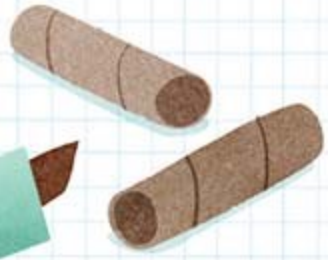
Let's show that light waves travel in straight lines.

What you will need:

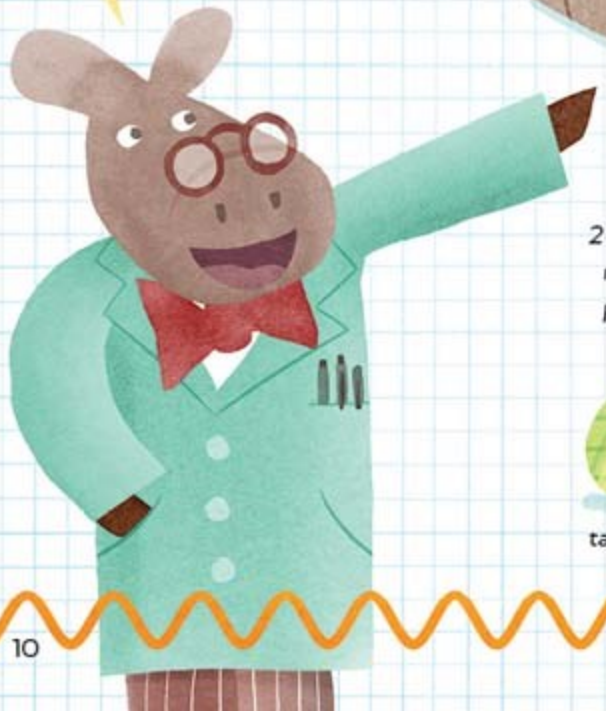
flashlight

book



2 cardboard tubes from rolls of toilet paper or paper towels

tape



1. Stand the book up on a desk or table with the front facing you.

2. Hold the flashlight close to the book, and turn it on. The front of the book is bathed in light. The back is not. That's because light waves travel in straight lines. They travel straight at the book. They do not go around it.

3. Next, tape the two cardboard tubes together. You now have one long tube.

4. Take the tubes and flashlight to someplace dark. Shine the flashlight through one end of the tube. The light should shine through the tube and out the other end.

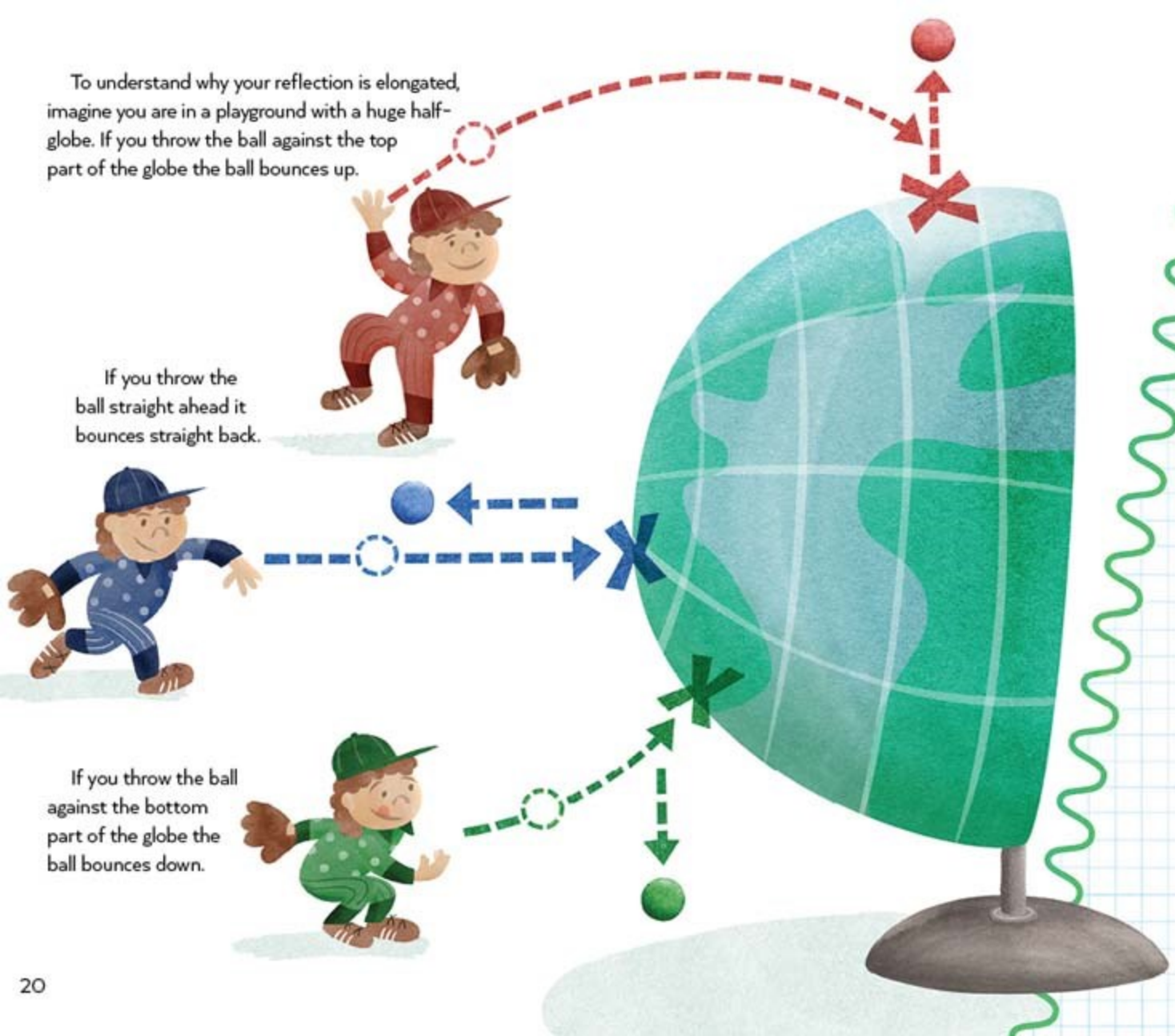
5. Now, where the two tubes are taped, bend them so they no longer form one straight tube.

6. Shine the flashlight through one end of the tube. The light waves will not shine through the other end because light waves only travel in straight lines.

To understand why your reflection is elongated, imagine you are in a playground with a huge half-globe. If you throw the ball against the top part of the globe the ball bounces up.

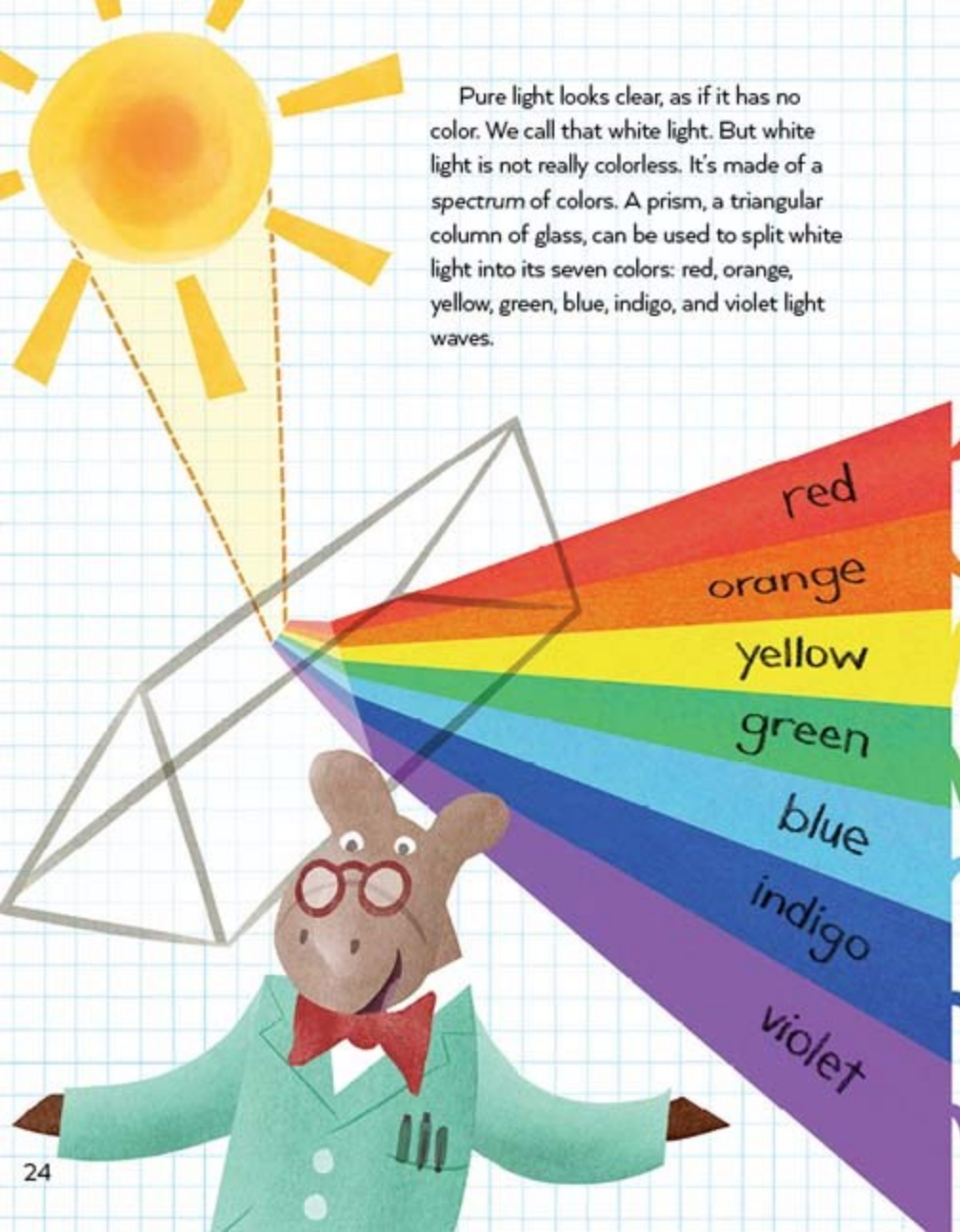
If you throw the ball straight ahead it bounces straight back.

If you throw the ball against the bottom part of the globe the ball bounces down.



That's what happens when you look at the back of the spoon. The light waves do not all bounce straight back. Light waves bounce up off the top of the spoon and down off the bottom.

Pure light looks clear, as if it has no color. We call that white light. But white light is not really colorless. It's made of a *spectrum* of colors. A prism, a triangular column of glass, can be used to split white light into its seven colors: red, orange, yellow, green, blue, indigo, and violet light waves.



Think again of light waves as wavy bands made up of tiny bits of light. These bands of light have crests (high points) and valleys (low points).

What makes the colors of the light waves different is the distance each color has between its crests. With the red waves the distance between the crests is greatest.

The distance is smallest with the violet waves.