

## 1. Worksheet: Electric current, battery and bulb

### 1.1 Activity 1-1 How torch works

The torch is a very simple electric circuit. Try to find out how it works, build up your own electric circuit and try to design a simple electric device.



1. Dismantle the torch and examine its components. What are they?
2. Draw a circuit diagram for the torch. Mark the current direction.
3. Label each torch component and describe its function.
4. Check the material of the torch case. What is it made of? Is it a part of the circuit?
5. Put the torch back to its initial shape.
6. Build your own simple electric circuit that makes the bulb light up. Check the bulb parameters first. Sketch the circuit diagram.

## 1.2 Activity 1-2 Construct a simple electric device

Now you know how to construct a simple electric circuit that lights up a bulb. Now try to design a simple electric device. You can use extra switches, wires and bulbs. You can use these materials:

- Three bulbs (e.g. 4,5V/0,3A), zinc-carbon battery (4,5V), leads, one-way (single-pole-single-throw) switch, two-way (single-pole-double-throw) switch, double-pole-double-throw switch

Invent and construct the electric circuits according to the description. In order to understand how the more complicated switches work, look up the information at <http://en.wikipedia.org/wiki/Switch>

1. Christmas tree lights: You want to light up your Christmas tree with three bulbs. What happens if one of the bulbs fails? Connect them the way that if one of the bulbs fails, the other two are still lit. Sketch the circuit diagram.
  
2. Lighting a tunnel: A person walking through the tunnel turns a lamp in the first half of it and then he turns a second lamp for the second half of the tunnel and the first one is turned off. Connect the two bulbs the way it works according to the description. Sketch the circuit diagram.
  
3. Entry and exit light switches: There is a lamp in a tunnel. Light switches are at both tunnel entrances. Either switch turns the light in the tunnel on and off. Connect the circuit the way it works according to the description. Sketch the circuit diagram.

