Helicopters: How Do They Work?

Grade Level: 4-6
Classroom Time: 45-60 minutes

Materials:
- Helicopter Pattern
- Paper Clip
- Scissors
- Aerodynamics Handout

Objectives:
1. Follow instructions, step by step, to achieve the desired outcome.
2. Name 3 instruments that control the flight of helicopters.
3. Explain why a helicopter does not just spin like the blades do in the air.

Teacher’s introduction to the activity:
Aerodynamics is the way objects move through air. The rules of aerodynamics explain how aircraft are able to fly. The four forces of flight are lift, weight, thrust and drag. These forces make an object move up and down, and faster or slower. The amount of each force compared to its opposing force determines how an object moves through the air.

Instructions:
1. Cut along the solid (not dotted) lines of the pattern.
2. Fold the 2 helicopter blades in opposite directions along the dotted line.
3. Fold the sides of the helicopter toward the middle along the dotted lines.
4. Fold the bottom part of the helicopter up along the dotted lines.
5. Attach a paper clip to the very bottom of the helicopter.
6. Toss the helicopter straight up into the air to see it whirl as it descends.
7. Redesign with different kinds of paper or a different size. Compare and contrast the different designs.

Skills: Follow sequential directions.

Vocabulary: Aerodynamics, Drag, Lift, Thrust
Paper Helicopter Plans

1. Cut on solid black lines. Fold on dashed lines.

2. Fold A and B to middle.

3. Fold C up.

4. Fold propeller blades outward.

5. Test fly by dropping from over your head.
**Helicopters: How Do They Work?**

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The rotating wings of a helicopter are shaped just like the airfoils of an airplane wing, but generally the wings on a helicopter's rotor are narrow and thin because they must spin so quickly. Unlike an airplane, a helicopter does not have to move quickly through the air to have lift. A helicopter can:

- move straight up or down,
- take off or land without a runway,
- turn in the air in ways airplanes cannot,
- fly backwards or sideways,
- and hover in one spot.