **polar covalent** bond?

10. [3]What is the electronegativity difference between 2 atoms in an **ionic** bond?

Adv Topics L5-L6 DO NOW! Name:_____

1. [5]What is the formula for Coulomb's Law?

2. [5]What is the mathematical value for the permittivity of free space, ε_0?

3. [5]What is the mathematical value for the "k" constant?

4. [5]How is the "k" constant mathematically related to ε_0?

Table 1 – Electronegativity Values

H 2.1		C 2.5	N 3.0	O 3.5	F 4.0
Na 0.9	Mg 1.2	Si 1.8	P 2.1	S 2.5	Cl 3.0
					Br 2.8

5. [6]**Types of Bonds:** Using the electronegativity values in Table 1 above, indicate whether each of the following bonds would be ionic (I), polar-covalent (P) or nonpolar-covalent (N).

   a. _____ Mg—Cl B. _____ P—N C. _____ Cl—Br

6. [6]**Dipole Moments:** For the following covalent bonds, indicate which end is slightly positive and which end is slightly negative by using an arrow. Use the electronegativity values in Table 1 above.

   a. N — P B. H — Br C. Cl — S

7. [6]**Intermolecular Forces:** Identify the <u>strongest</u> attractive force: Hydrogen Bonding (HB), Dipole-Dipole (DD), or London Dispersion (LD) that would occur between molecules of each of the following:

   a. _____ NH_3 B. _____ SO_2 C. _____ F_2

8. [6]Explain how temporary dipoles are formed in nonpolar covalent bonds.

Adv Topics L7 (Block Pt. 1) DO NOW! Name:_____

1. [5]What is the formula for Coulomb's Law?

2. [5]What is the mathematical value for the permittivity of free space, ε_0?

3. [5]What is the mathematical value for the "k" constant?

4. [5]How is the "k" constant mathematically related to ε_0?

5. [6]In terms of F_{xyz}, ϕ, and θ, define F_x, F_y, and F_z.
   a. F_x =

   b. F_y =

   c. F_z =

6. [2]The Law of Conservation of charge states . . .

7. [3]Identify one way that electrons can move from one object to another.

8. [2]What is overall charge of the universe?

9. [3]What is the overall charge of an atom?

10. [3]What is the overall charge of a molecule?

[2]Complete the following chart:

Subatomic Particle	Mass (in kg)	Charge (in Coulombs)
proton	11.	12.
neutron		13.
electron	14.	15.

16. [3]Where is most of the mass located in an atom?

17. [3]The proton is _____ times more massive than an electron.

18. [3]How does Newton's Second Law of Motion apply to protons and electrons?

Table 1 – Electronegativity Values

H 2.1		C 2.5	N 3.0	O 3.5	F 4.0
Na 0.9	Mg 1.2	Si 1.8	P 2.1	S 2.5	Cl 3.0
					Br 2.8

19. [3]What is the electronegativity difference between 2 atoms in a **nonpolar covalent** bond?

20. [3]What is the electronegativity difference range between 2 atoms in a **polar covalent** bond?

21. [3]What is the electronegativity difference between 2 atoms in an **ionic** bond?

22. [6]**Types of Bonds:** Using the electronegativity values in Table 1 above, indicate whether each of the following bonds would be ionic (I), polar-covalent (P) or nonpolar-covalent (N).

a. _____ Mg—Cl B. _____ P—N C. _____ Cl—Br

23. [6]**Dipole Moments:** For the following covalent bonds, indicate which end is slightly positive and which end is slightly negative by using an arrow. Use the electronegativity values in Table 1 above.

b. N — P B. H — Br C. Cl — S

24. [6]**Intermolecular Forces:** Identify the <u>strongest</u> attractive force: Hydrogen Bonding (HB), Dipole-Dipole (DD), or London Dispersion (LD) that would occur between molecules of each of the following:

c. _____ NH_3 B. _____ SO_2 C. _____ F_2

25. [6]Explain how temporary dipoles are formed in nonpolar covalent bonds.

Adv Topics L8 (Block Pt. 2) DO NOW! Name:_____

1. In a _____, charge flows easily. These are generally made of _____.
2. In a _____, almost no charge flows.
3. All atoms want to have an electron configuration of a(n) _____.
4. Metals lose an electron or electrons because . . . (Provide an example)

5. Nonmetals gain an electron or electrons because . . . (Provide an example)

Identify the following as a conductor (C), insulator (I), or semiconductor (S).

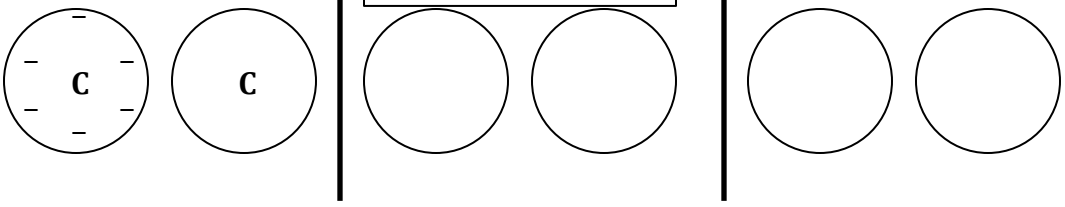
6. Sb _____
7. As _____
8. Al _____
9. Se _____
10. H _____
11. O _____
12. N _____
13. Rh _____
14. Ni _____
15. Nd _____
16. Np _____
17. Ge _____
18. Fe _____
19. Am _____
20. Ru _____
21. U _____

Adv Topics L9 DO NOW! Name:_____

Identify how the charge will move for the following examples:

Before During After

Scenario #1:



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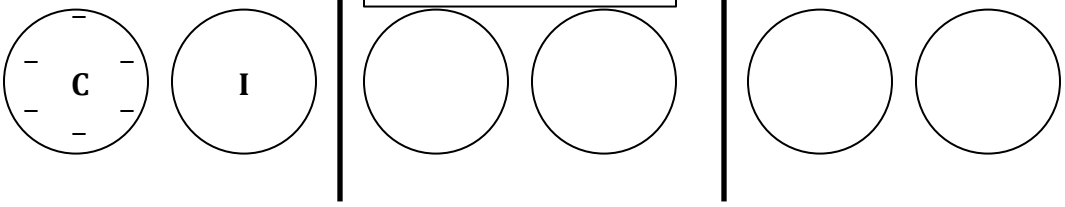

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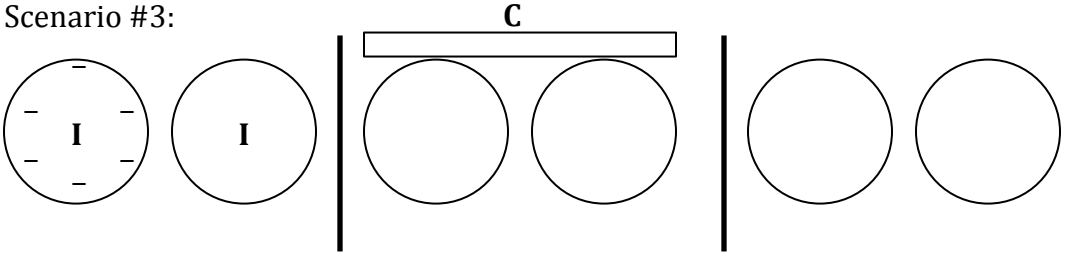

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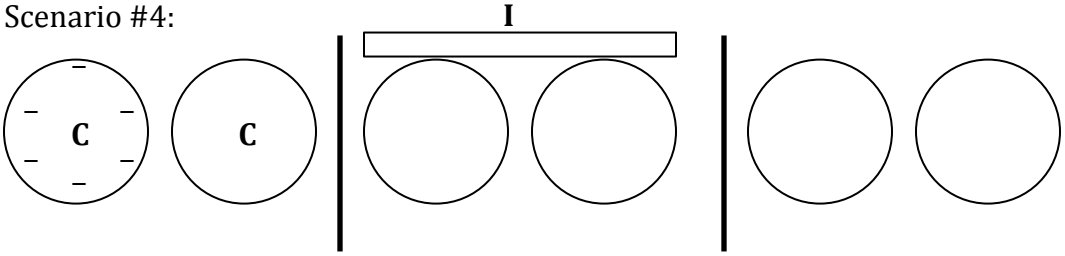

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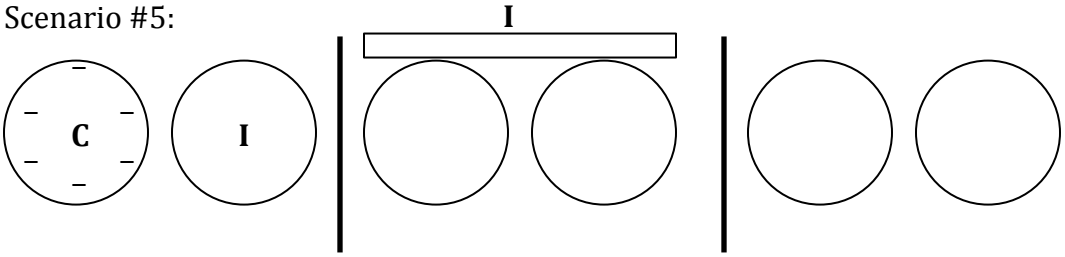
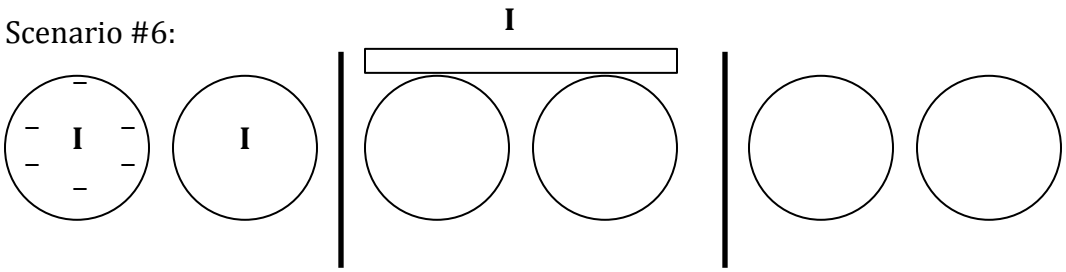


Scenario #6:



Adv Topics L10 DO NOW! Name:_____

1. What are the various formulas for the electric field?

2. What equation relates the force to the electric field?

3. A proton is released in a uniform electric field, and it experiences an electric force of 1.0×10^{-14} N toward the south. What is the magnitude and direction of the electric field?

4. What is the magnitude and direction of the electric force on an electron in a uniform electric field of strength 1240 N/C that points due west?

Adv Topics L10 DO NOW! Name:_____

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Adv Topics L11 DO NOW! Name:_____

What is the electric field at a point when the force on a 1.20 μC charge placed at that point is $\mathbf{F} = (3.0\,\mathbf{i} - 5.0\,\mathbf{j}) \times 10^{-3}$ N?

Adv Topics L11 DO NOW! Name:_____

What is the electric field at a point when the force on a 1.20 μC charge placed at that point is $\mathbf{F} = (3.0\,\mathbf{i} - 5.0\,\mathbf{j}) \times 10^{-3}$ N?

Adv Topics L12 DO NOW! Name:_____

Explain how electrical induction occurs.

What would happen if . . .

1. a *negatively*-charged object was **allowed to touch** a metal faucet that was connected to ground and the faucet was chopped off with a super axe hacker...
    i. before the *negatively*-charged object was removed:

    ii. after the *negatively*-charged object was removed:

2. a metal faucet that was connected to ground, the faucet was chopped off with a super axe hacker, a *negatively*-charged object was **allowed to touch** it, and the *negatively*-charged object was then removed:

3. a *negatively*-charged object was **brought near** a metal faucet that was connected to ground and the faucet was chopped off with a super axe hacker...
    i. before the *negatively*-charged object was removed:

    ii. after the *negatively*-charged object was removed:

4. a metal faucet that was connected to ground, the faucet was chopped off with a super axe hacker, a *negatively*-charged object was **brought near** it, and the *negatively*-charged object was then removed:

5. a *positively*-charged object was **allowed to touch** a metal faucet that was connected to ground and the faucet was chopped off with a super axe hacker...
    i. before the *positively*-charged object was removed:

    ii. after the *positively*-charged object was removed:

6. a metal faucet that was connected to ground, the faucet was chopped off with a super axe hacker, a *positively*-charged object was **allowed to touch** it, and the *positively*-charged object was then removed:

7. a *positively*-charged object was **brought near** a metal faucet that was connected to ground and the faucet was chopped off with a super axe hacker...
    i. before the *positively*-charged object was removed:

    ii. after the *positively*-charged object was removed:

8. a metal faucet that was connected to ground, the faucet was chopped off with a super axe hacker, a *positively*-charged object was **brought near** it, and the *positively*-charged object was then removed:

9. a *negatively*-charged piece of plastic was **allowed to touch** a metal faucet that was connected to ground and the faucet was chopped off with a super axe hacker...
    i. before the *negatively*-charged piece of plastic was removed:

    ii. after the *negatively*-charged piece of plastic was removed:

10. a *positively*-charged glass rod was **allowed to touch** a metal faucet that was connected to ground and the faucet was chopped off with a super axe hacker...
    i. before the *positively*-charged glass rod was removed:

    ii. after the *positively*-charged glass rod was removed:

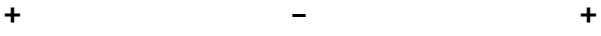
Adv Topics L13 DO NOW! Name:_____

Draw the electric field lines for the following scenarios:

Scenario #1:

Scenario #2:

Scenario #3:



Scenario #4:

Adv Topics L14 DO NOW! Name:_____

Electrostatics Lab