Hawks and Other Soaring Birds

Lift your Wings and Fly

What you need!

- A hair dryer
- A ping-pong ball
- A stand for the hair dryer (or have a friend hold it)

Birds and flying insects use their wings to stay airborne, but all the flapping in the world won't help them take off. Birds fly with the help of lift. Lift is a force that helps planes, birds and bees to fly. It can also be used to make other things fly too.

What you do:

1. Place the hair dryer in the stand so that it points straight up
2. Turn on the hair dryer.
3. Balance the ping-pong ball in the blowing air.
4. Try placing the ball at the edge of the blowing air.
5. Try tilting the hair dryer and placing the ball in the blowing air.
6. Move the hair dryer and ball and blow air towards a wall or a corner of a room.

Ask yourself

- How does the ping-pong ball stay in the air?
- Does the ball fall when you pull it partly out of the blowing air?
- What happens when you tilt the hair dryer?
- What happens when you blow the air towards a wall or corner?
- Explain what you think is happening to the ping-pong ball in each test.

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What did you find out?

The ping-pong ball stays in the air because of areas of high and low pressure that act upon it. The air that rises from the hair dryer hits the bottom of the ball and creates high pressure. This high pressure holds the ball up, against the downward pull of gravity.

When the ball is pulled halfway out of the airflow, it gets sucked back in when released. The fast flowing air moving along the inside arc of the ball creates low pressure on that side. The ball is pushed back into the airflow because the normal air-pressure on the other sides of the ball is higher, and pushes it towards the low-pressure area.

Bird wings work in much the same way as this experiment. Winds that rush over and under their wings create regions of low and high pressure. Bird wings are shaped like an arc. The air that flows over the top of the wing goes over faster creating low pressure, while the slow air passing below the wing creates high pressure. This combination, known as the *Bernoulli Principle*, creates lift and allows birds to fly.

Specific Learner Expectations (SLE)

Grade 6 Topic A: Air and Aerodynamics.

SLE 3: Describe and demonstrate instances in which air movement across a surface results in lift – Bernoulli's Principle.

SLE 4: Recognize that for living things to fly they must have significant lift to overcome the forces of gravity.

SLE 5: Identify adaptations that enable birds and insects to fly.

SLE 6: Describe the means of propulsion for flying animals and for aircraft.