Prepared by Mr. Forrest/ AP Physics 1: 2017-18

Name: _____
Partner: _____

Electrostatics CONCEPT BUILDERS

Overview:

There are three concept builders that will be helpful in your understanding of the brief topic of electrostatics. Big ideas of this concept are:

- Electrons are the charge that moves in solids, and they are negatively charged
- The electrostatic force is represented by Coulomb's law, which is an inverse square law much like the Law of universal Gravitation. The formula for Coulomb's Law is $F_{electric} = \frac{k*Q_1Q_2}{d^2}$. K is the constant of 9.0 x 10^9 N*m^2/coul^2, and Q_1 and Q_2 are the charges on each of two objects in units of coulombs. One coulomb is a very large amount of charge, as 1.6 x 10^{-19} coulombs is the fundamental unit of charge on a single electron or proton, and 6.25 x 10^{18} charges is equal to one coulomb.
- Objects attract when they have opposite charges, and they repel when they have like charges. While neutral objects might not interact with objects that are charges, in certain cases neutral objects can become polarized in the presence of a charged object. Polarization is where charge can separate on a neutral object so that a neutral conductor would attract to an object that is either positively or negatively charged.

Procedures:

1) Sign out a computer.

2) Go **to** ***http://www.physicsclassroom.com/Concept-Builders*** to access the challenge. (or just choose Concept Builders at the left side of the page).

3) Go to Static Electricity. Then choose the '**Charge and Charging Motion**'. Finally, '**Launch Concept Builder'**. Then type in your name and your partner's name (if you have a partner). Choose 'Get Into The Flow' first, and once completed, choose 'Analyze This! Make sure your teacher signs off on these, or that you take a selfie of the completed screen.

Get into the flow:	**# of attempts**	**Analyze this!**	**# of attempts**
1.	_____	1.	_____
2.	_____	2.	_____
3.	_____	3.	_____
4.	_____	4.	_____
5.	_____		
6.	_____	Teacher initials: _____	

4) Next, go to the **'Coulomb's Law'** Concept Builder and choose the **Wizard** level, because you are a physics WHIZ! Once again, have your teacher initial off when you're done or take a selfie so he can view it later.

Scenario:	**# of attempts**	**Scenario:**	**# of attempts**	
1.	_____	4.	_____	
2.	_____	5.	_____	Teacher initials: _____
3.	_____	6.	_____	

5) Finally, go to the **'Charge Interactions'** Concept Builder and choose the **Apprentice** level, because while you are a physics WHIZ, AP Physics 1 really doesn't deal with polarization (mentioned at the beginning of this assignment) so we only want to deal minimally with that. Once again, have your teacher initial off when you're done or take a selfie so he can view it later.

Scenario:	**# of attempts**	**Scenario:**	**# of attempts**
1.	_____	4.	_____
2.	_____		
3.	_____		

Teacher initials: _____

Post-activity question:

1) Rank the three concept builders from easiest to toughest.

Easiest: _____

Middle: _____

Toughest: _____

Explain the reasoning for your choice.