

# ELECTRICAL CIRCUITS

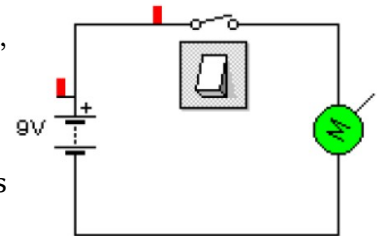
## ELECTRICAL PRACTICES WITH CROCODILE CLIPS

The circuits below have been designed using the Crocodile Clips program, so the symbols used may differ from the ones we studied in class.

Answer the following questions in your notebook:

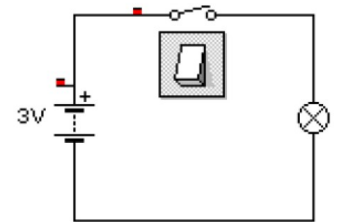
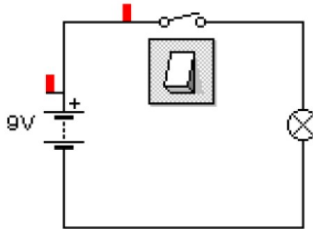
1. For the circuit provided:

- a) What are the names of the elements in the circuit?
- b) What type of component is each of them (power source, conductor, control component or load device)?
- c) Is the motor currently working?
- d) Why or why not?
- e) Does the motor operate when the switch position is changed?
- f) Why or why not?



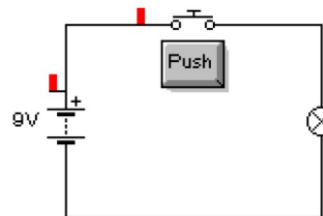
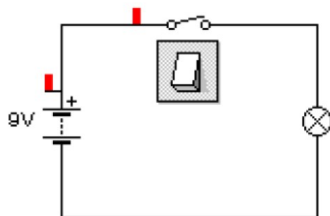
2.

- a) What is the difference between the two circuits shown to the left?
- b) Do you think the lamp will function differently in each circuit?
- c) Why do you think that is?



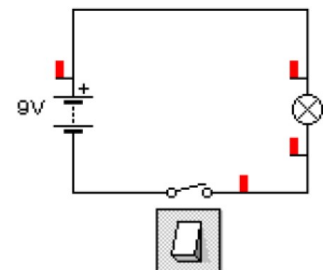
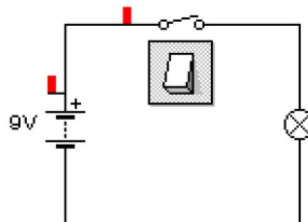
3.

- a) What elements differ between the circuits provided?
- b) How do these two elements operate differently?



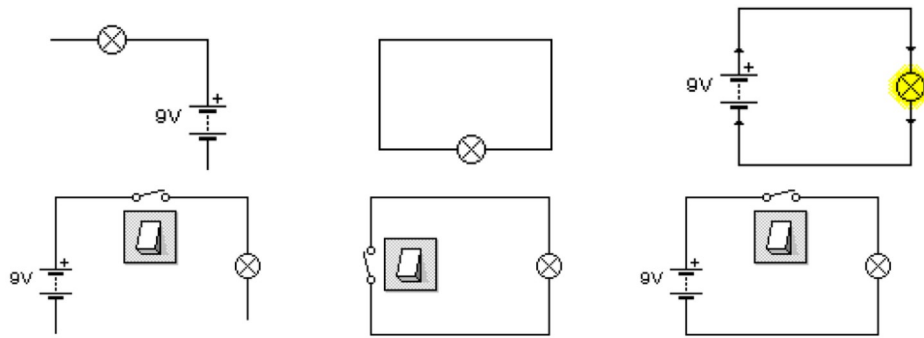
4. Is there any difference in how the two following circuits work?

- a) Is the position of the switch in a circuit important?
- b) Why?

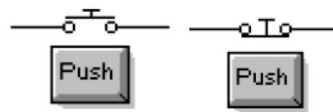


5.

- a) Analyze each of the following circuits. Will they function properly?  
 b) If you identify any issues with any of them, explain the reason for the problem:

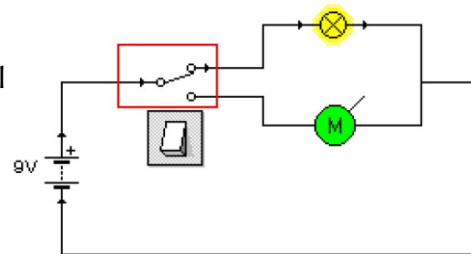


6. What is the difference in how these two control elements operate?



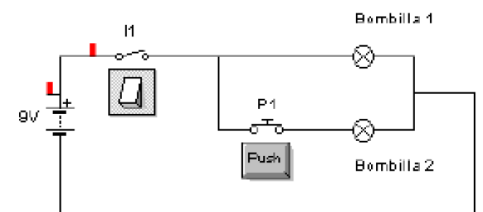
7. In the following circuit:

- a) What is the name of the control component inside the red rectangle?  
 b) Explain how the circuit functions.

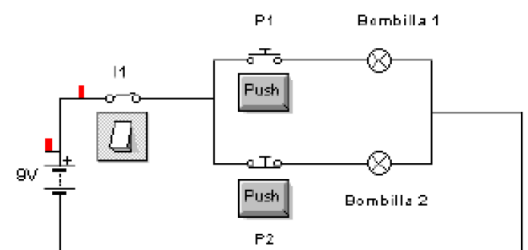


8. What control component must be clicked or pushed to turn on the loads in each of the following circuits?

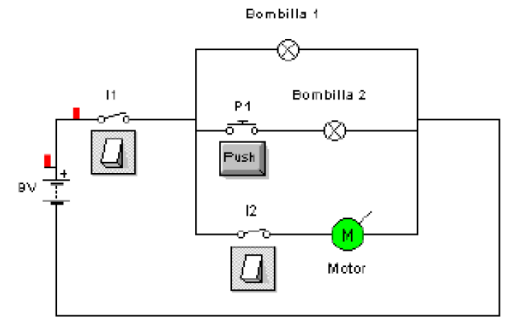
To switch on ...	..... need to be clicked/pushed
lamp 1	
lamp 2	
Both of them	



To switch on ...	... need to be clicked/pushed
lamp 1	
lamp 2	
Both of them	

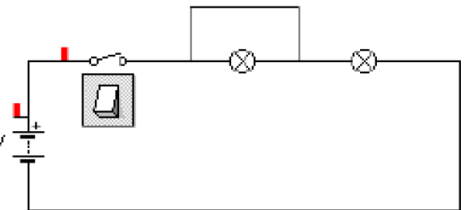


To switch on ...	... need to be clicked/pushed
lamp 1	
lamp 2	
Motor	



9. Draw the following circuits:
- A circuit with a 9-volt battery, a normally open (NO) push button, and two lamps that illuminate simultaneously when the switch is pressed.
  - A circuit with a 9-volt battery, a general switch to turn everything on/off, and a two-way switch to select between a motor or a buzzer.
  - A circuit with a 6-volt battery and two NO push buttons: one of them used to turn on a lamp when pressed, and the other to activate a motor when pressed.
  - A circuit with a 9-volt battery, a normally closed (NC) push button, and three lamps turn off simultaneously when the control component is pressed.

10. A short circuit is an accidental connection between the two terminals of an element. In the following circuit there is a short circuit in one of the lamps.

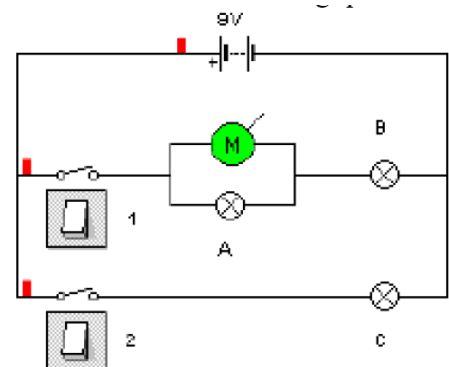


- Explain what will happen in the circuit when the switch is turned on.
- What would happen in the circuit if the short circuit were eliminated?

11. Using a battery, a momentary push (PTM) switch, a standard switch, a buzzer and a lamp, draw a circuit in which the buzzer sounds when the PTM switch is pressed, and the standard switch controls the lamp on/off.

12. Answer the following questions about the circuit. What happens if ...

- You close only switch 1?
- You close only switch 2?
- You close both switches 1 and 2?



(These activities are adapted from a document by Manuel Torres. You can access to it in <http://elprofesormanuel.wordpress.com/2011/01/27/crocodile-clips-tecnologia-3%C2%BA-e-s-o/> )