AS Physics   Name_____
Enrichment – Electricity

Instructions
This assignment uses an online simulation to manipulate an electrical circuit. Afterward, you will
write an explanation using Kirchhoff's laws (current rule and voltage rule aka junction rule and
loop rule) for why your circuit successfully accomplishes the task.

Take a screenshot of the final result of each level (including an ammeter if necessary) and email
all to Mrs. McKeon. Be sure to clearly label each screenshot with each level.

Go to the online PhET simulation called "Circuit Construction Kit: DC - Virtual Lab" found at
https://phet.colorado.edu/en/simulation/circuit-construction-kit-dc-virtual-lab

Experiment
Complete the following levels. Note that your circuit cannot be "on fire" for your circuit to count.
1) Make a light bulb light brightly using 4 batteries.
2) Add an on/off switch.
3) Make 3 light bulbs light brightly with all 3 with the same brightness (same power).
   In your screenshot, include the ammeter displaying the current through each bulb.
4) Have a switch that turns on/off 2 of the 3 bulbs.
5) Have a switch that turns on/off all 3 lights.
6) Make a circuit with one main on/off switch that will turn on/off all 3 bulbs, each
   with a different brightness. Use the non-contact Ammeter to display the current
   through each bulb.

Analysis
Explain Kirchhoff's laws using your own words.

Using Kirchhoff's laws, write a paragraph explaining how circuit **3** works. Include any
calculations (if any).

Using Kirchhoff's laws, write a paragraph explaining how circuit **6** works. Include any
calculations (if any).

Adapted from the Electric Circuit Design Challenge by Philip Kukulski, from Metro Detroit