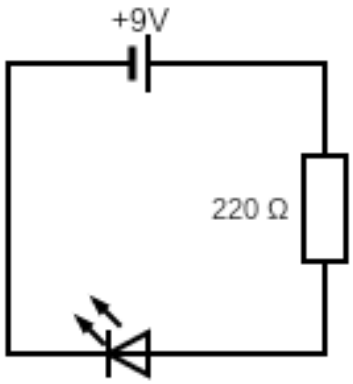
Basic Electronics Exercises: Resistor Circuits and Measurements

1. Basic Series Circuit

Setup:
- Build a circuit with a **9V source**, a **220Ω resistor**, and an **LED** (with series resistor for protection) like in the image below.



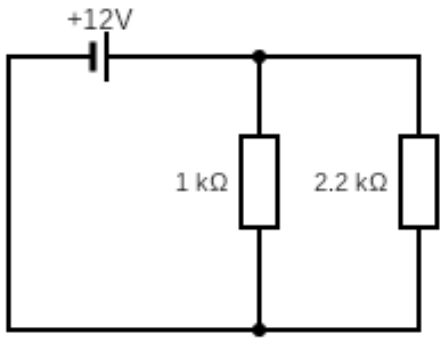
Tasks:
a) Calculate the theoretical current using Ohm's Law.

b) Measure resistance and voltage across the components using a multimeter.
c) Record values in a table:

Component	Measured Resistance (Ω)	Measured Voltage (V)	Theoretical Current (mA)
Resistor			
LED			
Whole Circuit			

2. Parallel Circuit

Setup:
- Build a circuit with a **12V source** and two parallel resistors: **1kΩ** and **2.2kΩ**.



Tasks:
a) Calculate the equivalent resistance [1 / R_{EQ} = 1 / R_1 + 1 / R_2].

b) Measure the equivalent resistance with the multimeter (**power off!**).

c) Measure resistances and voltages, and compare with calculated values.
d) Calculate total current and current through each resistor.
e) Record values in a table:

Component	Measured Resistance (Ω)	Measured Voltage (V)	Theoretical Current (mA)	Measured Current (mA)
R1				
R2				
Whole Circuit				