

### The scenario

<b>Subject</b>	<b>Electromagnetism / Series and parallel circuits</b>
<b>Length</b>	4:10
<b>Main goals</b>	Get familiar with series and parallel electrical connections
<b>Detailed goals</b>	to show that voltage divides into several devices in series connection and switching off one of them will brake circuit; to show that voltage is the same in parallel connection and switching off one of them will make no change in the rest of the circuit
<b>Structure and description of experiments:</b>	
<b>1. Introduction</b>	Everyday life has plenty of examples of parallel connections and so few of series. We will show both of them with differences.
<b>2. Main subject</b>	Series and parallel circuits
<b>Experiments</b>	<ol style="list-style-type: none"> <li>1. We put 3 lightbulbs with the same power ratings in parallel and show that each one shines independently.</li> <li>2. We put those 3 lightbulbs in series and show that: 1) they shine less, which confirms that applied voltage divides into all of them equally; 2) removing any of them will cause the rest to switch off.</li> <li>3. Now we use 3 lightbulbs with different power ratings; in parallel connection they shine as the ratings read (each one is stated for 230 V).</li> <li>4. Now we make connection in series – surprisingly, the lowest rated bulb shines the most, the highest – emits no light. But there is still current flowing through it, what we show by removing it from the circuit, which is then open and none of the lamps shine any more.</li> </ol>
<b>3. Summary, evaluation and remarks</b>	<p>In each case described above a question can be stated: will the bulbs shine? Which one, if not all? Which will shine the most and which the least?</p> <p><b>Level:</b> primary school and secondary school</p>