Revisiting Water in a Straw

(Reinforcement Activity)

Present the following question for your students to consider: "You are able to keep the water in a straw by placing your finger over the top of the straw and taking it out of the cup. Thinking about this in terms of air pressure, can you explain this phenomenon?" Have students draw a model.

By closing off the top end of the straw with our forefinger, we prevent more air from coming in. Some water will drip out of the lower end of the straw, enlarging the volume of the air pocket above the water and thus creating a lower air pressure inside the straw. This is essentially an example of Boyle's law. If you increase the volume of the enclosed air, the air pressure decreases. The outside air pressure remains the same. This difference in air pressure means that a greater number of the molecules that make up the air are bouncing off the water at the bottom of the straw than at the top, so the water remains in the straw. When the finger is released, there is no longer a difference between the air pressure of the inside and outside of the straw, thus the fluid flows out of the straw.

Model: