

Electric Circuits

Introduction:

A few well known facts:

- Light bulbs connected in *series* have the same current. The more bulbs that are in series, the dimmer they become.
- Light bulbs connected in *parallel* have the same voltage. Bulbs maintain their brightness when they are in parallel.
- The brighter the light bulb, the greater its power consumption.

Make sure your group has each of the following: a battery eliminator (a power pack that plugs into a wall outlet), 5 identical miniature light bulbs (with mounts), several patch cords, and connectors (alligator or fork shaped).

Procedure:

Set the battery eliminator at 3 VDC. Connect each mounted light bulb to the battery eliminator, one at a time, and note the brightness. This represents the “baseline” power level for each bulb.

Build each circuit described below and, *on a separate sheet of paper*, draw the corresponding circuit diagram.

CIRCUIT 1 – The minimum power circuit ($P_1 = P_2 = P_3 = P_4 = P_5 = \text{minimum}$)

There is only one way to wire the bulbs so that they have the same power which is lowest possible for your equipment.

CIRCUIT 2 – The maximum power circuit ($P_1 = P_2 = P_3 = P_4 = P_5 = \text{maximum}$)

There is only one way to wire the bulbs so that they have the same power which is highest possible for your equipment.

CIRCUIT 3 – $P_1 > P_2 = P_3 = P_4 = P_5$

There are two possible circuits – you are required to find only one.

CIRCUIT 4 – $P_1 = P_2 > P_3 = P_4 = P_5$

There are two possible circuits – you are required to find only one.

CIRCUIT 5 – $P_1, P_2 = P_3, P_4 = P_5$

There are two possible circuits – you are required to find only one.

CIRCUIT 6 – $P_1, P_2, P_3, P_4 = P_5$

There are two possible circuits – you are required to find only one.

**Before you leave lab, turn in your sheet of circuit diagrams.
Don't forget to write the names of your partners at the top!**

