



These 4 experiments demonstrate Bernoulli's Principle: as airspeed increases, air pressure decreases. This is what makes heavier-than-air flight possible.

### SUPPLIES

- 2 balloons
- 2 strings (~3 ft each)
- Tape
- Hair dryer
- Ping-pong balls (3+)
- Small kitchen funnels
- Bendy straws
- Tube: 1.75"–2" inner diameter
- (acrylic tube 9"–12" ideal)

### EXPERIMENT 1

## TWO BALLOONS

- 1 Inflate both balloons and tie a string to the end of each.
- 2 Tape the strings to a door frame so both balloons hang at the same height, about 2 inches apart.
- 3 Take a straw and blow air between the two balloons. Observe what happens.
- 4 Now blow air outside one balloon (not between them). Observe what happens.

### TEACHER EXPLANATION

Blowing between the balloons increases air speed in that gap, which lowers the pressure there. The higher-pressure air on the outside pushes both balloons inward — toward the straw. Blowing outside one balloon creates the low-pressure zone on the outside, pushing that balloon away. This is Bernoulli's Principle in action.





## EXPERIMENT 2

## FLOATING BALL

- 1 Point the hair dryer straight up and turn it on.
- 2 Place a ping-pong ball in the upward airflow.
- 3 Gently push the ball sideways with your finger. Watch it return to center.
- 4 Slowly tilt the hair dryer about 30 degrees to the side. The ball stays in the airflow and doesn't fall.

## TEACHER EXPLANATION

The moving air creates a column of low pressure. When the ball drifts to the side, it enters the higher-pressure still air — which pushes it back into the low-pressure zone. Even when tilted, the ball chases the low-pressure column. It's not being 'held' — it's being pushed.

## EXPERIMENT 3

## BALL UP THE TUBE

- 1 Set the tube at a gentle angle by propping one end on a book or two.
- 2 Place a ping-pong ball at the lower (entrance) end of the tube.
- 3 Position the hair dryer at the high end of the tube, blowing across the opening.
- 4 Turn on the hair dryer. The ball should be drawn up the tube.
- 5 If the ball gets stuck, gently squeeze the tube to make it round and release it.

## TEACHER EXPLANATION

The hair dryer blows across the top opening of the tube, creating a low-pressure zone there. This pulls air up through the tube — and the air movement drags the ping-pong ball along with it. Lower pressure at the top, higher pressure at the bottom: the ball moves toward low pressure.





## EXPERIMENT 4

## FUNNEL TRAP

- 1 Bend the bendy straw at a right angle.
- 2 Connect the short end of the straw to the funnel opening.
- 3 Place the ping-pong ball in the funnel.
- 4 Have a student blow through the long end of the straw. Try to pop the ball out.

## TEACHER EXPLANATION

Blowing through the straw sends air moving across the sides of the funnel. Moving air = lower pressure along the funnel walls. The higher-pressure air above pushes the ball down into the funnel — so blowing actually traps it in place.

## BONUS EXPERIMENT

Flip the funnel upside down and hold the ping-pong ball in with your finger. Blow through the straw and release your finger. The ball should remain stuck in the funnel — now the moving air creates low pressure below, and atmosphere pushes the ball up.

## BERNOULLI'S PRINCIPLE

As airspeed increases, air pressure decreases. The foundation of all flight.

## LOW PRESSURE = LIFT

Faster air above a wing creates lower pressure. Higher pressure below pushes up.

## WHY PLANES FLY

Wing shape forces air to move faster over the top — creating lift from pressure difference.

**IT LOOKS LIKE MAGIC. IT'S JUST SCIENCE.**

Use these experiments to spark curiosity — then let the real explanation land.