

## What Helps an Airplane Fly?

Lift is the force that opposes gravity, pushing or lifting an object upward and away from the Earth's surface. Believe it or not, moving air is the key to lift! Air is made of tiny particles that push down on everything. Fast-moving air doesn't push as hard as air moving more slowly.

### Objective

Demonstrate the effect of moving air and how it creates lift.

### Materials

- a portable hair dryer
- a sheet of paper
- tape
- a ping-pong ball

**Safety Notice:** All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

### Procedure

1. Lay a sheet of paper on a tabletop, letting about half of the sheet hang over the edge.
2. Tape the other end to the table.
3. Now take your hair dryer and point it sideways away from the table, over the hanging piece of paper. What do you think will happen to the paper when you turn on the hair dryer and blow air over the top of the paper?

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4. Turn the blower on low, and watch what happens to the paper. Now try the blower on high. What happens?

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- Think of the paper as an airplane wing. Describe what would happen to the wing if the air above it was moving faster than the air below it.

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5. Point the blow-dryer straight up in the air, and turn it on high at a cool setting. What do you think will happen to a ping-pong ball placed in the stream of air?

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6. Hold the dryer steady and place the ball into the stream of air. What happens?

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7. Slowly turn the direction of the air stream so that it is not pointing directly upward. What happens to the ball?

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### Conclusions

- Why do objects move toward faster moving air?

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- Draw a diagram of the air flowing past the paper. Use long arrows to show fast moving air, and shorter arrows above and below to show lift.

- Draw a diagram of the air stream around the ping-pong ball, using long arrows for the stream of fast moving air around the ball, and smaller arrows pointing inward toward the ball to show high pressure keeping the ping-pong ball from dropping.