Elements of Direct Current (DC) Circuits

Select two different resistors with similar (but not identical) values. Those values should be between: 80-10000 ohms:
Values: R_1 = _____ R_2 = _____
Measure in series: Rseries = _____ the theory is $R_1+R_2=R_s$ = _____ % diff = _____
Measure in parallel: Rparallel = _____ theory is: $R_p = R_1 \times R_2 / (R_1+R_2)$ = _____ % diff = _____
Now set DC power supply to a voltage (2-5 volts is fine) record: V = _____
Plug one resistor into breadboard. Ensure you know how to use the breadboard.
Next connect wires from the resistor to posts on breadboard.
Measure resistance across posts with the meter. Does it match resistance of the resistor alone? Yes / No (get help)
Remove meter and connect power supply to posts. Measure voltage across posts. Ensure it roughly equals value on power supply? Yes / No (get help)
Next, switch meter to measure current (miliamps) and measure current. I = _____
From ohm's law V = IR, compute what I should be: _____ %diff = _____
Switch to other resistor: I(measured) = _____
I(calc) = _____ % diff = _____

Connect two resistors in series.

Measure the voltage across each resistor.
V1 = _____ V2=_____ Does V1+V2 = V (of power supply?) Find a % difference=_____
What is the current: I(measured) = _____
I(calc) = V/Rs = _____ %diff = _____

Connect two resistors in parallel.

First, verify tha the voltage across each resistor is about equal to the voltage of the power supply: yes/no
Next, measure the current from the power supply: I(measured) = _____
I(calc) = V/Rp = _____ %diff = _____
Lastly, measure the current through each resistor separately (TRICKY):
I1 = _____ I2=_____ and last:
Check that I1+I2 = I(measure).

Things you should know before leaving lab, in the form of a basic circuit quiz:
1. Draw the symbol for each of the following: resistor, DC power supply, wire, voltmeter, ammeter, ohmmeter.
2. Draw three circuits demonstrating how to properly measure each of: voltage, current and resistance (one diagram for each).
3. What is the difference between objects connected in series and parallel? What is the same in each case? What differs?
4. Draw an ohmmeter measuring the resistance of two resistors in series, then another where an ohmmeter measure two resistors in parallel.
5. How is the breadboard connected? Which are connected across versus up and down?
6. Mathematically, how can resistors combine in series and parallel to form a single value? (Meaning: be comfortable using the resistor combination formula. In the future, a larger network will be given, and the task is to combine this into a single effective resistor.