Six to One

"Slowly to the right... Jump to the left... To the right again, just a little... Down quickly." Water droplets appear to follow a choreographer's directions when flowing down a window. These directions seem to be laid out in a pattern of droplets. When a droplet encounters another droplet, they join. Quickly the two fall and encounter other droplets. Eventually, they drip out of sight!

Materials
A sharp pencil  A ruler  Adhesive tape
Water  A sink
A milk container or large drink box

To Do
Use a ruler to draw a horizontal line across the bottom edge of a milk container's side. The line should be drawn about 2 inches (5 cm) above the container's bottom. Make six marks along the line, each about 1/2 inch (1.3 cm) apart. Use the pencil to punch out a hole at each one of the marks. Place a strip of tape across the holes. Fill the container with water. While holding the container over a sink, remove the tape. Observe the six separate water streams.

Use your fingers to slowly pinch the streams together. What happens to the streams as they are being pinched?

How long will they remain together? How can you make them flow separately again?

The Science
As you probably guessed, the streams' behavior is due to the attraction between water molecules. At first, the individual water streams are too far apart to affect each other's path. However, when they are pinched, the streams are brought together. Their force of attraction is strong enough to prevent the streams from separating. However, if a hand physically separates them, they will go back to flowing as six individual streams.

Check It Out! Repeat this experiment with six holes placed vertically instead of horizontally