Paper Airplanes

Grade Level: Elementary

Purpose: Students will understand how transportation and communication have developed over the ages and that geography plays an important role.

Objectives: 1. Students will describe and discuss methods and modes of transportation and communication (canoe, automobile, phone, computers).
2. Students will be able to describe the role geography played in the Wright Brothers first flight as well as their own paper airplane flight.

Materials: Direction sheet for paper airplanes
8 ½” x 11” paper
8 ½” x 14” paper
scissors
cellophane tape
ruler
paper clips
plastic straws
2-ply paper dinner napkins
thread
small toy
hobby knife
thin cardboard

Optional Materials:
colored construction paper
colored typing paper
Origami paper
markers
colored pencils

Resources:
Paper Airplane Book, by Peter Clemons, Lowell House
History of Flight by A.G. Smith, Dover Publications (coloring book)
http://www.geocities.com/CapeCanaveral/1817/pages.html
http://dir.yahoo.com/Recreation/Hobbies/Models/Aircraft/paper

Procedures:
1. Instructor will begin a discussion with class on modes and methods of communication and transportation: canoe, automobile, airplane, phone, computers.
2. Instructor will read or discuss the Background story of the Wright Brothers to the class.
3. Instructor will then pass out to each student a copy of the directions to make paper airplanes.
4. Instructor will then pass out the needed materials to make a paper airplane. (Have a plane made so that students see what the final product should look like).
5. Students will then make paper airplane.
6. As students are making their planes, have them:
   - Add color and flair to the planes.
   - Research symbols/patterns on planes of the past.
   - Don’t make the plane too heavy with crayons, markers, or paint.
   - Do display history of aircraft on side, and explain technological advances of that aircraft.
7. Once airplanes are built, the students will be asked to think about what the Wright Brothers would have had to know about geography before they could fly along with what they need to know to make their airplanes fly. Example: Can they fly in the rain? Can they fly through trees or bushes?
8. Instructor summarizes the activity by listing the important geographic considerations on the board that the students come up with.

**Additional Activities:**
1. Air contest for flight time and length
2. Display in library or classroom with pop-up for information.
3. Make a mobile with various planes designed and decorated.
4. Make a timeline of transportation and communication modes and methods.
5. Have students make a list of advantages and disadvantages to forms of transportation and communication.

All activities should emphasize the technology aspect from invention to the present.

**Benchmarks:**
SS.B.1.2.4- Knows how changing transportation and communication technology have affected relationships between locations.
**GEOGRAPHY STANDARD 11:** The patterns and networks of economic interdependence on Earth’s surface.
The Wright Brothers

The technology associated with human flight is considered by many people to be the most significant advancement in the 20th Century. The Wright brothers were not only brilliant thinkers and creative builders, but they were good geographers too. When planning their first flight, Orville and Wilbur new that their home of Dayton, Ohio would not be an appropriate place. They knew that they needed a location with a good place to take off from, a good place to land, and enough wind to help them fly. By selecting the site in North Carolina, they demonstrated their understanding of the importance of physical geography. Wind, sand, and the dream of flight brought Wilbur and Orville Wright to Kill Devil Hills, North Carolina, where they achieved the first successful airplane flight on December 17, 1903. These self-taught engineers relied on teamwork, the weather and the scientific process to get the first airplane off the ground.

So why does everyone talk about the Wright brothers flight from Kitty Hawk, North Carolina? Technology and geography once again played a role in shaping history. Orville Wright sent a telegraph sharing the good news of the first powered flight from a telegraph office in Kitty Hawk. Kill Devil Hills was an isolated area near Kitty Hawk and they both have unusual names. Everyone was so excited by the news that it is not surprising that they were confused about the location. After all, the flight was what was newsworthy and the telegraph came from Kitty Hawk! Newspapers added to the confusion when they picked up the dateline from Kitty Hawk and didn’t investigate the actual flight site.

The Wright Brothers National Memorial and the Memorial Pylon are reminders of the days when Orville and Wilbur Wright made this part of North Carolina their headquarters.

The Wright brothers also used the most advanced photographic technologies for the time to document this amazing event. They took more than 300 glass-plate photographs of their expeditions and travels. The negatives were donated to the Library of Congress and a microfiche publication entitled: Photographs by the Wright Brothers is available in many libraries today.

You may order reproductions from:

The Library of Congress
Photoduplication service
Washington, D.C. 20540
(202) 707-5640
This is a paper airplane design by Joseph Palmer, who has graciously allowed us to include it in the lesson plan. It was printed from his web site, and the address for this site is listed at the end of the directions.

Step 1
Fold an 8 1/2 x 11 sheet of paper down the middle of the 11" dimension. Don’t panic. Just look at the pictures. On the left I’ll show you what you’re starting with, and I’ll mark where you’re going to fold. On the right you’ll see what you should end up with after each step.

Step 2
Next fold the two upper corners in at a 45 degree angle. Be careful here to line these up, and do not let the flaps cross the middle of the paper. Use the middle fold as a guide.

Step 3
Fold each side, again using the middle as a guide. The two sides must be very even. These folds are the most critical for proper flight. Don’t crease these too hard, that creates a sharp edge and reduces the lift. (The plane will nose dive) If you leave these folds too rounded, the plane will tend to rise into a stall. When you get into flight testing, you can adjust the plane by messing with the sharpness of these folds.

Step 4
Fold the tip over, lining the pointy tip up with where the other folds meet in the middle. This provides both the proper center of gravity, and it makes the nose blunt so you won’t poke your eye out.
Step 5
Fold the plane down the middle and press it flat.

Step 6
Next we're going to fold a winglet. The fold should be parallel to the edge of the paper, and about 3/4 of an inch (19MM) from the ends of the wings. The little squiggles under the drawing show you how it would look if you held it up and looked at it from the back of the plane.

Step 7
Flip the plane over and fold the other winglet, using the first as a guide. Get them both very even with each other.

Step 8
Next we're going to make the fuselage or "body" of the plane. I usually fold the wing over to split the blunt end evenly, so that half ends up on the body, and half on the wing. Again the fold should be parallel to the paper.
Step 9

Flip it over and fold the other wing to create the completed fuselage. I usually run my thumbnail along all of the fuselage folds here to really crease the edges. Remember, DO NOT crease the leading edges of the wings too much, see step 3 for instructions.

Step 10

Almost done. Unfold the wings and winglets and work them until you get the shape you see on the right. There should be a very pronounced "V" shape in the wings, and the winglets should be at about a 90-degree angle to the wings. Now give it a gentle toss. Have fun.