

Spiral Elevator

Hawks, Cranes, and Other Soaring Birds

What you need!

- Scissors
- Tissue paper
- Thread (15 cm long)
- Tape
- Desk lamp
(make sure the bulb is not an energy efficient bulb-it has to get hot)

Air is dynamic; its temperature is continually changing and this affects wind direction. Birds take advantage of winds as well as slight differences in air temperatures. Small differences in the temperature of air from one place to the next create air-elevators that birds can ride to reach great heights.

What you do:

1. Cut a piece of tissue paper into a 6cm (about 2") diameter circle.
2. Cut the circle into a spiral.
3. Cut a 15 cm (6") piece of thread and tape one end of the piece of thread to the center of the paper spiral.
4. Place a desk lamp so that the light points straight up.
5. Hold the paper spiral by the thread about 10 cm (4") above the light. (Caution: Do not allow the paper to touch the light bulb.)

Ask yourself

- What do you see happen to the paper?
- Why do you think this happens?
- What is the heat from the lamp doing to the air?
- How can animals take advantage of this when it happens in nature?
- Why would this be an advantage?
- Can you name an animal that takes advantage of this phenomenon?

What did you find out?

The energy produced by the light heats the air that surrounds the bulb. When molecules are heated they move further apart, so the warm air become less dense and lighter. The warm air rises and is replaced by cooler heavier air, creating a circular movement of air called a "convection current".



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What did you find out? (cont.)

This type of air current is always going on all over the planet. As the sun warms the ground, small temperature differences are created. The warm air rises and cooler air falls. Rising air produces thermals or 'air elevators' that birds seek out to soar to great heights. This helps birds, because from up high, they can glide greater distances and reduce the amount of energy they would use when flapping. Many large birds, like hawks, eagles, and cranes are master soarers; their broad wings and tails are designed to take full advantage of thermals.

Specific Learner Expectations (SLE)

Grade 6 Topic A: Air and Aerodynamics.

SLE 2: Provide evidence that air is fluid and can be compressed and identify examples of these properties in everyday life.

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