## Virtual Capacitor Experiment – Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hand in at end of class for full credit.

Open the following webpage, and then click on the multiple capacitor tab.

<http://phet.colorado.edu/en/simulation/capacitor-lab>

1. Click on three capacitor in series button.
2. Move the voltage slide to maximum and measure the voltage across the battery with the voltmeter. Vmax=\_\_\_\_\_
3. Change the settings on the 3 caps to :

C1= 1.0 C2= 2.0 C3= 2.5

1. Now measure the voltage across each capacitor.

V1= \_\_\_\_\_\_ V2=\_\_\_\_\_ V3=\_\_\_\_

1. What is the relationship of voltages?
2. Using the stated capacitance (1.0x10-13 F, 2.0x10-13 F, 2.5x10-13 F) find the charge on each capacitor.

q1=\_\_\_\_ q2=\_\_\_\_ q3=\_\_\_\_

1. What is the total capacitance in Farads? Read meter
2. Use formula to find the total capacitance.

2) Click on the three capacitors in parallel button.

1. Change the settings on the 3 caps to :

C1= 1.0 C2= 2.0 C3= 2.5

1. Now measure the voltage across each capacitor.

V1= \_\_\_\_\_\_ V2=\_\_\_\_\_ V3=\_\_\_\_

1. What is the relationship of voltages?
2. Using the stated capacitance (1.0x10-13 F, 2.0x10-13 F, 2.5x10-13 F) find the charge on each capacitor.

q1=\_\_\_\_ q2=\_\_\_\_ q3=\_\_\_\_

1. What is the total capacitance in Farads? Read meter
2. Use formula to find the Total capacitance.

3. Now click on the two in series and one in parallel button.  
  
 a. Now measure the voltage across each capacitor.

V1= \_\_\_\_\_\_ V2=\_\_\_\_\_ V3=\_\_\_\_

1. Using the stated capacitance (1.0x10-13 F, 2.0x10-13 F, 2.5x10-13 F) find the charge on each capacitor.

q1=\_\_\_\_ q2=\_\_\_\_ q3=\_\_\_\_

1. What is your measured total capacitance in Farads? Read meter
2. Now calculate the theoretical capacitance and a percent agreement.

4. Finally click on the two in parallel and one in series button.

1. Now measure the voltage across each capacitor.

V1= \_\_\_\_\_\_ V2=\_\_\_\_\_ V3=\_\_\_\_

1. Using the stated capacitance (1.0x10-13 F, 2.0x10-13 F, 2.5x10-13 F) find the charge on each capacitor.

q1=\_\_\_\_ q2=\_\_\_\_ q3=\_\_\_\_

1. What is your measured total capacitance in Farads? Read meter
2. Now calculate the theoretical capacitance and a percent agreement.

**Conclusion Question**

Compare wiring capacitors in series versus wiring them in parallel.

Please answer the question in at least 10 sentences. Use paragraph form. Your answer should include the following points:

* How much charge can you accumulate on each plate in series vs. in parallel?
* How does the voltage compare across the plates in series vs. parallel?
* How does the total capacitance compare?
* Which would you rather use and why? (I.e. which would be more economical if you were building, say, a computer?)