

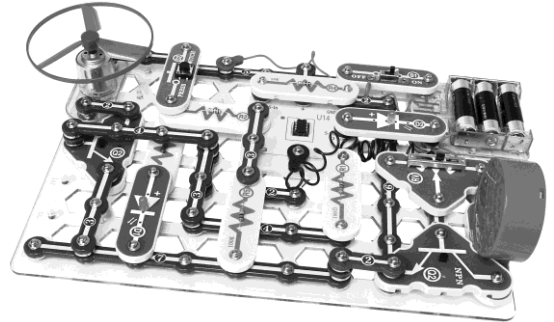
Lab: “Snap Circuits”

CHAPTER 34: ELECTRIC CURRENT

Directions: You will utilize “Snap Circuits” kits to construct a number of different circuits which include switches, lights, motors, resistors, LEDs, alarms, etc. Make sure you follow the procedure carefully!

Procedure:

1. Forms groups of 4 students
2. Get one Snap Circuit kit for you group (check to make sure everything is there. Look at Snap Circuits Block Layout handout in box) If something is missing, report it to your teacher.
3. Review pages 1-5 in “Electronic Snap Circuits” handbook inside box. Pay particular attention to page 5 (The DO’s and DON’Ts of Building Circuits)
4. Complete each of the following Projects listed below from the Snap Circuits handbook.
5. When you are completed, make sure that all components are placed in their designated space in the box and return it to your teacher for inspection.



PROJECTS: You will complete the following Projects in this order: Put a Check on the line when you have completed that task.

_____ #1: Electric Light and Switch

_____ #2: DC Motor and Switch - PLEASE USE PRESS BUTTON SWITCH INSTEAD OF SLIDE SWITCH

- Why? Because sometimes the fan comes loose from the motor and literally slices off the slide switch. OUCH! And watch your fingers too!

_____ #5: Lamp and Fan in Series

- Try this: Unscrew the bulb when you turn it on. What happens?
- Try this: Use either the black or the red “wire” and put it on either side of the light bulb. Ask yourself: Why does the fan suddenly increase in speed but the light bulb go dark?

_____ #6: Lamp and Fan in Parallel

- Try this: Unscrew the bulb when you turn it on. What happens?

_____ Variation on #5: Put two lamps in series.

- What do the brightness of each bulb look like? (in other words, which one is brighter - or are they both the same brightness?)
- Unscrew one of the bulbs. What happens?

_____ Variation on #6: Put two lamps in parallel.

- What do the brightness of each bulb look like? (in other words, which one is brighter - or are they both the same brightness?)

- Unscrew one of the bulbs. What happens?

_____#11: Flying Saucer (watch out, when it takes off, it could hit you in the face!)

_____#12: Decreasing Saucer Lift

_____#13: Two-Speed Fan

_____#17: Alarm Circuit

_____#18: Laser Gun

Questions:

1. Refer to #5 and #6: Which one had the fan going faster? (circle one) *Series or Parallel*
2. Refer to variation on #5 and #6: Which one had the brighter lights? (circle one) *Series or Parallel*
3. In your house, do you think your lights are wired in series or parallel? (explain)
4. Why does the flying saucer take off if the direction of the fan snap-piece in the circuit is one way, but doesn't take off (acts like a fan) if the direction is reversed? (explain)
5. Does it matter which way the direction goes for the light bulb? (does it behave differently when you reverse the light bulb?)
6. What does the resistor do to the Alarm circuit (#17) to make the Laser gun (#18)? (explain)
7. Which configuration do you think would make the batteries run down (die) quicker? (circle one)
Series or parallel
8. Why do you think the lights in your house dim slightly (momentarily) when you switch on a hair dryer or a vacuum cleaner? (explain)

9. Without the resistor, the Alarm is louder. So answer this question: Do appliances with LOW resistance use more or less current?
10. Which of the following appliances do you think has the LOWEST resistance? (circle one)
- a. *Vacuum cleaner*
 - b. *iPod plugged into the recharging station*
11. Appliances with LOW resistance will (circle one)
- a. *Tend to get hotter than those with high resistance*
 - b. *Tend to be cooler than those with high resistance*
12. How much voltage comes out of a household wall socket? Look on Google if you don't know. (circle one)
- a. *10 Volts*
 - b. *110 Volts*
 - c. *220 Volts*
 - d. *1000 Volts*
13. What does a transformer do? (look on Google if you don't know)
14. When you plug in a lamp, it plugs directly into the wall. When you plug in your cordless phone, there is usually a big box plug that goes into the wall (it is called a Transformer). That big box plug gets warm (and sometimes it even "hums"). Why do you need a transformer for your cordless phone, but for your lamp, you don't?
15. What is causing the heat from that transformer?
16. Do you think that there is probably a limit to the amount of bulbs in parallel you could hook up to the two batteries in this kit before they wouldn't light? (circle one) *Yes or no*
17. Do you think that there is probably a limit to the amount of bulbs in parallel that you could hook up in your house before they wouldn't light? (circle one) *Yes or no.*
- If yes, would it be significantly more than the number you could hook up to a battery?
18. As more appliances are added to the circuit, what happens to the wires carrying the current to those appliances? (circle one)
- a. *Nothing*
 - b. *they get cold*
 - c. *they get hot*
19. How is your house protected from drawing too much current into the house so that the wires don't overheat (oops, did I just give away the answer to #18?)
20. What is the purpose of a bi-metallic strip in a circuit breaker? (You might need to look this up on Google or in your textbook.