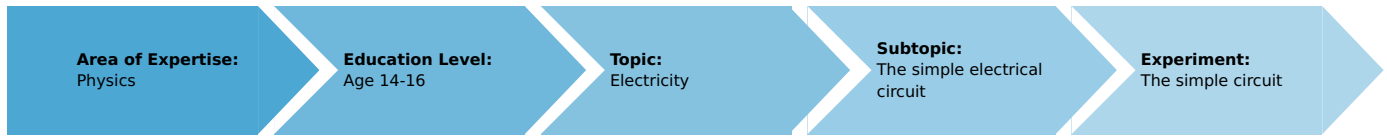


# The simple circuit (Item No.: P1380100)

## Curricular Relevance



**Difficulty**



Easy

**Preparation Time**



10 Minutes

**Execution Time**



10 Minutes

**Recommended Group Size**



2 Students

**Additional Requirements:**

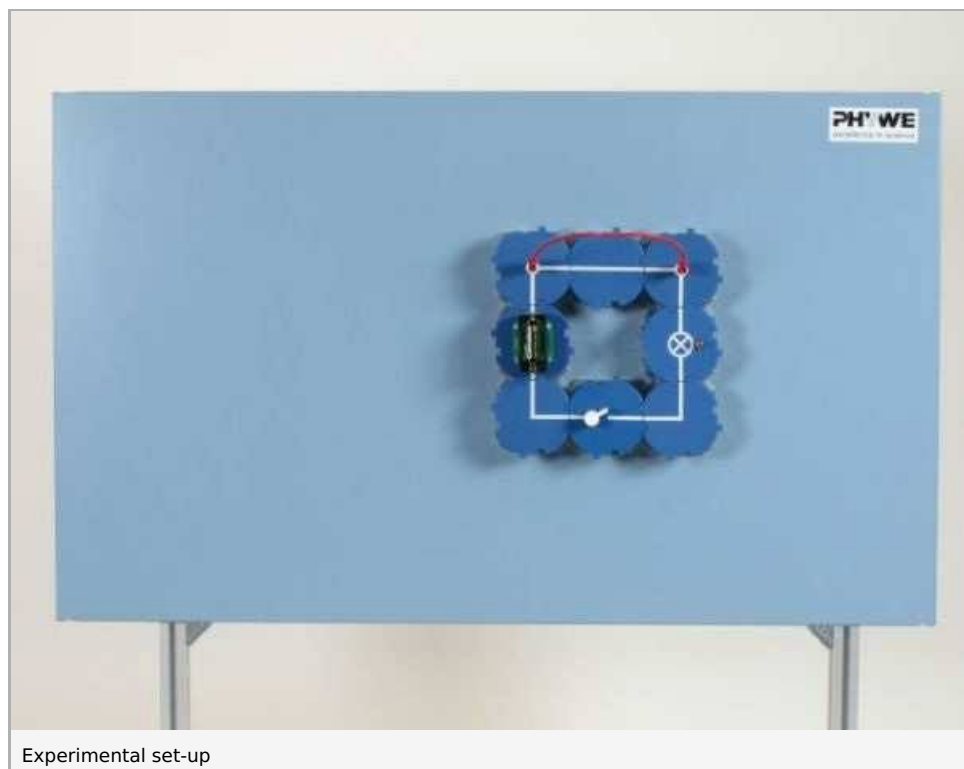
**Experiment Variations:**

**Keywords:**

## Principle and equipment

### Principle

This experiment is to demonstrate which components are required for a simple circuit, and under which conditions electric current will flow.



## Equipment

Position No.	Material	Order No.	Quantity
1	Demo Physics board with stand	02150-00	1
2	Switch on/off, module DB	09402-01	1
3	Socket for incandescent lamp E10 ,module DB	09404-00	1
4	Connector interrupted, module DB	09401-04	1
5	Electr.symbols f.demo-board,12pcs	02154-03	1
6	Connector, straight, module DB	09401-01	1
7	Connector, angled, module DB	09401-02	2
8	Connector, angled with socket, module DB	09401-12	2
9	Battery holder module (C type), SB	05605-00	1
10	Filament lamps 1.5V/0.15A,E10,10 pieces	06150-03	1
11	Connecting cord, 32 A, 250 mm, red	07360-01	1
12	Battery cell, 1.5 V, baby size, type C	07922-01	1

## Set-up and procedure

- Connect up the circuit as shown in Fig.1; the lamp serves to detect electric current; the switch should be open to start with.
- Repeatedly close and open the switch, observing the lamp while doing so (1).
- Remove the battery box from the circuit, close and open the switch while observing the lamp (2); plug the battery holder back in the circuit.
- Exchange the positions of the switch and the lamp, close and open the switch; after this, turn the battery box round to reverse the polarity of the battery and operate the switch; in each case observe the lamp and watch for any change in its brightness (3)
- Remove the straight connector module from the circuit and operate the switch; then bridge the gap with the connecting cable and again operate the switch; in each case observe the lamp (4)



Fig. 1

## Observation and evaluation

### Observation

1. The lamp only lights up when the switch is closed.
2. The lamp does not light up without the battery.
3. The lamp lights up with the same brightness when the switch is closed, regardless of the succession of the components or polarity of the battery.
4. The lamp only lights up when the circuit is unbroken.

### Evaluation

The following components belong to a simple electric circuit; a battery, an electrical appliance (e.g. a filament lamp), a switch and connecting leads. An electric current can only flow when the circuit is closed, i.e. in this case when the terminals of the current source are separately and conductively connected to the two filament lamp connections.

Neither the succession in which the components are connected, nor the polarity of the source of current, are hereby of importance. The function of the switch is to either close the circuit or break it. The filament lamp serves here both as an electrical appliance and to detect a flow of current. The battery is the current source.

### Remarks

In this experiment, a circuit is set up which has neither a connection in series, nor a connection in parallel, of electrical devices (energy converters), and is therefore named a simple circuit.

The students are to be introduced to simple electrical components; they should memorize their functions and symbols and become capable of reading and working with circuit diagrams. We recommend that the term current source be used at the beginning of lessons on electricity, as it is more illustrative than the term voltage source, to which the students should be introduced later, when they are capable of understanding it.