

# PhyzLab: Be the Battery

an investigation of mechanical and electrical resistance using a generator

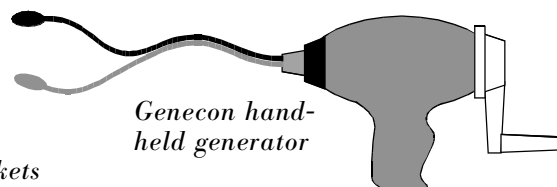
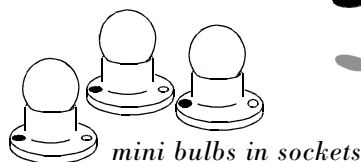
PERIOD	1.		
	2.		
GROUP	3.		
	4.		

## • Purpose •

In this activity, you will investigate the relationship between the electrical resistance of various electric loads and the mechanical resistance experienced while generating power for them.

## • Apparatus •

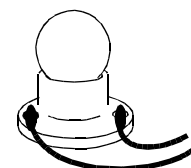
- \_\_\_ Genecon® hand-held generator
- \_\_\_ 3 mini bulbs (6.3V)
- \_\_\_ 3 mini sockets
- \_\_\_ 4 connecting wires



## • Procedure •

### 1. NORMAL CIRCUIT

With the light bulb screwed in firmly, rotate the handle to generate enough electric power to light the bulb. **Crank the handle of the Genecon smoothly at a speed no faster than 3 revolutions per second. Never give the handle a sudden jerk or burst of motion.**



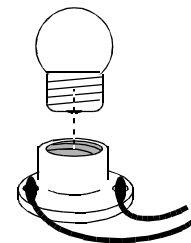
Normal Circuit

### 2. OPEN CIRCUIT

a. Evaluation. What—if anything—would happen to the **electrical** resistance of this circuit if the bulb were removed? (This condition is known as an open circuit.)

b. Prediction. What—if anything—would happen to cranking effort (**mechanical** resistance) if the bulb were removed from the socket?

c. Observation. Remove the bulb from the circuit. What happens to the **mechanical** resistance (how does it compare to the normal circuit)? Each member **does** this.



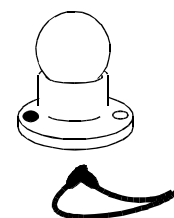
Open Circuit

### 3. SHORT CIRCUIT

a. Evaluation. What—if anything—would happen to the **electrical** resistance of this circuit if it were shorted out?

b. Prediction. What—if anything—would happen to the **mechanical** resistance if the circuit were shorted out?

c. Observation. Connect the leads of the Genecon to each other. What happens to the **mechanical** resistance (how does it compare to the normal circuit)?



Short Circuit

4. a. How does the **mechanical** resistance in the Genecon relate to the **electrical** resistance in the circuit it's attached to?

b. As the electrical resistance of a circuit increases, the mechanical resistance it offers to the

Genecon \_\_\_\_\_.

#### 5. SERIES/PARALLEL RESISTANCE

Which has more **electrical** resistance: three resistors (or bulbs) in series or three resistors (or bulbs) in parallel?

a. What procedure can you use to determine an answer to this question? Describe your procedure using words and diagrams or pictures. (The schematic symbol for a Genecon is the same as for a battery.)

b. What did you discover as a result of carrying out your procedure?