Course and Section_____ Names _____

Date_____ _____

SIMPLE CIRCUITS EXPERIMENT

Introduction

In this experiment you explore circuits obtained with various combinations of light bulbs.
You will also compare different forms of energies and their relations.

Equipment

Power supply, three 12 V light bulbs, Genecon generator, fan motor, five banana cables.

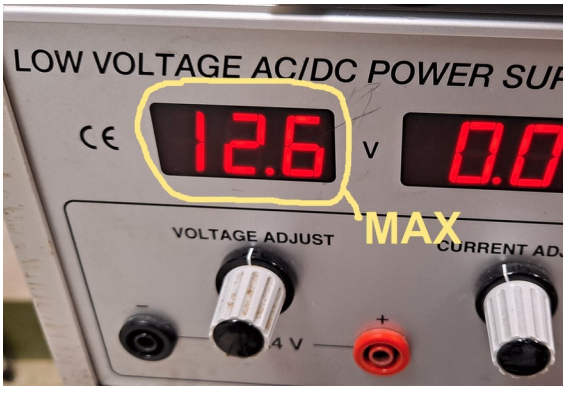
Preliminary questions

1. Describe the analogy between fluid flow and electric circuits. What electrical quantity corresponds to?

Fluid Flow	Electric Circuit
Pipes	
Water flow	
Pressure	
The pump	
Turbine	
Faucet	

Procedure

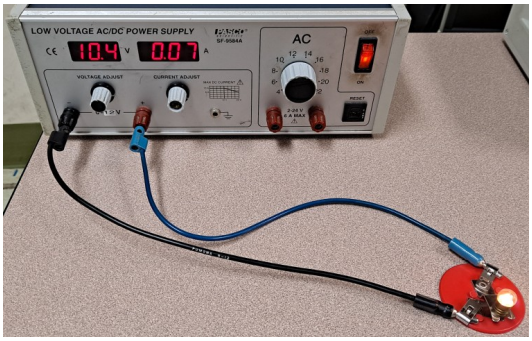
Warning: if you are using the 0-24 V power supply <u>do not exceed</u> an output voltage of 12 volts.



A output voltage above 12V will most likely result in the explosion of the light bulb. Please don't.

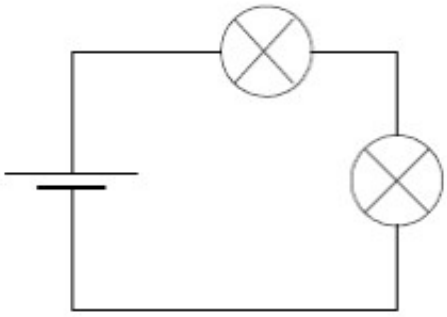
PART 1 – Light bulbs

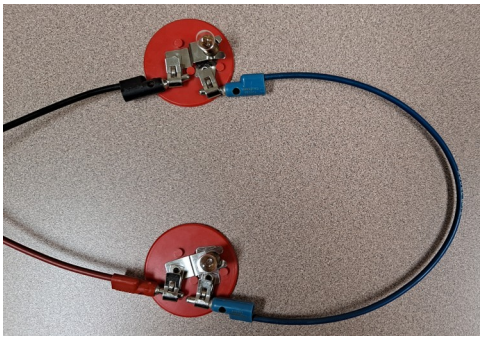
Step 1. Take one light bulbs and connect it to the DC power supply. Use two banana cables.



2. Vary the output voltage from 0 V to 12 V. How does the brightness of the bulb changes?

Step 2. Take a second light bulb and connect it series with first bulb, then to the power supply.





3. Vary the output voltage from 0 V to 12 V. How does the brightness of the light bulb changes?

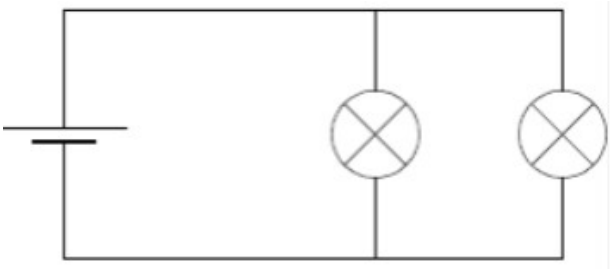
Step 3. Set the output voltage to 12 V.

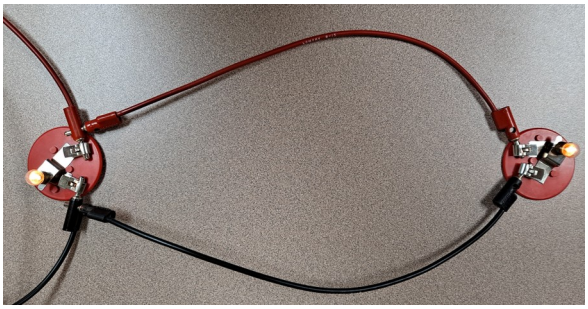
4. Do the two light bulbs glow with the same brightness?

5. How does the brightness of two light bulbs compare to the circuit of Step 1 at 12 V?

6. What happens if you unscrew one bulb?

Step 4. Connect the two lights bulbs in parallel, then to the power supply. Set 12 V





7. Do the two light bulbs glow with the same brightness?

8. How does the brightness of the two light bulbs compare the circuit of Step 1 at 12 V?

9. How does the brightness of the two light bulbs compare the circuit of Step 2 at 12 V?

10. What happens if you unscrew one bulb?

Step 5. Connect three lights bulbs in parallel, then to the power supply. Set 12 V

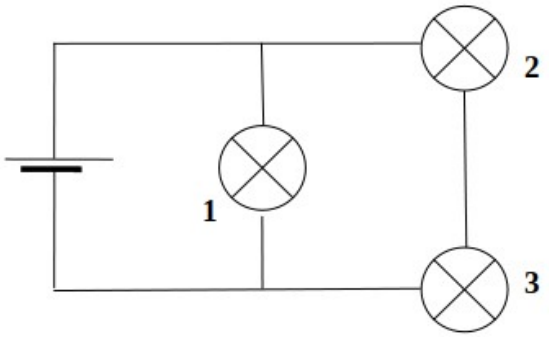
11. Do the three light bulbs glow with the same brightness?

12. How does the brightness of the three light bulbs compare to circuit of Step 3 at 12 V?

13. Suppose you're using a 1.5V battery instead of the power supply and you perform two experiments: first you connect the three light bulbs in series with the battery, and then in parallel. Compare the brightness of the two circuits.

14. Which effect the two different circuits would have on the battery?

Step 6. Connect light bulb 1 in parallel with the series combination of light bulb 2 and 3, then to the power supply. Set 12 V



15. Do all light bulbs glow with the same brightness? Describe.

16. What happens to the other two light bulbs if you unscrew one of the following?

light bulb 1	
light bulb 2	
light bulb 3	

17. Which light bulb(s) is using the least amount power?

PART 2 – Genecon generator

Step 1. Connect the Genecon generator to one light bulb.

18. Spin the Genecon generator and describe the brightness of the light bulb.

19. What happen if you spin the Genecon generator the other way around?

20. Is the Genecon generator *producing* energy or *transforming* energy?

21. Which kind of energy is transformed into which other kind of energy by Genecon generator?

22. Which kind of energy is transformed into which other kind of energy by the light bulbs?

Step 2. Connect the Genecon generator to fan motor.

23. Spin the Genecon generator and describe the motion of the fan.

24. Can you vary the motor's speed?

25. What happen if you spin the Genecon generator the other way around?

26. Which kind of energy is transformed into which other kind of energy by the fan motor?

TURN OFF YOUR POWER SUPPLY