

<b>Main Topic</b>	Electricity
<b>Subtopic</b>	Circuits
<b>Learning Level</b>	High
<b>Technology Level</b>	Low
<b>Activity Type</b>	Student

Description: Use the Genecon and mini bulb bases to set up a series circuit and characterize properties of current flow in such a circuit.

Required Equipment	Genecon, 4 mini bulb bases, 4 mini bulbs, alligator leads
Optional Equipment	Voltmeter, Ammeter

This lab is excerpted from the Genecon Experiment Manual, from Arbor Scientific's Complete Genecon Experiment Set (P6-2635).

### Educational Objectives

- Characterize certain properties of series circuits.

### Concept Overview

Several properties of a series circuit will be demonstrated in this experiment. The primary concepts to be covered are:

1. Lamps in series reduce current flow.
2. Lamps in series increase the total resistance of the circuit.
3. The voltage across each bulb in a series circuit decreases as the number of bulbs in the circuit increases.

### Lab Tips

As always, when just one bulb is connected to the Genecon, turn the handle carefully to avoid burning out the bulb.

# Series Circuits

Name: \_\_\_\_\_

Class: \_\_\_\_\_

## Goal:

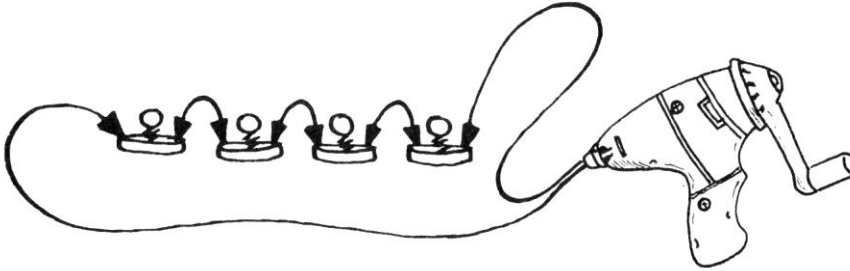
- Characterize certain properties of series circuits.

## Materials:

Genecon, 4 mini bulb bases, 4 mini bulbs, alligator leads

## Procedure:

1. Connect the Genecon to the four bulbs in bases, using alligator leads as illustrated:



2. Turn the handle at a specific rate, enough to light all four bulbs. Note the brightness of each bulb. Note how much effort is required to turn the handle. The force required to turn the handle is proportionate to the energy required to light the bulbs.
3. Remove one bulb from the circuit, reconnect the wires, and repeat the experiment at the same rate of turning. Again note the brightness of the bulbs. Are they brighter or dimmer than before? Why?

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4. Was the handle easier or harder to turn? \_\_\_\_\_
5. Which exercise used more energy? \_\_\_\_\_
6. Remove another bulb and repeat. Describe the brightness, force needed to turn, and energy used.

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7. Repeat with a single bulb. (Take care not to burn out the bulb.) Describe the brightness, force needed to turn, and energy used.

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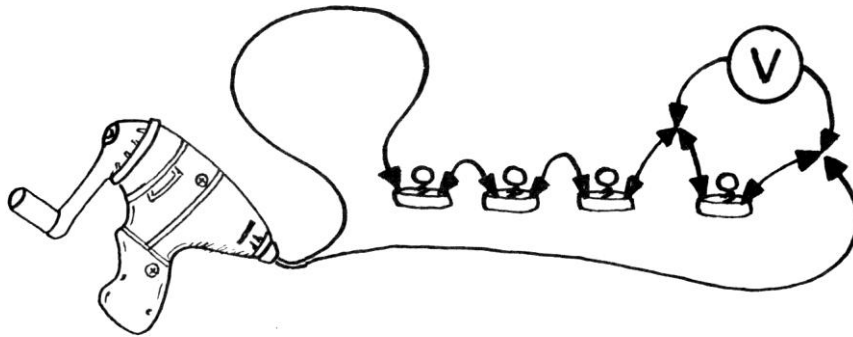
# Series Circuits

Name: \_\_\_\_\_

Class: \_\_\_\_\_

## Optional Experiments

8. Connect a voltmeter across one of the bulbs and repeat the experiment, noting the voltage across the one bulb as you remove the others.

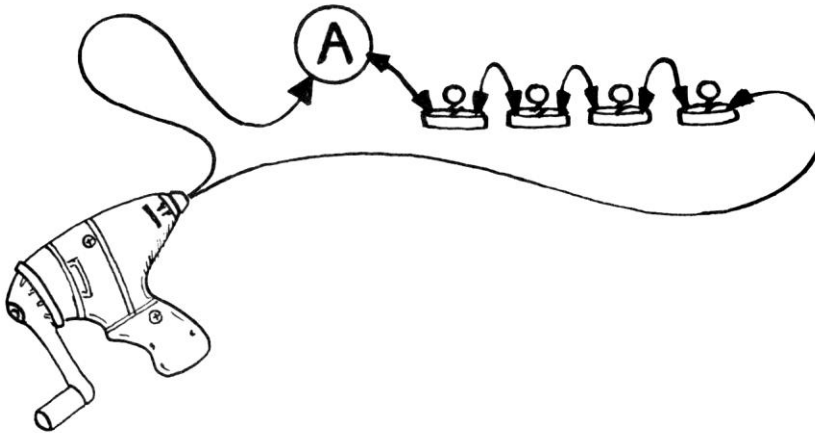


9. What happens to the voltage across one bulb as the number of bulbs in the circuit is decreased? Explain.

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10. Connect an ammeter in series with the bulbs and repeat the experiments.



11. What happens to the current as bulbs are removed? Explain.

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