

PLC Activity #1: Introduction to Physlets; Physics 4B Syllabus

*To get credit for this activity, you must hand in this assignment to the instructor **before 2:30 pm on Thursday.***

Part 1: Running Physics Applets (Physlets)

Many of the PLC assignments you will have in Physics 4B will involve Physlets. Physlets are *Physics Java Applets* that show animations of physical phenomena in a web browser. You will typically use the mouse to control the animations and collect data from them in order to answer questions regarding the phenomena.

The Physlet animations you will be using are from the book (and e-book) *Physlet Physics* by Wolfgang Christian and Mario Belloni. The authors define three different types of Physlet-based exercises: *Illustrations*, *Explorations* and *Problems*.

Illustrations are designed to demonstrate physical concepts. Students need to interact with the Physlet, but the answers to the questions posed in the Illustration are given or are easily determined from interacting with it.

Explorations are tutorial in nature. They provide some hints or suggest problem-solving strategies to students in working problems or understanding concepts.

Problems are interactive versions of the kind of exercises typically assigned for homework. They require the students to demonstrate their understanding without as much guidance as is given in the Explorations.

Using Chrome, go to: <http://www.compadre.org/Physlets/>

In the Contents Overview on the left, click Electromagnetism, then go to **Chapter 22: Electrostatics**. You will be looking at one Illustration, one Exploration, and one Problem to give you an idea of the different types of Physlets.

1) Illustration 22.4: Charging Objects and Static Cling

The animations in this Illustration model materials with charges (red = positive and blue = negative). The arrows show the forces between particles. Read through the Illustration, run the 5 animations, and then answer the following:

Explain why a negatively charged balloon is attracted to and sticks to a neutral wall (which is an insulator). Sketch the situation below showing the excess charges on the balloon and wall.

2) Exploration 22.6: Run Coulomb's Gauntlet

A positive test charge is shown in the animation. You can add positive and/or negative charges. All charges are added to the middle of the animation, so you must drag each newly added charge to a new location. When you push "play," the test charge will move under the influence of the forces from the other charges.

Move the charges so that the test charge can make it from its starting place to the finish line without hitting a wall.

a) Describe your technique and sketch your configuration below.

b) What is it about the Coulomb force that makes this so difficult? Explain.

3) Problem 22.7: Charge, inertia, and trajectories

An unknown green charge (with a #1 on it) is shot into a region containing four fixed charges (numbered 2-5), one of which is known to be positive (the red one).

Determine the signs of the unknown charges. You may consider neutral as a possible answer.

Part 2: Physics 4B Syllabus

Read through the Physics 4B syllabus (posted on the 4B home page) and answer the following questions:

4) How many missed classes *may* result in being dropped from the class? How many missed labs *will* result in being dropped from the class?

5) What is the policy on cell phone usage during lecture or lab?

6) What is the policy on late assignments?