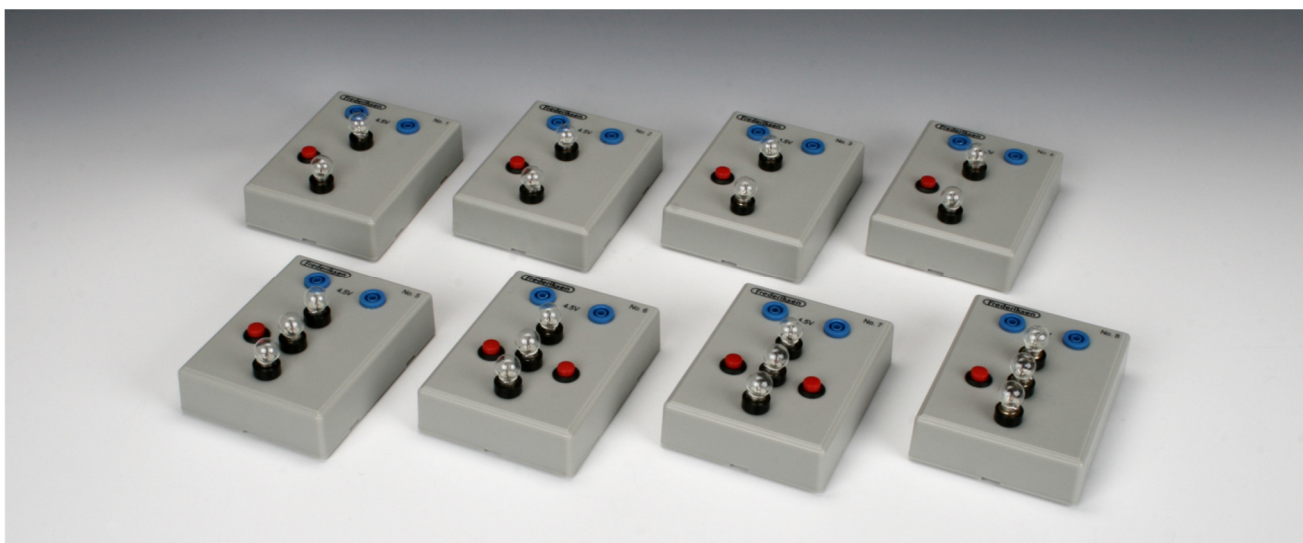


Experiment number	136040-EN	Topic	Electricity. Series and parallel connections		
Version	2018-06-20 / HS	Type	Student exercise	Suggested for grade 9-11	p. 1/2



## Objective

The eight secret circuit boxes contain circuits with switches and incandescent lamps (bulbs).

Investigate one box at a time and draw the schematics diagram (wiring diagram) for the circuit inside.

## Principle

Connect box No. 1 to a 4.5 V battery or a power supply adjusted to 4 V.

Observe the lamps – both with the switch closed (pushed down) and open. In case of more than one switch, you must go through all combinations of open and closed.

Try to unscrew one or more of the bulbs – and again: Test every possible combination of switches and bulbs.

Based on a guess, draw a sketch of the circuit – and test if the real circuit behaves as you can predict from the sketch.

When the riddle is solved, draw a nice schematics diagram (see symbols below) – and continue with the next box.

## Equipment

429800 Secret circuit boxes

105723 Safety cables, 50 cm, blue – (Qty. 2)

- Plus *either*:

350555 Battery 3R12 4,5 V

Crocodile clips (e.g.. 109000) – (2 stk.)

- *or*:

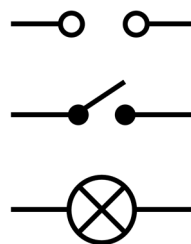
361600 Power supply 12 V AC/DC 3A

(or another power supply)

## Schematics symbols

Below you find from top to bottom:

- Sockets (connection to power supply)
- Switch
- Bulb



**Solution sheet**

<b>1</b>	<b>2</b>	<b>3</b>
<b>4</b>	<b>5</b>	<b>6</b>
<b>7</b>	<b>8</b>	<b>Name:</b>  _____  <b>Class:</b>  _____