2017 SH2 H2 Physics

D.C. Circuits - Foutan Board

Name: _____ Class: _____ Date: _____

Activity 1: You are to predict the switch positions on a picture of the Foutan board in Fig 1 which would be needed to light certain bulbs. The predictions are then tested using the Foutan Board.

Fig 1 below shows a circuit diagram of a Foutan Board.

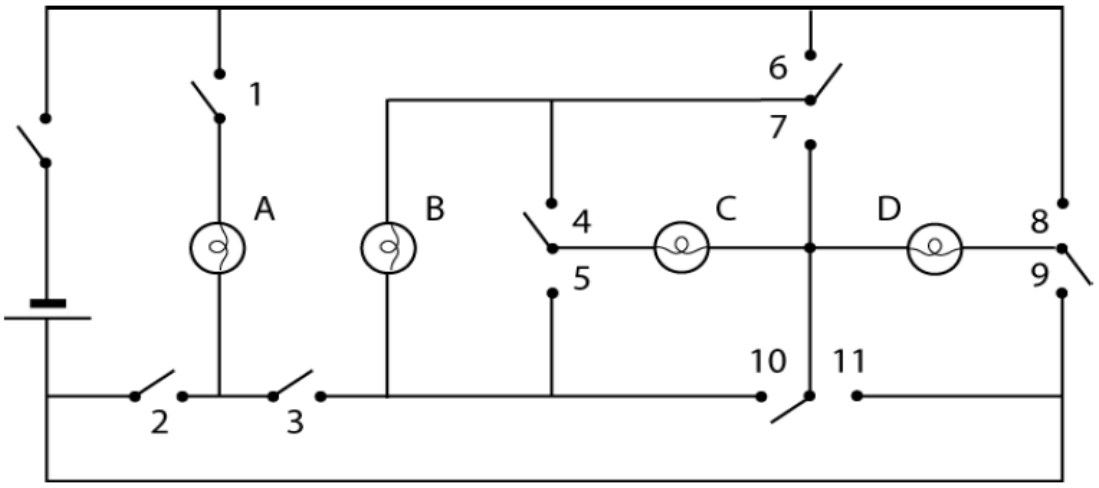

Fig 1

For each task in Fig 2 below, do the following:

a. Check the switches you will close to accomplish the task and place an 'x' in the corresponding box, using the circuit diagram in Fig 1.

b. After you have completed Fig 2, check your predictions with the Foutan Board provided.

c. Compare the actual result to your original predictions.

		Closed switches (Prediction)										
	Lighted bulbs	1	2	3	4	5	6	7	8	9	10	11
1	**B only**											
2	**A & B in series**											
3	**B & D in series**											
4	**A & D in parallel**											
5	**B & C in parallel**											
6	**A, B & C in series**											
7	**A, B, & C in parallel**											
8	**A, B, C & D in series**											
9	**A, B, C & D in parallel**											
10	**B, C & D in series**											
11	**B, C & D in parallel**											
12	**A, C & D in series**											
13	**A, C & D in parallel**											
14	**A, B, & C in series & D in parallel with them**											
15	**B, & C in series & A in parallel with them**											
16	**A & B in parallel & C in series with them**											
17	**A, B & C in parallel & D in series with them**											
18	**C & D in series with A & B in parallel**											
19	**A & D in series with B & C in parallel**											

Fig 2

Activity 2

a. Draw a simplified **schematic** (not physical) circuit diagram for each of the following Fountan Board.

Circuit #14 (lamps A, B & C in series & D in parallel with all of them)	Circuit #19 (lamps A & D in series and B & C in parallel)

b. How can you tell by looking whether two identical lamps are arranged in series? In parallel?

c. How can you test whether two lamps are arranged in series? in parallel?

d. Assuming bulb A has more resistance than bulb B which has more resistance than bulb C, describe the voltage, current and brightness in each lamp in circuit #7 (lamps A, B & C in parallel).

e. What happens to the total current in circuit #7 when one of the lamp is removed? Explain why.

f. When the correct switches are closed to create circuit #9 (lamps A, B C & D in parallel), all four lamps light up. What happens in the circuit if lamp B is unscrewed?

g. If you could add one more bulb to circuit #9 (creating a 5 identical bulbs in parallel circuit), describe what would change when the circuit is connected.