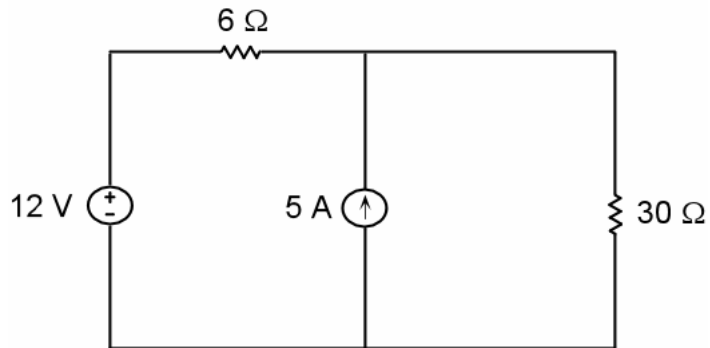


Circuit Analysis

Let's begin with a few minutes of review.

Write the necessary equations (the big gun equations) to solve for the currents and voltages in this DC circuit.

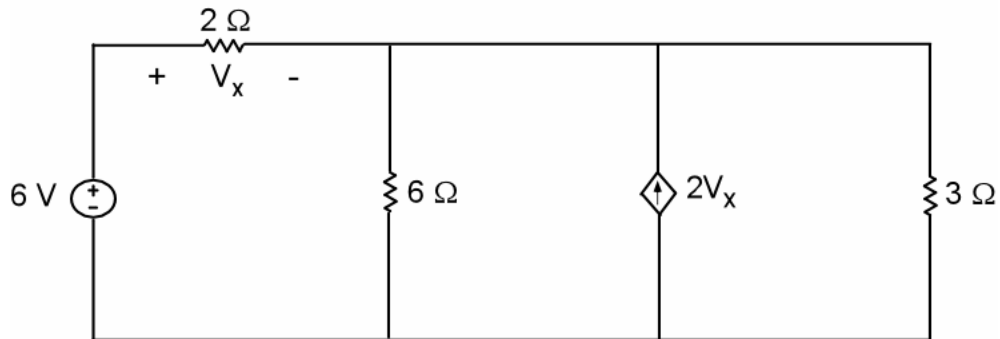


Now, suppose we have solved for the currents and voltages in the above circuit. Find the power delivered by each source.

(check your work: $P_{del(12V)} = -46 W$, $P_{del(5A)} = 175 W$)

Example

Write the necessary equations to solve for the currents and voltages in the circuit below. *Give the equations and a list of unknowns.*



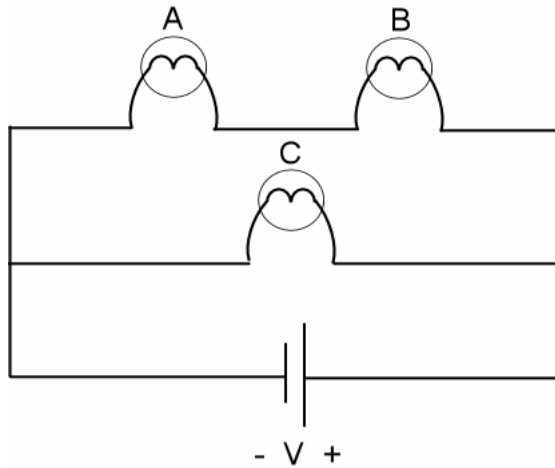
Suppose we've solved for the currents and voltages; find the power absorbed by the 3Ω resistance.

(Check your work: $P_{ab(3\ \Omega)} = 8.33\ \text{W}$)

Concepts from circuits

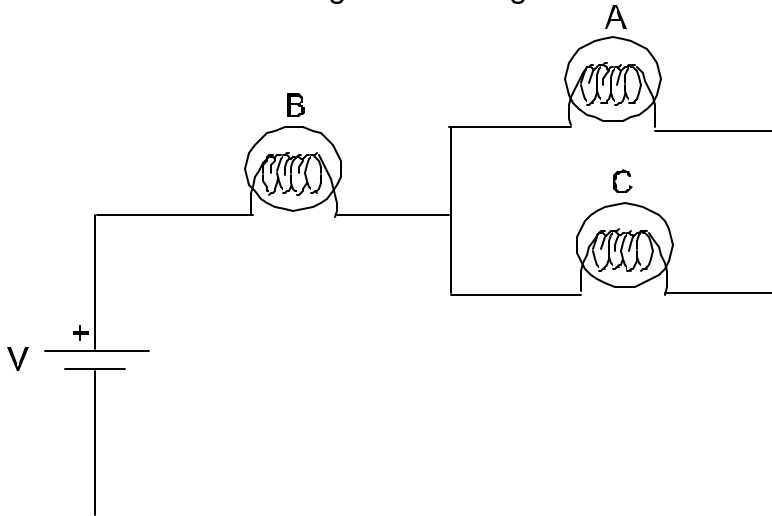
Let's consider lighting circuits composed of DC voltage sources and incandescent bulbs. (Incandescent bulbs are resistors which get sufficiently hot to glow, so think of the lamps as resistors.)

1. Suppose identical bulbs A, B, and C are connected to the DC voltage supply as shown.



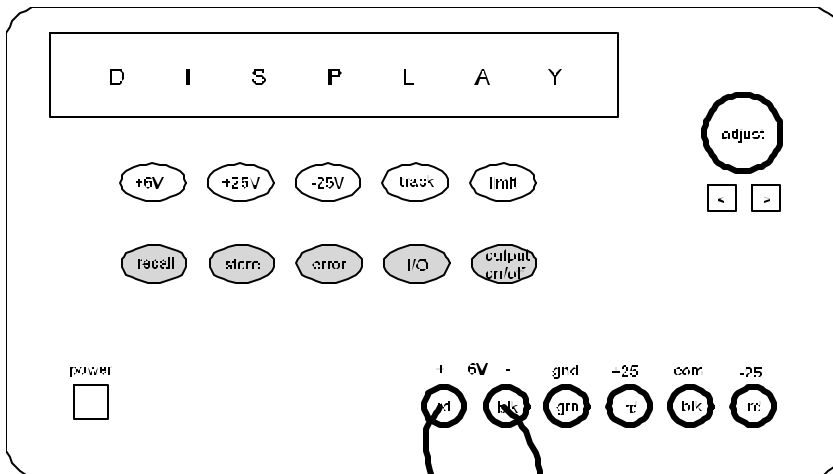
- i) How do the brightnesses of the three bulbs compare?
 - ii) Which bulb(s) draws the most current?
 - iii) What happens to the brightness of A and B when C is removed (that is, when C is replaced by an open circuit)?
 - iv) What happens to the brightness of B and C if A is removed?
2. Consider two light bulbs, each designed to have 110V across them. One has a power rating of 40 W and the other has a power rating of 75 W.
- i) Which bulb has the higher resistance?
 - ii) Which carries the greater current?

3. i) In the circuit below, how do the brightnesses of the bulbs compare with one another?
- ii) Suppose bulb A is removed. How do the brightnesses of the remaining bulbs change?



-confirm your predictions in 1-i), 1-iii) and 1-iv) (adjust $V=5V$)
 -confirm your predictions in 3-i) and 3-ii) (adjust $V=6V$)
see below and page 5 for wiring guides

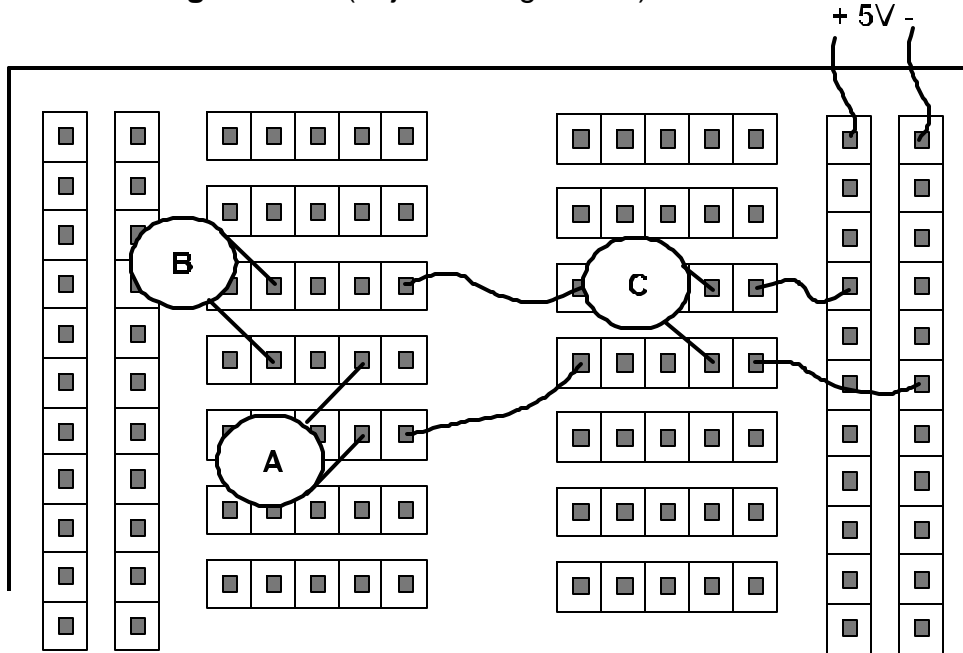
Power supply operation



+ 0 to 6V -

- Press power
- Select **+6V** (selects the 0 to +6V adjustable supply)
- Press **Output On/Off** (turns 0 to +6V supply on)
- Turn dial to adjust output voltage 0 to 6V

Breadboarding circuit 1 (adjust voltage to 5V)



Breadboarding circuit 3 (adjust voltage to 6V)

