

## Section 3

### Understanding Matter and Energy

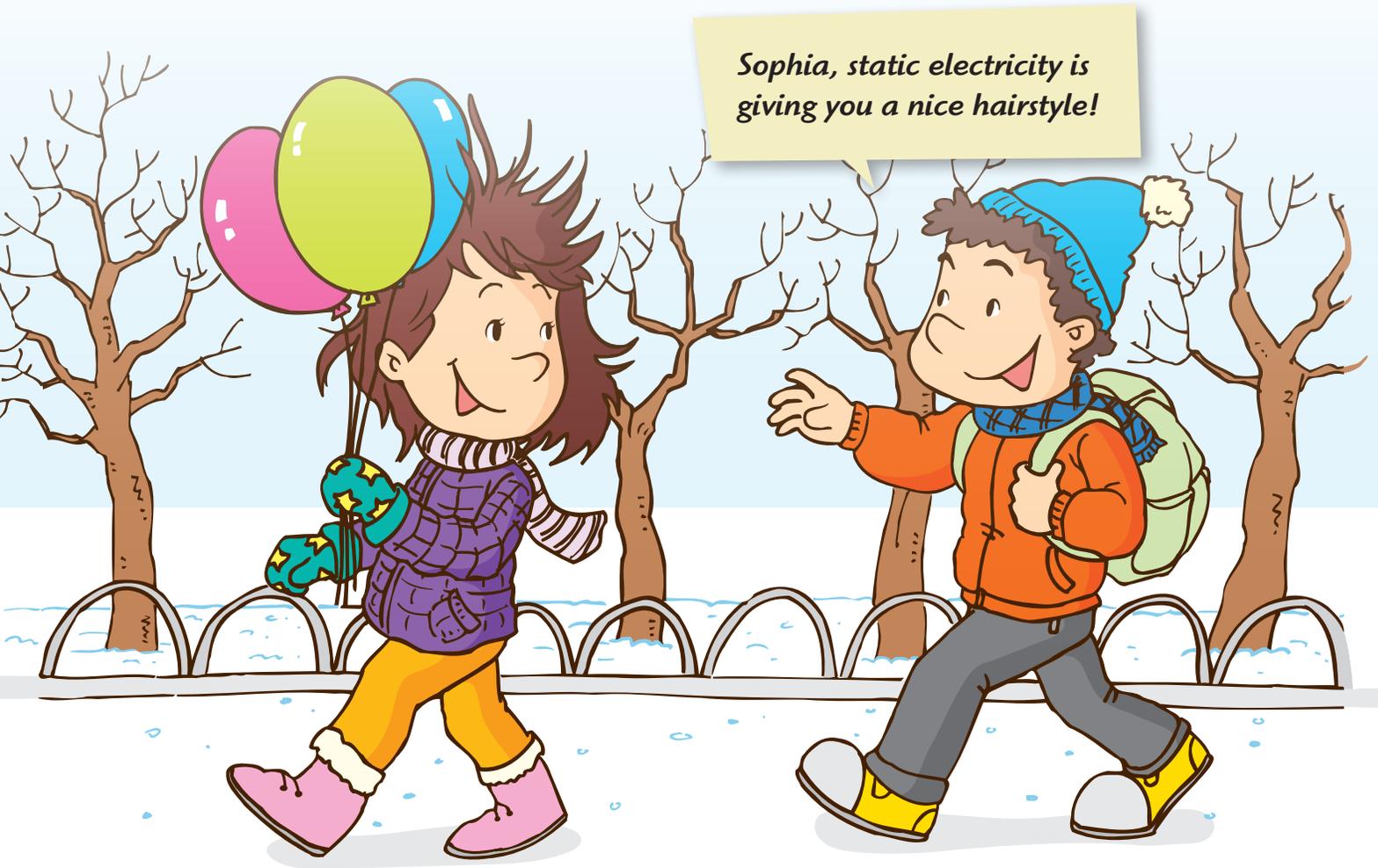
#### EXPLORATION 1

## A Sticky Comb

Investigate what static electricity is and how it works.

Can you bend a stick? You can certainly do so by holding the two ends of the stick and applying a force to bend it. But how about bending a stream of water? Of course it is impossible for us to get a solid grip on running water, but you might be surprised to learn that bending water is about as simple as bending a stick. All you have to do is make use of static electricity – something that you can generate yourself.

*Sophia, static electricity is giving you a nice hairstyle!*



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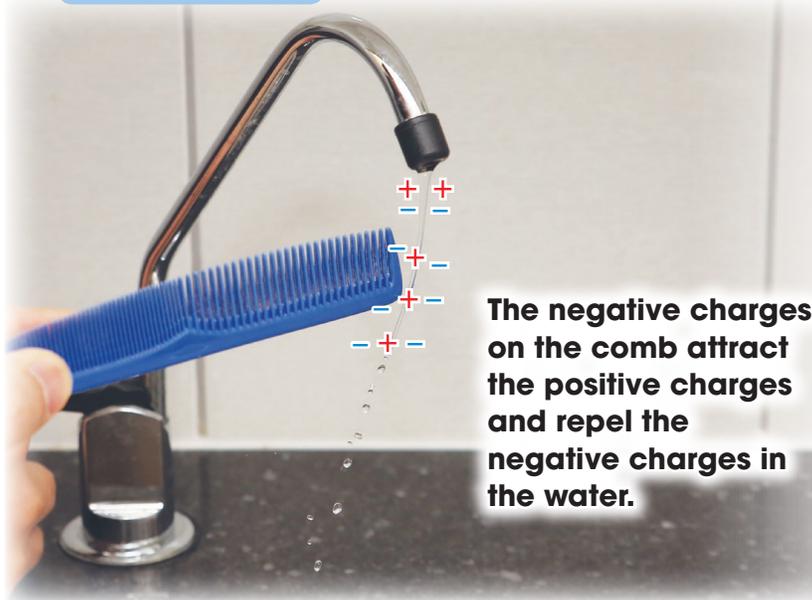
Try this experiment to observe the effects of static electricity.



*For this experiment, all you need is a comb. To get the best result, comb your hair on a dry winter day while wearing a woollen sweater and standing on a carpet.*

Turn on the faucet to make a slow running stream of water. Run the comb through your hair about ten times. Move the comb toward the stream of water slowly. Make sure that the comb does not touch the water. Observe. Then make the comb wet and move it toward the stream of water again. Observe.

### Result:



**The negative charges on the comb attract the positive charges and repel the negative charges in the water.**

Were you surprised to see the stream of water bend toward the comb? This happened because of static electricity. When you were combing your hair, negative charges moved from your hair onto the comb. And when you moved the comb close to the stream of water, the negative charges on the comb attracted the positive

charges in the water, causing the water to bend toward the comb. However, after the comb had touched the water, the negative charges on the comb transferred to the water and the effect was lost.

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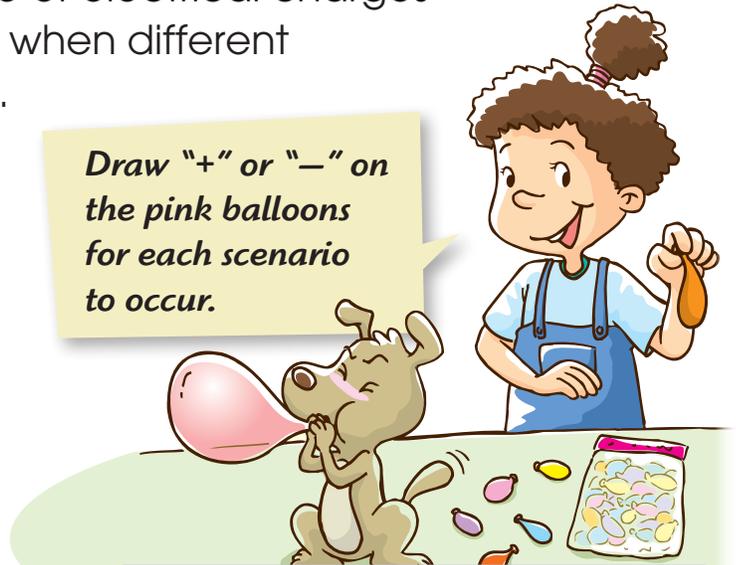
**Read about static electricity and do what the girl says.**

Static electricity is the buildup of electrical charges on an object. This can occur when different materials come into contact.

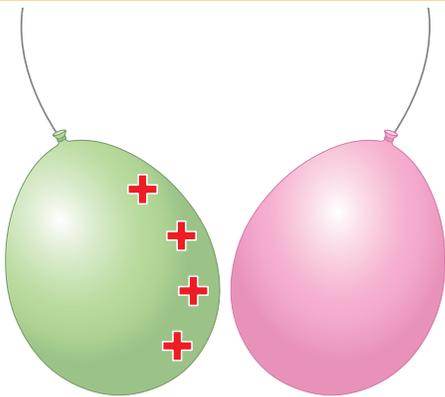
Here are some properties of electrical charges:

- Opposite charges attract.
- Like charges repel.

*Draw "+" or "-" on the pink balloons for each scenario to occur.*



**Opposite charges attract.**



**Like charges repel.**

