Name: _____ Date: _____

CONTENT 20.2

20.2 Open and Closed Circuits

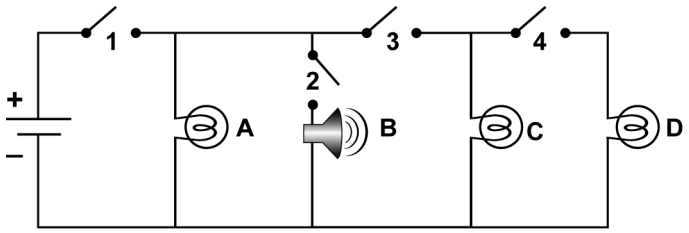
READ

Where is the current flowing?

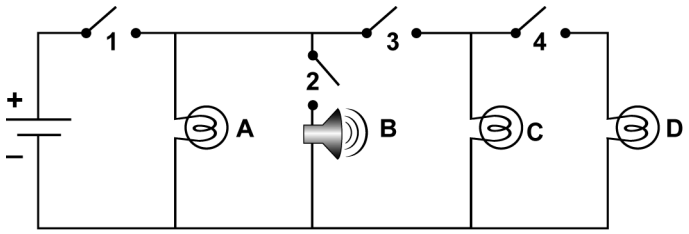
You have built and tested different kinds of circuits in the lab. Now you can use what you learned to make predictions about circuits you haven't seen before. Use the circuit diagrams pictured below to answer the questions. You may wish to write on the diagrams in order to keep track where the current is flowing. As a result, each diagram is repeated several times.

PRACTICE

1. Which devices (A, B, C, or D) in the circuit pictured below will be *on* when the following conditions are met? For your answer, give the letter of the device or devices.

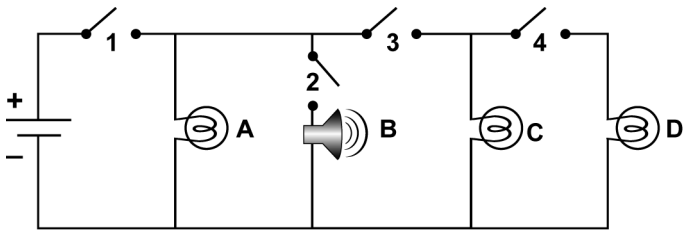


   a. Switch 3 is open, and all other switches are closed.
   b. Switch 2 is open, and all other switches are closed.
   c. Switch 4 is open, and all other switches are closed.

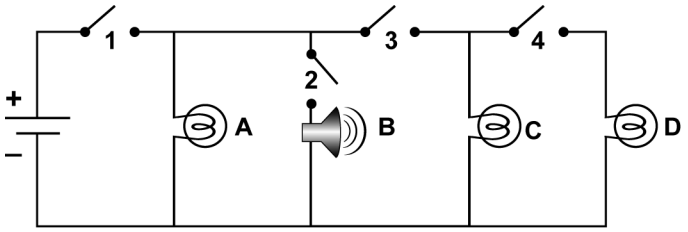


   d. Switch 1 is open, and all other switches are closed.
   e. Bulb C blows out, and all switches are closed.
   f. Bulb A blows out, and all switches are closed.

   .



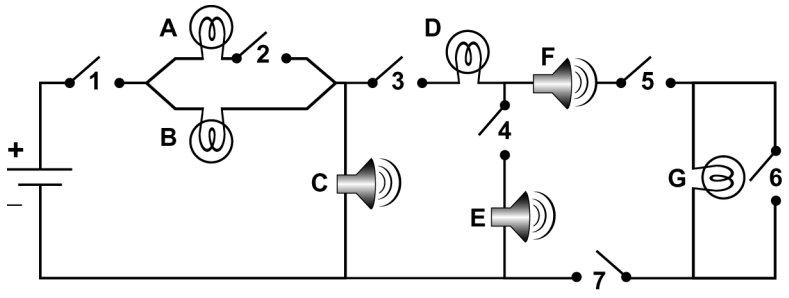
   g. Switches 2 and 4 are open, and switches 1 and 3 are closed.
   h. Switches 2 and 3 are open, and switches 1 and 4 are closed.



i. Switches 2, 3, and 4 are open, and switch 1 is closed.

j. Switches 1 and 2 are open, and switches 3 and 4 are closed.

2. Which of the devices (A-G) in the circuit below will be *on* when the following conditions are met? For your answer, give the letter of the device or devices.



a. Switch 5 is open, and all other switches are closed.

b. Switch 6 is open, and all others are closed.

c. Switch 7 is open, and all others are closed.

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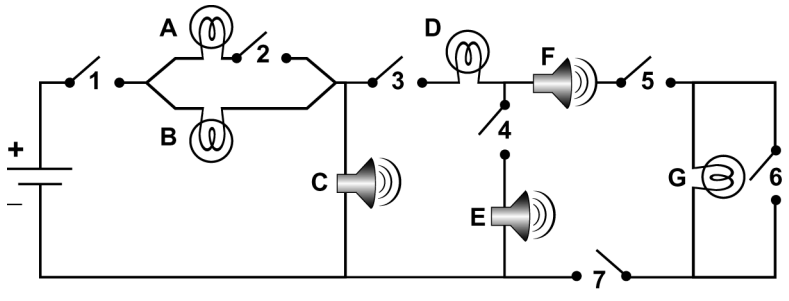
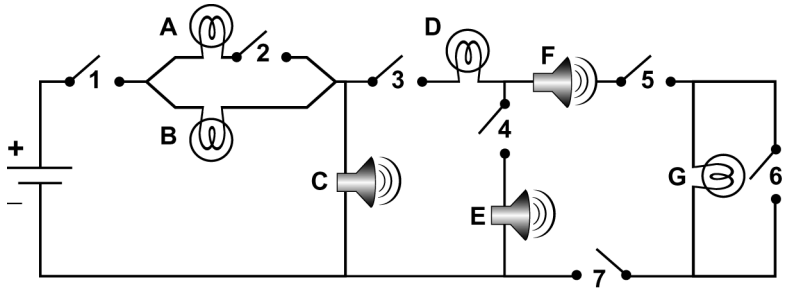


d. Switch 4 is open, and all others are closed.

e. Switch 3 is open, and all others are closed.

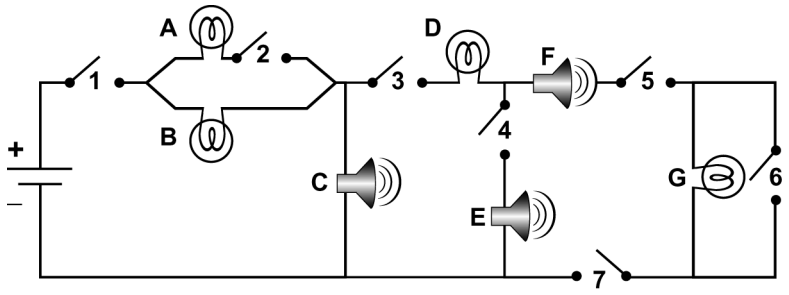
f. Switch 2 is open, and all others are closed.



g. Switch 1 is open, and all others are closed.

h. Switches 2 and 4 are open, and all others are closed.

i. Switches 4 and 6 are open, and all others are closed.

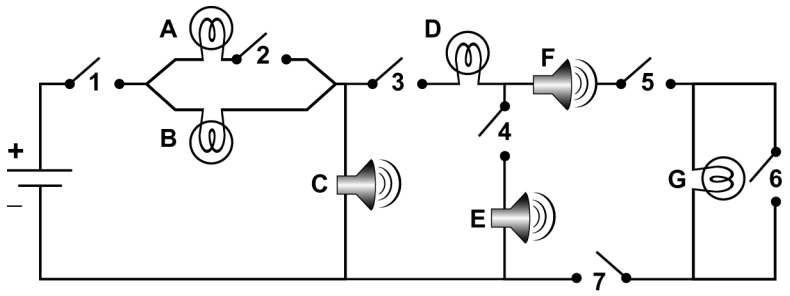


j. Switches 4 and 7 are open, and all others are closed.

k. Switches 5 and 7 are open, and all others are closed.

l. Switches 2 and 3 are open, and all others are closed.

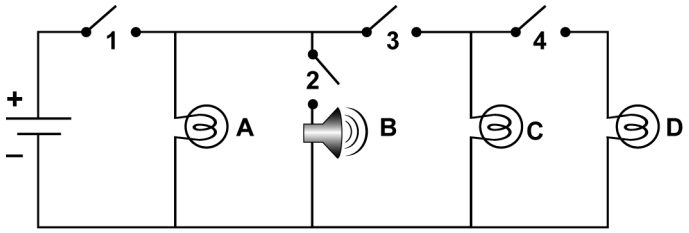
m. Bulb D blows out with all switches closed.

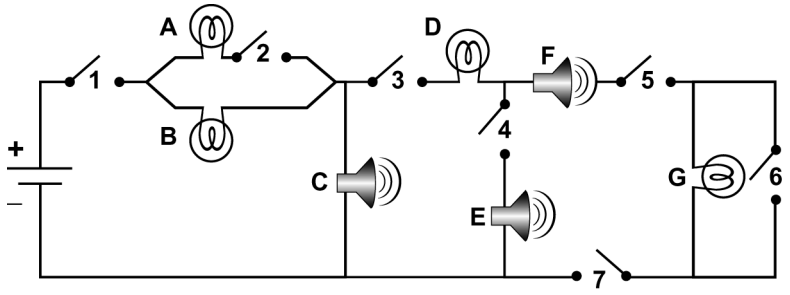


n. Bulbs A and B blow out with all switches closed.

o. Bulbs A and D blow out with all switches closed.

3. Use arrows to draw the direction of the current in each of the circuits below. Make sure to show current direction in all paths of the circuits within each diagram.





4. How many possible paths are there in circuit diagrams in questions (1) and (2)?

5. Draw a circuit of your own. Use one battery, show at least 4 devices (bulbs and bells), and divide the current at some point in the circuit. Finally, use arrows to show the direction of the current in all parts of your circuit.