

Physics 4B

PLC Activity #9: Circuits

*To get credit for this activity, you must show your answers to a PLC tutor and have them initial the sign-out sheet **before 4:00 pm on Wednesday.***

Show all of your work for each question.

Part 1: DC Circuit Physlets

1) Go to Chapter 30: DC Circuits and do Physlet Problem 30.1

You are given arrangements of identical light bulbs with the wires connecting them hidden from view. Determine how the light bulbs are connected by unscrewing and/or screwing the bulbs. All bulbs are initially screwed in their sockets, and the current through each bulb is given in the table (current is given in amperes).

Draw a schematic diagram representing the hidden circuit for each animation:

a) Circuit 1 - Three Bulbs

b) Circuit 2 - Three Bulbs

c) Circuit 3 - Four Bulbs

d) Circuit 4 - Four Bulbs

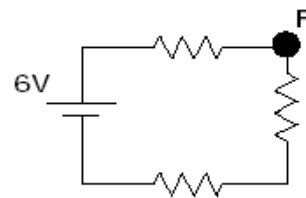
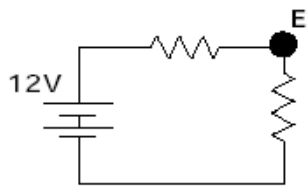
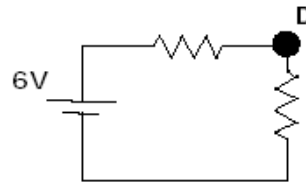
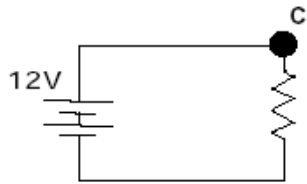
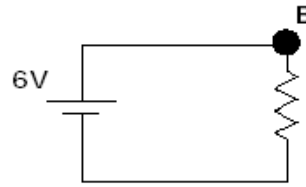
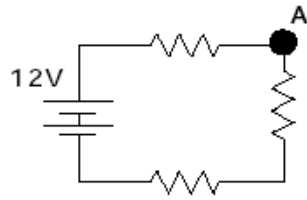
e) Circuit 5 - Five Bulbs

f) Circuit 6 - Six Bulbs

g) Circuit 7 - Six Bulbs

Part 2: Ranking Task Exercise

3) All the resistors in the circuits below are identical at 2Ω each. The batteries are ideal with voltages of 6 or 12 volts as shown below. All connecting wires have negligible resistance.



a) Rank the current passing through the upper right hand corner of each circuit from greatest to least.

Greatest 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ Least

Or, the current is the same in each situation. _____

b) Rank the voltage at the upper right hand corner relative to the ground. Place the highest voltage first and the lowest voltage last.

Highest 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ Lowest

Or, all of the voltages are the same. _____