Flight

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Bag Balloons

Objectives

The students will:
Demonstrate that heat can change air.
Determine that hot air rises.
Construct a working model of a hot air balloon.

Standards and Skills

Science
Science as Inquiry
Science and Technology

Mathematics
Estimation

Science Process Skills
Communicating
Observing

Background

Hot air balloons are one type of aircraft. (The four categories of aircraft are airplanes, gliders, rotorcraft, and hot air balloons.) In this activity, students construct a working model of a hot air balloon.

There are two ways a balloon can rise: it can (1) be filled with a gas that is lighter than air, such as helium, or (2) it can be inflated with air that is heated sufficiently to make it "lighter" than the air outside of the balloon.

Helium is the second-lightest element, and the main sources for helium are natural gas fields (especially those in the states of Texas, Oklahoma, and Kansas). Heating air makes it less dense, rendering it essentially "lighter." Gas balloons and hot air balloons float because they are lighter than the air they displace.
Materials

- Plastic bag ("dry cleaners" bag or 5-gallon trash bag)
- Paper clips (used for weight)
- Small pieces of paper or stickers (decorations)
- String
- One hair dryer per classroom (heat source)
- Party balloons

Preparation

Show students pictures of hot air balloons. Ask the students to share their ideas about how the balloons rise. Also ask students to share what they know about hot air balloons, or what they think about the uses of hot air balloons.

Show the students a helium balloon. Ask the students to share what they think makes the helium balloon rise when you let go of the string.

Activity

1. Divide the class into groups of four, and provide each team with a set of materials.

2. Have the students decorate their plastic bags. Decorations should be small and light, such as small scraps of paper or stickers.

3. Have the students tie a string around the top of the plastic bag.

4. Add paper clips evenly spaced around the bottom of the plastic bag.

5. Have the students hold the plastic bag over the hair dryer (on the high setting) and let the plastic bag fill with hot air.

6. The plastic bag becomes buoyant as it fills with hot air. When the students feel the bag tugging, have them release it. The hot air inside the balloon is lighter than the air in the classroom and begins to float.
Discussion

1. Have the students identify the different parts of the hot air balloon: plastic bag—hot air balloon; hair dryer—heat source; paper clips—weights for balance and stability.

2. Ask the students to explain why the hot air balloon works. *The hot air balloon rises when the air inside the balloon becomes heated. The heated air is lighter than the classroom air and enables the balloon to float.*

3. Ask the students to tell how hot air balloons are different from balloons filled with helium. *Helium is a gas that is lighter than air, even when it’s not heated. Helium though, just like heated air, floats in the surrounding air because it’s lighter. Helium should not be confused with hydrogen, which is an inflammable gas that was often used in balloons and airships until the explosion of the airship Hindenburg in 1937.*

4. Have the students inflate a party balloon. Ask them to explain why it does not rise. *A person’s breath may be warmer than room temperature, but it is not hot enough to overcome the weight of the balloon.*

Assessment

Using their actual models, have the students explain why their hot air balloons rise.

Extensions

1. Have the students construct another hot air balloon using different sizes and types of plastic bags.

2. Have students experiment with paper clips—different sizes and numbers—to see the effects of weight on their model balloons.

3. Have the students research the part that balloons played in the history of flight.

4. Have the students role play a reporter interviewing one of the Montgolfier brothers. (Refer to background information included in this guide about the Montgolfier brothers.)
Bag Balloons
SLED KITE

Objectives

The students will:
Construct and fly a simple sled kite.
Demonstrate how to make the kite fly at varying heights.

Standards and Skills

Science
Science as Inquiry
Unifying Concepts and Processes

Science Process Skills
Observing
Measuring
Predicting
Controlling Variables

Mathematics
Connections
Estimation
Measurement

Background

The sled kite in this activity is a model of a type of airfoil called a parawing. Like any wing, the parawing depends on the movement of air over its shape to generate a lifting force. (Parasails, parafoils, and paragliders are similar lift-generating devices.)

The NASA Paraglider Research Vehicle (Paresev) was the first flight vehicle to use the Francis Regallo-designed parawing. The little glider was built and flown by NASA during the early 1960’s to evaluate the parawing concept, and to determine its suitability to replace the parachute landing system on the Gemini spacecraft. Although the parawing was never used on a spacecraft, it revolutionized the sport of hang gliding. Hang gliders use a parawing to glide from cliffs or mountain tops.
There are kites of all shapes, sizes, and colors. The sled kite in this activity is made from a piece of cloth or paper and two drinking straws. The straws are attached parallel to each other on opposite sides of the cloth or paper. This arrangement shapes the kite like a sled when it catches the air. The string attachment points are placed toward one end of the kite, which causes the opposite end to hang downward, and stabilizes the kite in flight.

### Materials (per kite)

- Sled Kite Template
- Two drinking straws
- Cellophane tape
- Scissors
- Two 45 cm lengths of string
- One 1 m length of string
- Metric ruler
- Single-hole paper puncher
- One paper clip
- Markers, crayons, pencils
- Selection of paper (crepe, tissue, newspaper)

### Management

Approximately 30 minutes are needed to build the sled kite. Additional time is needed to allow the students to fly and evaluate their sled kites outside.
Activity

1. Make a copy of the Sled Kite Template. Carefully cut out the sled kite.

2. Decorate the top of the sled kite using crayons, markers, or other media.

3. Trim the length of the two drinking straws so they will fit in the area marked for the straws. Tape them in place.

4. Place two or three pieces of tape in the marked areas covering the black circles.

5. Using a single-hole paper puncher, carefully punch the two holes marked by the black circles.

6. Cut two pieces of kite string 45 cm each. Tie a string through each hole. Tie them tight enough so you do not tear the paper.

7. Tie the opposite end of both strings to a paper clip.

8. Pick up the 1 m long piece of string. Tie one end of this string to the other end of the paper clip. Your sled kite is ready to fly!

9. Outside in a clear area, hold the 1 m length of string and run with the kite to make it fly.

10. Run slow and run fast, and observe how the kite flies at different towing speeds.
Discussion

1. Can kites be used to lift objects? Yes, a popular beach activity uses a large kite (parasail) towed by a speed boat to lift a person high into the air.

2. Why are kites made of lightweight material? Lightweight materials insure the kite will weigh less than the "lift" produced by the kite.

Assessment

1. Have students explain how their kite was built.

2. Have students demonstrate ways to make the kite fly higher, and to fly lower.

Extensions

1. Have the students decorate their kite using a minimum of three colors.

2. Record the length of time for each flight.

3. Have the students run a relay with a kite as a means to sustain its flight.

4. Design a kite and write the directions on how to build it.

5. Add a tail to the sled kite using crepe paper, strips of newspaper, tissue paper, or garbage bags. Have students predict what, if any, changes will occur in the kite's flight characteristics. Conduct flights to test the predictions.

6. Research the history of kites.
Sled Kite Template

tape straw here

tape straw here

tape

tape
Sled Kite
Sled Kite
Sled Kite

Sled kite flying journal

Date __________________________  Student name __________________________

Weather __________________________

Sled Kite Flight
What happened when I...
1. When I walked with my sled kite, my sled kite:
______________________________________________________________________

2. When I ran with my sled kite, my sled kite:
______________________________________________________________________

Sled Kite Tail, What if...
What if I add a tail to my sled kite? I think a tail will make my sled kite fly like this:
______________________________________________________________________

After I added a tail to my sled kite, it flew like this:
______________________________________________________________________

What if I shorten the tail, I think it will make my sled kite fly like this:
______________________________________________________________________

What if I lengthen the tail, I think it will make my sled kite fly like this:
______________________________________________________________________

Conclusions
If the tail is shortened, then the sled kite will fly like this:
______________________________________________________________________

If the tail is lengthened, then the sled kite will fly like this:
______________________________________________________________________
RIGHT FLIGHT

Objectives

The students will:
Construct a flying model glider.
Determine weight and balance of a glider.

Standards and Skills

Science
Science as Inquiry
Physical Science
Science and Technology
Unifying Concepts and Processes

Science Process Skills
Observing
Measuring
Collecting Data
Inferring
Predicting
Making Models
Controlling Variables

Mathematics
Problem Solving
Reasoning
Prediction
Measurement

Background

On December 17, 1903, two brothers, Wilbur and Orville Wright, became the first humans to fly a controllable, powered airplane. To unravel the mysteries of flight, the Wright brothers built and experimented extensively with model gliders. Gliders are airplanes without motors or a power source.
Building and flying model gliders helped the Wright brothers learn and understand the importance of weight and balance in airplanes. If the weight of the airplane is not positioned properly, the airplane will not fly. For example, too much weight in the front (nose) will cause the airplane to dive toward the ground. The precise balance of a model glider can be determined by varying the location of small weights.

Wilbur and Orville also learned that the design of an airplane was very important. Experimenting with models of different designs showed that airplanes fly best when the wings, fuselage, and tail are designed and balanced to interact with each other.

The Wright Flyer was the first airplane to complete a controlled takeoff and landing. To manage flight direction, airplanes use control surfaces. Elevators are control surfaces that make the nose of the airplane pitch up and down. A rudder is used to move the nose left and right. The Wright Flyer used a technique called wing warping to begin a turn. On modern airplanes, ailerons are used to roll the airplane into a turn.

At NASA, model airplanes are used to develop new concepts, create new designs, and test ideas in aviation. Some models fly in the air using remote control, while others are tested in wind tunnels. Information learned from models is an important part of NASA’s aeronautical research programs. The goals of NASA research are to make airplanes fly safer, perform better, and become more efficient.

This activity is designed to help students learn about basic aircraft design and to explore the effects of weight and balance on the flight characteristics of a model glider. Students use science process skills to construct and fly the Styrofoam glider.

Management
This activity will take about one hour.
Materials

Styrofoam food tray, size 12
Glider template
Plastic knife
Toothpicks
Sand paper or emery board
Binder clips
Paper clip
Markers
Goggles (eye protection)

Part 1
Building the Glider

Preparation

1. Ask students to name some materials that might be used to build a model glider. Responses might include balsa wood, paper, cardboard, plastic, and Styrofoam.

2. Gently toss a Styrofoam tray into the air and ask the students to describe how the tray "flew." The tray does not fly because it is not designed to fly. Instead of flying (gliding) it drops.

3. Explain to students that Styrofoam is lightweight and strong which makes it an ideal material to construct model gliders. Styrofoam trays can be obtained from the meat department of a grocery store.

Activity

1. Hand out the materials (Student Page 1, tray, template, cutting and marking devices). Follow the steps listed on the Student Page.

2. Explain that the template is a guide to cut the wings, fuselage, and elevator from the Styrofoam. Cutting can be done in a variety of ways depending on grade level.

For younger students, the teacher or older students can cut out the parts beforehand and have the students assemble the glider. For older students, the teacher can demonstrate cutting out the parts using a serrated plastic knife.

Another way to cut out the parts is by punching a series of holes approximately 2 mm apart around the outside edge of each piece and then pushing the piece out. A sharp pencil or round toothpicks can be used to punch the holes.
3. Use sandpaper or an emery board to sand the edges smooth.

4. Have students assemble the glider by inserting the wings and elevator into the fuselage slots.

Extension

1. Students may apply personal and finishing touches to the model by drawing the canopy outline and adding color, name, aircraft number, squadron logo, icons, or emblems.

2. Ask students to label the parts of an airplane on the model glider.

3. Civilian aircraft have a letter or letters preceding the aircraft’s identification number indicating in which country the aircraft is registered. Mexico uses the letter “X,” Canada uses the letters “CF.” Aircraft registered with the Federal Aviation Administration in the United States are assigned identification numbers that begin with the letter “N.” The airplane’s identification number is called an N-number. Students may apply N-numbers to their model, or “register” their model with other countries.
Caution students not to throw gliders toward other students. The teacher may want to provide eye protection for each student.

1. The model glider’s weight must be balanced or distributed properly before it will fly. To demonstrate this, ask a student to launch a glider before adding weight and balance. Have students describe the flight characteristics.

2. Add weight to the model using paper clips, binder clips, or a penny. Attach the paper clip or penny to the nose of the glider. If a binder clip is used, attach it to the bottom of the fuselage. Ask the students to test fly the glider and observe the flight characteristics.

3. Move the weight (clips) forward or backward on the fuselage to determine the best weight and balance for the glider. The best weight and balance combination can be defined as one that allows the glider to fly the greatest distance.

Discussion

1. Is weight and balance important on “real” airplanes? Yes, all airplanes are required to have correct weight and balance. The pilot is responsible for making sure the total weight of the cargo and passengers is within certain limits and is distributed to keep the plane properly balanced. Flights should not be attempted if the aircraft is overloaded, or if the cargo distribution makes the plane too “nose heavy” or “tail heavy.”

2. Why does the model glider fall erratically during test flights before its proper weight and balance is determined? Lift is a force generated by the wing. This force must be in balance with the weight distribution of the airplane before the model will fly successfully.

Aircraft weight is balanced as a pencil is on your finger.
Assessment

1. Students will successfully meet one objective of the activity by constructing the model glider.

2. Using the model glider, have students explain how they determined the weight and balance for their glider.

Extensions

1. Set up a flight course and have the students demonstrate the flight characteristics of their gliders.

2. Have students cut 2 cm off of each wing tip, and begin a new series of flight tests.

3. Have students design and make new wings for the glider. Experiment with wings of various sizes and shapes.
Right Flight
DELTA WING GLIDER

Objective

The students will:
Learn how to change the flight characteristics of a glider.
Conduct an experiment to answer a question.

Standards and Skills

Science
Science as Inquiry
Physical Science
Science and Technology

Mathematics
Measurement
Problem Solving

Science Process Skills
Making Models
Investigating
Predicting

Background

There are many types of vehicles used to transport people and objects from place to place on Earth. How are these vehicles guided to a destination? Turning the steering wheel changes a car’s direction. The rudder is used to control the direction of a boat. A bicycle is controlled by turning the handle bars and shifting the rider’s weight. For most land and sea vehicles, directional control is accomplished by moving the front end right or left. Movement in this one axis of rotation or direction is called yaw.

Flying an airplane requires control of three axes of rotation or movement. The nose of the plane can be moved right and left (yaw), rotated up and down (pitch) and the fuselage can be rolled left and right (roll). A pilot uses the control wheel or stick inside the airplane to move control surfaces on the wings and tail of the plane. These control surfaces turn the airplane by varying the
forces of lift. Airplanes with conventional wings use ailerons to control roll, a rudder to control yaw, and elevators to control pitch. Airplanes with delta or triangular shape wings have a rudder, but only one control surface (elevon) to control pitch and roll. An elevon serves the same function as an elevator and an aileron.

Elevons are moveable control surfaces located on the trailing edge of the wings. Working in unison (both up or both down) they function as elevators. Working differentially (one up and one down), they function as ailerons. The Space Shuttle uses elevons for control in the air close to the Earth as it descends from space.

Materials

- Styrofoam food tray, about 28 cm X 23 cm (Size 12)
- Cellophane tape
- Paper clip
- Ball point pen
- Plastic knife or scissors
- Toothpicks
- Goggles (eye protection)
- Emery boards or sandpaper

Preparation

1. Show the class a Styrofoam food tray and ask them to identify it. Ask the students to list other uses for Styrofoam. Responses may include cups, fast food containers, egg cartons, packaging material, and insulation.

2. Discuss with the students some reasons for using Styrofoam in the construction of a model glider. Materials for building airplanes must be lightweight, strong, and readily available. These qualities make Styrofoam a good material for the
construction of flying models. Real airplanes are made from another lightweight, strong, and readily available material called aluminum.

3. Styrofoam can be cut using scissors or a serrated plastic knife. Students can also use a sharp pencil or round toothpick to punch a series of holes approximately 2 mm apart around the outside edge of the part. The part can then be pushed out from the tray. Pre-cut the Styrofoam parts for younger students.

4. Provide the student with a word list for parts of the glider. *Fuselage (body of the glider), wing (provides lift), rudder (yaw control), elevons (roll and pitch control).*

Activity

1. A student page contains a template used to cut out the Styrofoam parts of the glider, and instructions for assembling the parts. Educators of K-2 students may want to cut out the gliders ahead of time.

2. Ask the student to write the name of each airplane part on the template.

3. Tape the glider template to the Styrofoam meat tray.

4. Use a sharpened pencil or toothpick to punch holes around the outline of the wing and fuselage. Make sure the hole goes through the Styrofoam.

5. Remove the template and trace around the outline of the wing and fuselage on the tray using a pencil or toothpick. Punch out each part.

6. Smooth the edges of each part using sandpaper or an emery board.

7. Mark both elevon hinges with a pencil. (Note: to make the elevons hinge up and down, use a pen to lightly score the hinge line on the Styrofoam wing. If a break occurs at the hinge line, use clear tape to repair the break.)

8. Carefully cut a slot in the fuselage and slide the wing into it.
9. After constructing the glider, the students determine the "weight and balance" by attaching a paper clip or binder clip to the fuselage. Students should vary the position of the clip with each flight until the glider flies the greatest distance in a straight line.

10. The flight test questions found on the Student Page can be answered by conducting flight experiments. The students change the position of the elevons and draw a diagram to record the flight path of the glider. Test fly the glider and record the results.

Discussion

1. Do all gliders fly alike? No. Small differences in construction can change the flight characteristics of a model glider.

2. Why do we predict what will happen before a test? Predictions help scientists decide what questions the experiment will answer.

Extensions

1. Have students measure and record the distance of the longest flight.

2. Have the students change the size or shape of the wing. Test fly the redesigned glider and record any changes in the flight characteristics.

Assessment

1. Bend the control surfaces on a model glider and ask the students to predict what flight path it will follow. Students can walk the predicted flight path, and launch a glider to test the prediction.

2. Group students together and have them submit a Team Student Record Sheet that summarizes the experimental flight test results.
Delt a Wing Glider
Delt a Wing Glider
Glider Template

wing

fuselage

wing

elevon
**Test Question:** Does changing the position of the elevons on a delta wing glider change its flight path?

**Directions:** Bend the elevons into the positions listed below. Be sure to predict the flight path before flying the glider. Test fly the glider and record the results (up, down, left, right).

**Student Test Pilot Record Sheet** (What I Observed)

<table>
<thead>
<tr>
<th>Position of elevons</th>
<th>Predicted Flight Path</th>
<th>Path of Test Flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right and left straight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right and left up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right and left down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right down, left up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right up, left down</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Does moving the elevons change the way the glider flies?

What happens when both elevons are in the up position?

What happens when both elevons are in the down position?

Does changing the position of elevons on a delta wing glider change its flight path?
Delt a Wing Glider

Draw the flight path

[Diagrams of a delt wing glider with dotted lines showing flight paths]
Objectives

The students will:
Construct a rotary wing model.
Define a mathematical relationship using a model.

Standards and Skills

Science
Science as Inquiry
Physical Science
Position and Motion of Objects
Science and Technology

Science Process Skills
Observing
Making Models
Controlling Variables

Mathematics
Problem Solving
Estimation
Measurement
Graphing

Background

Air must move across the surface of a wing to produce lift. To fly, birds and insects use a flapping motion to move the air over and around the wing surface. The wings of airplanes are attached to the fuselage in a fixed position. Lift is generated by moving the entire wing and body through the air. Helicopters are rotary wing aircraft; they rotate the wing surface through the air to produce lift.
Lift is produced by the pressure differences caused by the shape of rotating blades; this is the same way lift is produced by aircraft wings. The rapidly moving air over the top of the blade creates low pressure; the air beneath the blade is moving slower, so it creates higher pressure (see "Paper Bag Mask" pages 26-27, Bernoulli’s principle, for more information). High pressure under the rotor blades creates lift which causes the aircraft to rise.

Since the paper models have no motor, they only have one source of lift. As the paper models fall they will spin, imitating the rotation of the rotor blades of a helicopter. Because there is no thrust to produce upward movement, the helicopter will not fly upward, but the spin will reduce the rate of fall by producing lift, resisting the force of gravity.

NASA builds and tests experimental helicopters and tiltrotor airplanes in an effort to achieve lower noise levels and greater fuel efficiency. Models are tested in NASA’s wind tunnels at Langley, Lewis, and Ames Research Centers.
Materials
Plain white paper
Graph paper
Student Page with template and graph
Scissors
Measuring tape
Pencil or marker
3 m length of lightweight paper ribbon (or a strip of audiotape or videotape)

Management
The activity will take approximately 30-45 minutes.

Preparation
Open an old audio or videotape cassette and show the class the tape inside the cassette. The tape will be used for the activity.

Team students with a partner or in cooperative groups of three or four.

Make enough copies of the rotor motor template so each team may construct a rotor motor. Have students use the template to construct rotor motors.

Activity
1. Cut along the solid lines of the template.
2. Fold along the dotted lines. The propeller blades should be folded in opposite directions. X and Y fold toward the center, and Z is folded up to give the body rigidity, and lower the center of gravity.

3. Stand up and drop the rotor motor. Have the students write or draw what they observed.

4. Drop an unfolded piece of paper and the rotor motor. Which one falls faster? The paper falls faster because it is not continuously generating lift. The spinning rotor motor reduces the rate of fall by producing lift, resisting the force of gravity.

5. Have the students predict what will happen when they wad up the paper and drop it. It will drop faster than the sheet of paper and the rotor motor. The sheet of paper falls slower mainly because its larger surface area offers more resistance to the air than the compact, wadded paper.

6. Can you accurately count the number of rotations the rotor motor made as it descended? No—the rotations are fast and that makes accurate counting very hard.

7. To determine the number of rotations, (1) tape the cassette ribbon to the rotor motor, (2) stand on the loose end, and pull the rotor up so there are no twists in the ribbon, and (3) drop the rotor as usual. How does the cassette ribbon make counting the rotation easier? Each twist in the ribbon represents one rotation of the rotor motor. Counting the total number of twists equals the total number of rotations.
Assessment

1. The teacher can observe the construction activities in progress.

2. Formulate a rule describing the relationship between the number of twists and the drop height of the rotor motor.

Extensions

1. Have students experiment with helicopters made from different weights of paper. Graph the results.

2. Have students design a new rotor motor.

3. Have students determine relationships between the weight, height of launch, shape, and length of the blades.

4. Have students determine whether the blades turn in a clockwise or counterclockwise direction.

5. Have students increase and decrease the angle of incidence (see illustration) of the rotor blades, and determine if the new angles make the rotor motor rotate faster or slower, and if it flies longer.

6. Have students compare the flight of the rotor motors to that of a maple seed or a dandelion.

7. Seasonal variation: design paper helicopters shaped like bunnies, ghosts, or reindeer.

8. Construct a bar or line graph that shows the relationship between the number of twists and the drop height of the rotor motor.
Rotor Motor Templates

Wing A  Wing B

X  Y

Z

Wing A  Wing B

X  Y

Z
Rotor Motor
Flight

Interdisciplinary Learning Activities

Science

- Compare bats with airplanes.
- Discuss why some birds fly and some do not.
- Predict how aircraft will function in space (see NASA’s Lift-off to Learning: Toys in Space II video).
- Discuss why some plants have seeds that “fly.”
- Discuss why wind is important to flying.
- Compose a list of living things that fly and a list of those that do not fly.
- List safety concerns pilots address when flying in aircraft.
- Compare and contrast how helicopters and airplanes fly.
- Compare and contrast some of the different kinds of aircraft.

Mathematics

- Experiment building kites with different geometric shapes. Determine which kite flies the best.
- Determine how fast students can flap their arms. Graph and compare.
- Many birds migrate. Using a map, calculate how far some birds travel when they migrate.
- Make an aircraft drawing by connecting dots using numbers that require students to count by 2s or 3s.
- Test fly a paper or Styrofoam glider and determine the glide time. Record and graph results.
Fine Arts

- Design an airplane stamp.
- Outline the shape of an airplane using a meter-length piece of string or yarn.
- Create a song about flying.
- List popular songs that contain flying as a theme.
- Build kites shaped like musical instruments.
- Draw pictures of things flying through the air.

Technology Education

- Design and construct different types of kites. Experiment with the designs to determine which kites fly the best.
- Design and build different types of gliders or paper airplanes.
- Construct models of different aircraft using popsicle sticks.
- Make an airplane using common household items.
- Design a unique aircraft on a computer.

Social Studies

- Create a pictorial history of flying, including kites, balloons, helicopters, and airplanes.
- Discuss the impact flying machines have had on civilization.
- List the many jobs and careers that were created by the industry of flight.
**Language Arts**

- Create an ABC picture dictionary of flight.
- Read mythology stories such as Icarus that are related to flight.
- Locate stories about flying in the school library.
- Have students write poems about flying.
- Maintain a “Book Center” with flight-related stories for students to read.
- Write open-ended stories about flying and have the students complete them.
- Develop flash cards for the parts of an airplane.
- Have students spell their names using the International Phonetic Code Alphabet.
- Make a bulletin board using aviation words that begin with the letters of the alphabet.
- Have students who have flown write about their experiences.