

Name _____

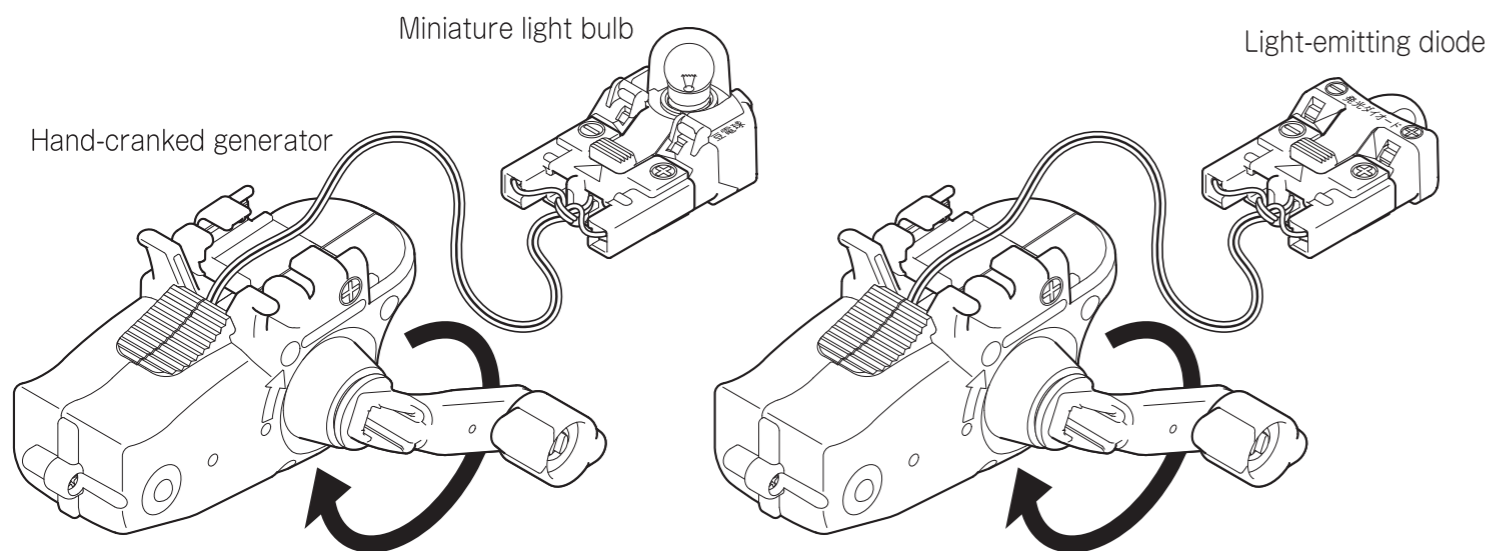
Let's make electricity.

1 Generating electricity with a hand-cranked generator

Power generation experiment

- 1 Attach a miniature bulb to the hand-cranked generator and slowly turn the handle.
- 2 Turn the handle quickly and examine if there is a difference in the brightness of the miniature light bulb.
- 3 Find out what happens to the miniature light bulb when you turn the handle in the opposite direction.

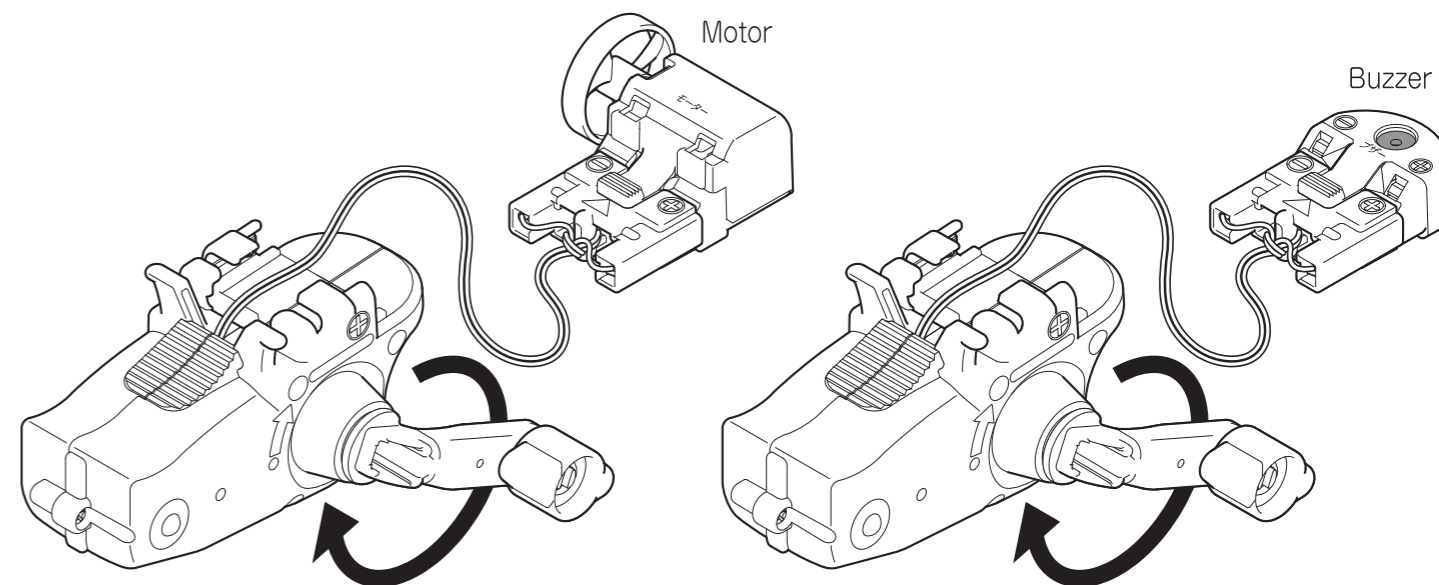
- 4 Replace the light bulb with a light-emitting diode and try turning the handle in the same way. Compare the difference as compared to turning the handle when the light bulb is attached (if it is difficult to see the difference, switch the diode and light bulb several times). If you turn the handle quickly, examine if there is a difference in the brightness of the light-emitting diode.
- 5 Find out if the light-emitting diode shines differently when the handle is turned quickly.
- 6 Find out what happens to the light-emitting diode when the handle is turned in the opposite direction.



☆ The results of the experiment are summarized in the table below.

	Miniature light bulb	Light emitting diodes
Response to turning		
When turning slowly		
When turning quickly		
When turning in the opposite direction		

- 7 Switch to a motor and try turning the handle in the same way. Compare the difference as compared to turning the handle when the light bulb is attached.
- 8 Turn the handle quickly to find out if there is a difference in rotation.
- 9 Turn the handle backward to find out if there is a difference in rotation.
- 10 Replace it with a buzzer and turn the handle in the same way.
- 11 Turn the handle quickly and see if there is a difference in sound.
- 12 Find out what happens to the buzzer when you turn the handle backward.



☆ Let's summarize the result of experiment below.

	Motor	Buzzer
Response to turning		
When turning slowly		
When turning fast		
When turned in the opposite direction		

☆ Write down what you have learnt about electricity generation in the brackets ().

- If you generate electricity slowly, you generate () electricity, and if you generate electricity quickly, you generate () electricity.
- If we generate electricity in the opposite direction, the flow of electricity will be like ().

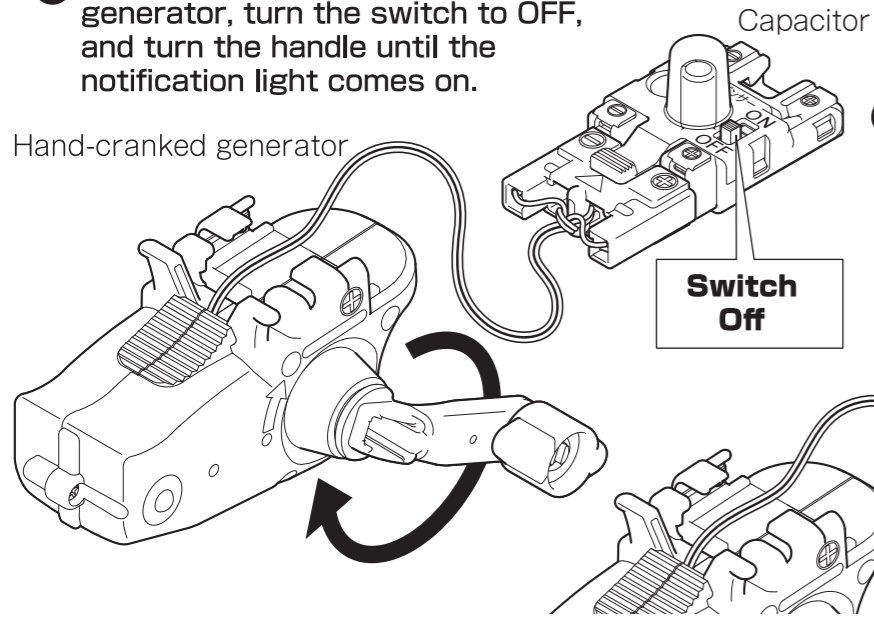
☆ Let's summarize what we have learnt about power generation.

Can we store and use the electricity we have made?

Experiment 2 Use a capacitor to store electricity

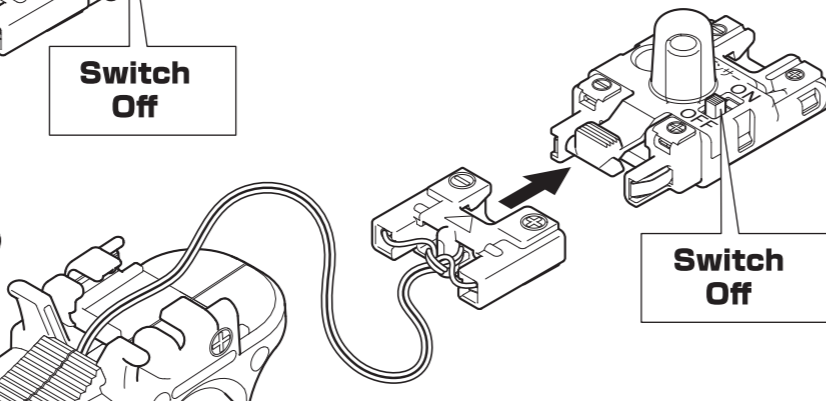
Energy storage experiment Store electricity in the capacitor

1 Attach the capacitor to the hand-cranked generator, turn the switch to OFF, and turn the handle until the notification light comes on.

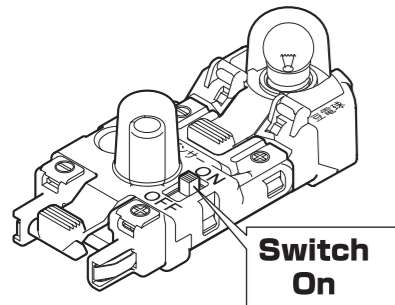


☆Write down how did the handle feel as the electricity built up.

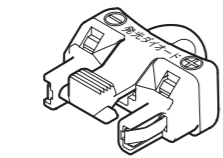
2 When the notification light comes on properly, remove the capacitor from the hand-cranked generator.



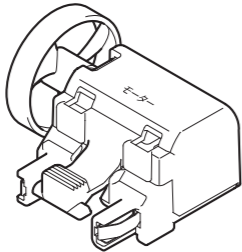
Application of stored electricity 3 Find out what happens when you attach the miniature light bulb to the capacitor, and turn on the switch. In the same way, find out what happens when you attach the light-emitting diode, motor, and buzzer.



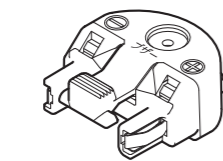
☆What happened to the miniature light bulb?



☆What happened to the light-emitting diode?



☆What happened to the motor?



☆What happened to the buzzer?

☆Write down the changes caused by the electricity in the brackets ().

- When the miniature light bulb/light-emitting diode were attached, the electricity causes ().
- When the motor is attached, the electricity causes ().
- When the buzzer is attached, the electricity causes a ().

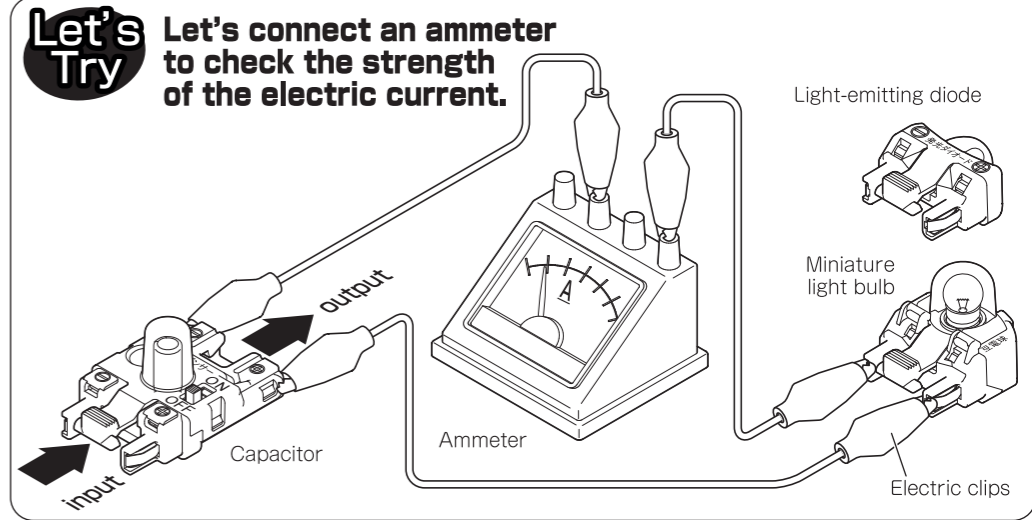
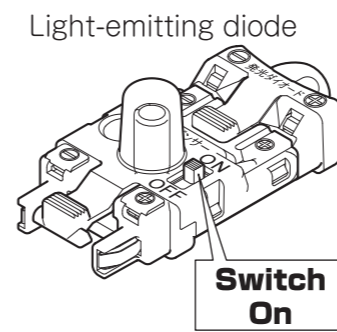
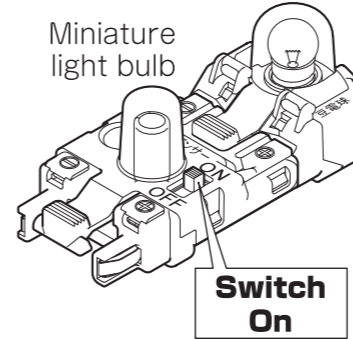
Compare miniature light bulbs and light-emitting diodes

4 Store electricity using method described in 1. Compare the time taken for the miniature light bulb/light-emitting diode to light up.

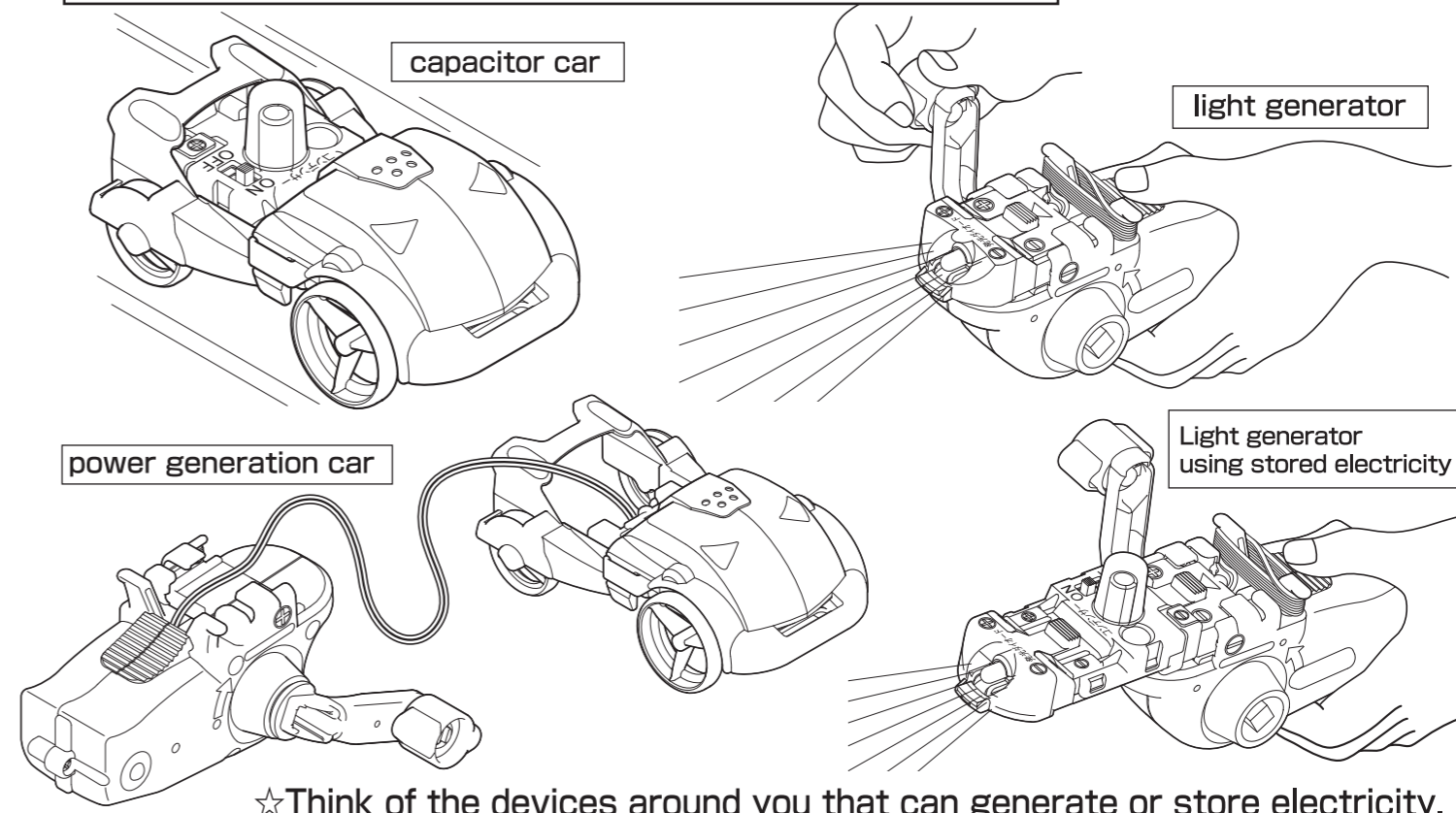
☆Let's summarize the results of the experiment below.

	Time taken to light up
Miniature light bulb	
Light-emitting diode	

Electric current strength
Amps
Amps



Try making devices that make use of electricity!



☆Think of the devices around you that can generate or store electricity.