ART TO ZOO

APRIL 1980

NEWS FOR SCHOOLS FROM
THE SMITHSONIAN INSTITUTION
Office of Elementary and Secondary Education
Washington, D.C. 20560

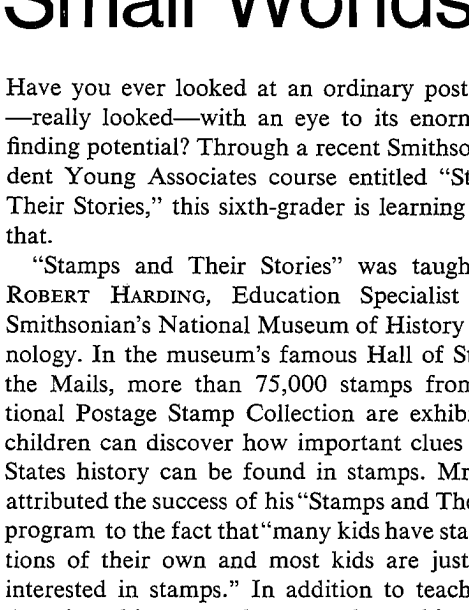
Small Worlds: Stamps as Storytellers

Have you ever looked at an ordinary postage stamp —really looked—with an eye to its enormous clue-finding potential? Through a recent Smithsonian Resident Young Associates course entitled "Stamps and Their Stories," this sixth-grader is learning to do just that.

"Stamps and Their Stories" was taught by MR. ROBERT HARDING, Education Specialist with the Smithsonian's National Museum of History and Technology. In the museum's famous Hall of Stamps and the Mails, more than 75,000 stamps from the National Postage Stamp Collection are exhibited. Here children can discover how important clues to United States history can be found in stamps. Mr. Harding attributed the success of his "Stamps and Their Stories" program to the fact that "many kids have stamp collections of their own and most kids are just naturally interested in stamps." In addition to teaching about American history, and many other subjects as well, stamps can help children to be better observers—and more aware of the everyday things around us.

Stamps in Your Classroom

There are essentially two kinds of stamps. *Regular issues* are infrequently changed in design and are always available in a range of values. *Commemoratives* are issued on a short-term basis to honor a particular person, place, or event. Although both kinds of stamps have their stories to tell, commemoratives are especially revealing. As miniature social documents that can be examined at first hand, commemorative stamps provide an inexpensive and convenient way of bringing a country, a culture, or a period of history dramatically to life, *right in your classroom.*



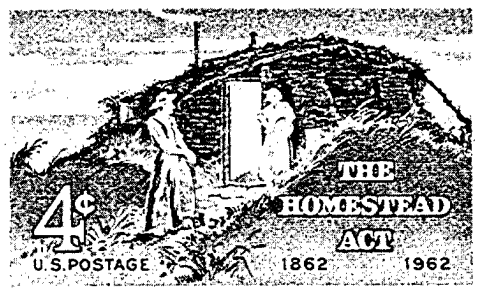
Photograph by Robert Harding.

Introducing stamps in your classroom involves two steps. The first step is to teach students how to look at a stamp and draw conclusions from what they see. The second step is to involve the children themselves in the stamp-making process in some way so that they can appreciate the problems and decisions faced by the stamp designer. In the history lesson that follows, MR. DAVID ESTABROOK of the Smithsonian's Office of Elementary and Secondary Education shows how you can *from stamps* teach your students to draw conclusions about important factors in the United States westward movement. The eight commemorative stamps on which Mr. Estabrook's lesson is based are recent issues purchased for less than $1.00 from a local dealer. Other stamp sources besides dealers include your post office, and mail order concerns that send you stamps on approval. (See the references listed in the *bibliography at the end of this article* for details on how and where to buy stamps.)

Lesson Plan: The Westward Movement

This lesson is designed to serve as an introduction to the complex and colorful subject of the westward movement in the United States in the 18th and 19th centuries. The stamps should be discussed in the order indicated, with the class divided into small groups. To show the stamps to the children, either use an opaque projector or provide each group with a hand lens and a copy of the stamp (mounted on cardboard and protected by plastic mylar) to pass around and look at. After searching the stamps for picture clues, the children will draw tentative conclusions, based on those clues, about the causes and effects of the westward movement.

Begin with **Stamp #1,** commemorating the hundredth anniversary of the Homestead Act. What clues to the westward movement can you find here? After asking the children to name some of the *means of transportation* the family pictured on the stamp might have used to reach the prairie, have the children state their opinions as to *why* the family might have moved west (to farm? to get free land from the government? to find equality of opportunity?) . . . and have them guess what hardships (wild animals? extremes in weather? Indians? food shortages? loneliness?) the family might have encountered on the way. Then ask the children to imagine themselves visitors to the sod hut—what would they find if they were to step inside?—and also to speculate on how living on the prairie in those days might have affected a person's character.



1

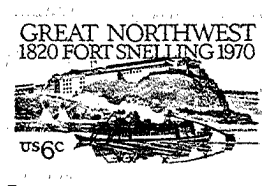
Encourage the children to respond freely to these questions and to identify the clues that are the basis for their answers. In identifying clues, the children might point out that judging from the *outside* of the house, the inside would almost certainly have been dark; either damp or dusty, depending on the season; small; and sparsely furnished. The children might also guess correctly that this treeless, unsettled land would have required its settlers to be hardworking, self-sufficient, and resourceful.

Seven more stamps (numbered "2" through "8") relating to the westward movement are reproduced here. What can students learn from them? **Stamp #2** marks the Bicentenary of Fort Harrod, Kentucky's first settlement, established in 1774. Here students might look for clues as to how the early settlers attempted to deal with some of the *hardships and dangers* found in the west and compare the situation of the Kentucky frontiersman with that of the sod-hut family discussed earlier. The other six stamps show various *means of transportation* used in going west and some of the people who took part in the westward movement, including *explorers* Father Marquette and Louis Joliet **(Stamp #3),** *homesteaders* racing to the Cherokee Strip **(Stamp #4),** *traders* near Fort Snelling, Minnesota **(Stamp #5),** and Missouri *settlers* **(Stamp #6).** The *Erie Canal* is shown also **(Stamp #7)** and there is a stamp commemorating trains and railroad history **(Stamp #8).** From this evidence, the student should be able to reach further conclusions about why people went west and how they got there. The children may also speculate about how the westward movement might have benefited not only the people who took part, but also the United States as a whole.

2

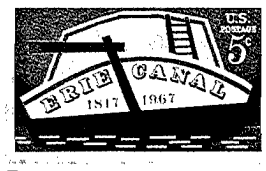
3

4



5

6



7

8

To sum up this introductory lesson on the westward movement, have each group of students invent a story about one of the stamps. Woven into each story should be the four key factors discussed earlier and shown graphically on this chart. As the children tell their stories, record these key factors on the chalkboard and leave them there to be returned to and modified as the children continue their study of the westward movement.

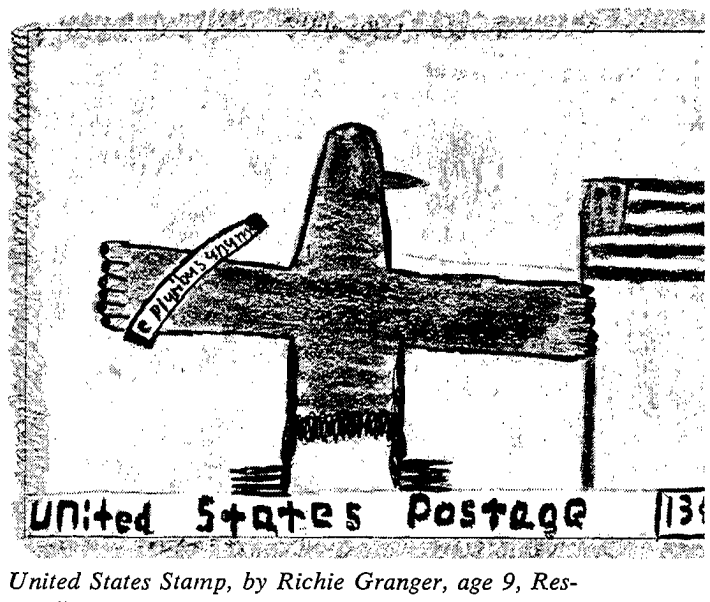
KEY FACTORS IN THE WESTWARD MOVEMENT

Name of Stamp	1 Purpose of Going West	2 Trans-portation Used	3 Hardships Met	4 Benefits Derived

Design Your Own Stamp

A good follow-up exercise to any lesson built around stamps is to have students design their own stamps representing their country, their state, their neighborhood, themselves, or some area of classroom study. Give each child the opportunity to think ahead of time about the particular aspects of his subject he wants to stress. Discuss how such things can be communicated through the use of symbolism, as well as through drawings of real people and events. Then explain to the children there are three conditions that a stamp must satisfy. First, as a receipt for prepaid postage, a stamp must show clearly its *denomination.* Second, a stamp must give obvious indication of its *country of origin.* And third, it must be the *right size* —small enough to be handled easily, yet large enough to carry its message plainly.

"United States Postage" stamp by Richie Granger (one of Mr. Harding's students) illustrates these principles of good stamp design. What clues to our system of government can you find in Richie's stamp—miniature social document and storyteller?



United States Stamp, by Richie Granger, age 9, Reston, Va.

continued on page 4

Watch Out for Cemeteries!

Every town has one. Most towns have two or three. Close to where you're teaching now, quite possibly within walking distance of your school, watch out and you'll find a cemetery.

And in that cemetery large or small—on wooden or stone markers, elaborate or simple—your students may find clues to the people and events, the values and social patterns, of their community and the nation itself. This article suggests just a few of the many possible ways that you can draw on that wonderfully rich but often neglected curriculum resource—the cemetery near by.

Where to Look

Let your fingers do the walking first. The best place to begin looking for a cemetery to visit is under the heading, "Cemeteries and Memorial Parks," in the Yellow Pages of your telephone directory, where public cemeteries are listed as well as cemeteries for many different ethnic groups, religious denominations, and fraternal organizations.

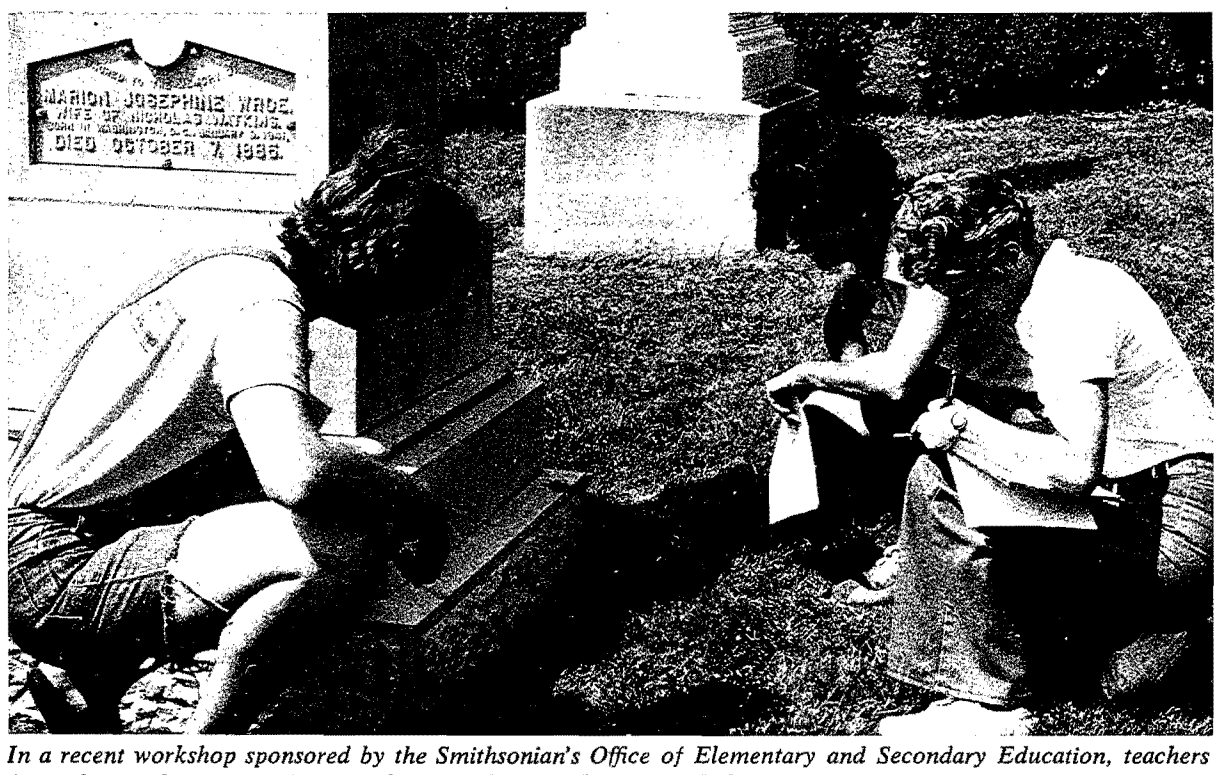
The phone book by no means tells the whole story, however; for it is exceedingly common, in both rural and urban areas, for family plots and even entire graveyards to be hidden away in unexpected places. Possible locations for such "pocket cemeteries" include country hilltops; parks and grounds surrounding city, county, and state buildings; churchyards; and university campuses. Information about these and other cemetery locations may be gotten from such sources as old city maps (available from your city clerk, planning office, local historical society, or the local history section of your library) . . . U.S. Geological Survey topographic maps (often on file in libraries or available from surveyors and civil engineering firms) . . . morticians and funeral directors . . . oldtimers around town (who may know not only the locations of out-of-the-way plots but also who is buried in them) . . . stonecarvers, foresters, surveyors, and county maintenance crews.

Once you have found a cemetery to visit—and permission for the outing has been obtained from the cemetery office and from your students' parents—you are ready to think carefully about the purpose of your visit and to develop a teaching approach in line with your curriculum objectives.

Developing an Approach

In the teaching approach that follows, the graveyard is seen as a *small universe of tangible evidence,* which can serve as a powerful stimulus to further inquiry when used to introduce a unit of study on "the community."

Essentially the plan is this: In the cemetery, students work in teams to gather information about their community. Then back in the classroom, they organize their data and, utilizing their cemetery evidence, draw tentative conclusions that subsequently are refuted or reinforced by additional evidence found in textbooks, census figures, old newspaper accounts, burial records, town histories, and other sources. Each team is assigned to one section of the cemetery (referred to in this article as a "survey plot"), containing between twenty and twenty-five tombstones apiece. One member of each team records his team's observations on a CEMETERY WORKSHEET *(shown here).*



In a recent workshop sponsored by the Smithsonian's Office of Elementary and Secondary Education, teachers from the Washington, D.C., area discover that wonderfully rich but often neglected curriculum resource—a local cemetery.

Back in the classroom, reading, writing, and math skills are brought into play as the information recorded on the worksheets sparks inquiry into the age of the community, the ethnic composition and origins and socioeconomic status of the people, changing life spans within the community, and community heroines and heroes.

- *Age of the Community.* After comparing notes to see which team has found the oldest tombstones in the cemetery, the children complete this statement on the chalkboard: "The oldest tombstone in this cemetery, dated _____ shows that this community is at least _____ years old." More information about the age of the community is then sought from town histories and other sources.
- *Ethnic Composition and Origins.* A composite list of the names and birthplaces recorded on the worksheets is drawn up. From this evidence, the children reach conclusions—which later may be corroborated by census reports—about the community's ethnic composition.
- *Socioeconomic Status.* After exhibiting their drawings of a "rich man's grave" and a "poor man's grave," the children discuss how a tombstone may reflect a person's social status and how a graveyard may be an indicator of a community's wealth.
- *Changing Life Spans.* The children subtract the birth date from the death date for every person in their sample to find each individual's life span. Then they figure average life spans from the 1870s and the 1970s to determine whether people in their community today are longer or shorter lived than citizens of a hundred years ago.
- *Heroines and Heroes.* After evidence gathered in the cemetery about important town figures has been recorded on the chalkboard and discussed, each student draws on sources such as personal interviews and town histories to create a written or visual portrait of his favorite community heroine or hero.

By the end of their unit on "the community," the children will have learned a lot, not only about their own town or city but also about a means of familiarizing themselves with other communities as well, through that small universe of tangible evidence, the cemetery near by.

What Else Can You Learn?

All these things and a whole lot more can be learned in a cemetery! In fact, virtually any subject in your curriculum, from geology to language arts, may be pursued to immense advantage there. What follows are just a few suggestions.

- *Geology.* Rock hounds of all ages will enjoy finding the answers to such "cemetery questions" as: From what kinds of rock are the markers made? What characteristics do these rock types have that make them good choices for tombstones? Are these rock types found locally, and if not, where *do* they come from? Are different rock types used in different time periods? Does the style of inscription seem to vary with the rock type used, and if so, what might be the reason for this variation?
- *History.* Launch a study of an era—say the nineteenth century. What first names did the people in your community have then? How long did they live? How old were they when they married and began having children? What do the stones' inscriptions reveal about people's beliefs and values? Students may also enjoy learning how to roughly date a tombstone from its shape and style of ornamentation and the kind of stone from which it was carved. *Underfoot* and *Early New England Gravestone Rubbings,* two books listed in the bibliography at the end of this article, contain guides to dating tombstones.
- *Social Science.* Conduct a full-scale study of man's population growth. Through the use of interment or burial records and visits to local cemeteries, older students can research the population makeup and growth of their community over a given time period —say the past 100 years—with highly instructive results. For details, see "A Grave Situation" by R. Lynn Bondurant, Jr., *listed in the bibliography at the end of this article.*
- *Art.* Have the children make rubbings and photographs of gravestone designs and do research on graveyard symbolism. Then stage a school exhibition of these materials that will draw the attention of your community to this very important—and often overlooked—form of American folk art. *Early New England Gravestone Rubbings, Underfoot,* and *My Backyard History Book, all listed in the bibliography,* are sources that will help you here.

For a microcosmic view of man and the universe, there is no place like your nearest cemetery—where fascinating journeys begin.

Cemetery Worksheet

1. Find the oldest tombstone in your survey plot and enter the date right here:

2. List all of the last names of the people buried in your survey plot. If any birthplaces are recorded on the tombstones, list those too.

Last Name	Birthplace	Last Name	Birthplace

3. Find a rich man's grave and a poor man's grave and make a sketch of each.

4. Write down the birth and death dates of all the people you can find in your survey plot who died in the 1870s and all the people you can find who died in the 1970s.

1870s		1970s	
Birth date	Death date	Birth date	Death date

5. Write down any information you can find about war veterans, political figures, or other important people buried in your survey plot.

Bibliography

Bondurant, R. Lynn, Jr. "A Grave Situation." *Instructor* (April 1977): 110–14.

Gillon, Edmund Vincent, Jr. *Early New England Gravestone Rubbings.* New York: Dover, 1966.

O'Malley, Celia. *Look Out for Churches.* London: Victoria and Albert Museum, 1977.

Weitzman, David. *My Backyard History Book.* Covelo, Calif.: Yolla Bolly Press, 1975.

———. *Underfoot: An Everyday Guide to Exploring the American Past.* New York: Scribner's, 1976.

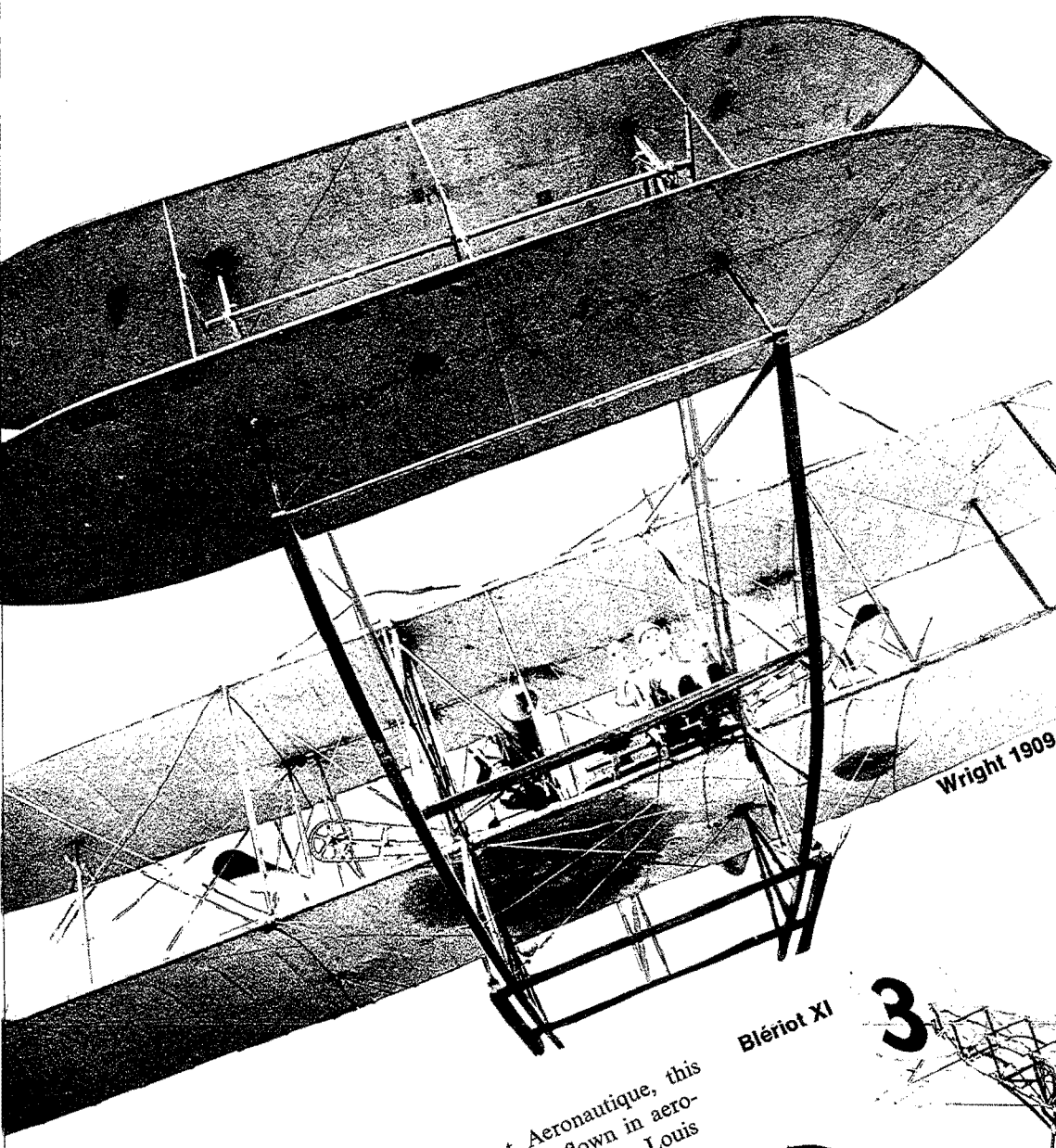
The first half of the second decade of the 20th century (right before the outbreak of World War I) was an exciting time to be alive in the United States. Among many other developments, the women's suffrage movement was gaining national momentum; the Model T Ford was replacing the horsedrawn carriage as a faster, more practical means of getting around; and the United States was gaining credibility as a leading power in international affairs. It was a time when anything seemed possible—including man's age-old dream to fly.

In 1910 the field of aviation was still in its infancy. The age of powered flight had begun just seven years earlier in 1903, when the Wright Brothers succeeded in flying a heavier-than-air craft at Kitty Hawk, North Carolina. Although a few individuals were now experimenting with the use of aircraft for commercial purposes, there was as yet no general consensus as to what the practical applications of the airplane might be. Flying was still confined mainly to races, displays, and demonstrations—enormously popular with the public.

The following photoessay is based upon a new exhibition in the Smithsonian's National Air and Space Museum, designed to evoke the mood and excitement of an early aero show of the period 1910 to 1913. Three of the most important aircraft featured in the exhibition are pictured here in the hope of acquainting you and your students with the unique character of some of the early flying machines that helped to open the highway of the skies for mankind.

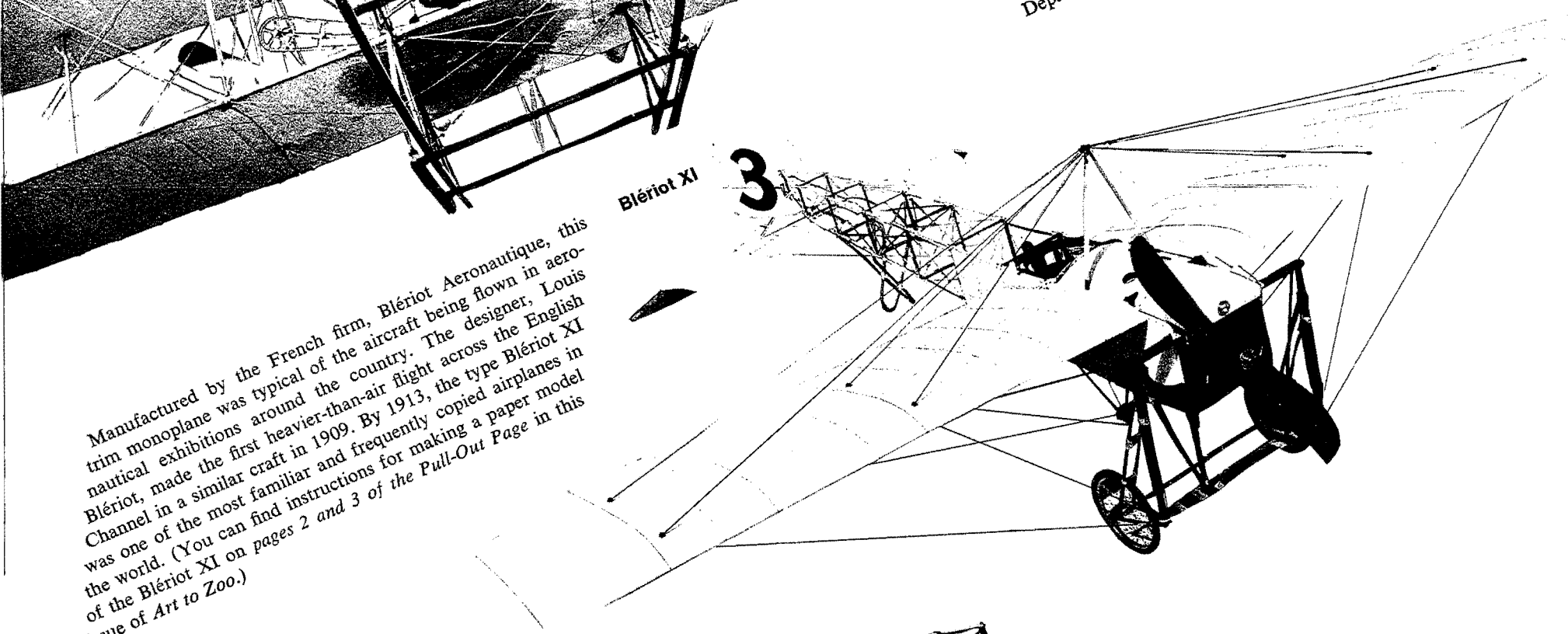
In studying these photographs, you will see that airplanes in those days usually had either one or else two pairs of wings*—and most had open cockpits. All were made from wood, with metal fittings and wire bracing. The wings, and often the bodies, of the aircraft were covered with cloth that had been treated with a special chemical compound so that the plane would be airtight.

Highway of the SKIES



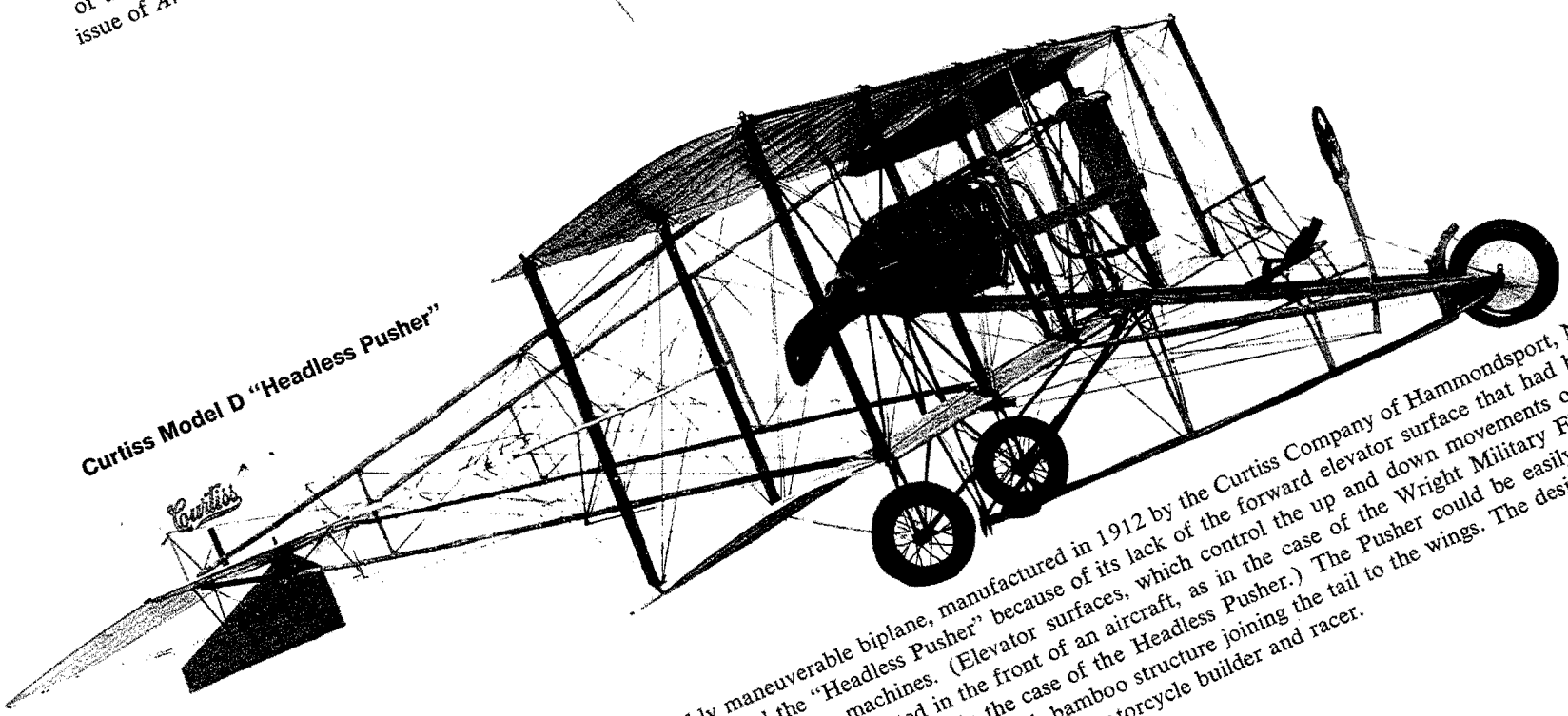
Wright 1909 Military Flyer

The world's first military aircraft, this plane was built for the U.S. Army Signal Corps by the Wright Brothers in 1909. The Military Flyer was used for reconnaissance (scouting or searching) operations. This plane was presented to the Smithsonian by the War Department in 1911.



Blériot XI

Manufactured by the French firm, Blériot Aeronautique, this trim monoplane was typical of the aircraft being flown in aeronautical exhibitions around the country. The designer, Louis Blériot, made the first heavier-than-air flight across the English Channel in a similar craft in 1909. By 1913, the type Blériot XI was one of the most familiar and frequently copied airplanes in the world. (You can find instructions for making a paper model of the Blériot XI on *pages 2 and 3 of the Pull-Out Page* in this issue of *Art to Zoo*.)



Curtiss Model D "Headless Pusher"

This highly maneuverable biplane, manufactured in 1912 by the Curtiss Company of Hammondsport, New York, was called the "Headless Pusher" because of its lack of the forward elevator surface that had been used on earlier Curtiss machines. (Elevator surfaces, which control the up and down movements of an airplane, were sometimes located in the front of an aircraft, as in the case of the Wright Military Flyer, and sometimes in the tail section, as in the case of the Headless Pusher.) The Pusher could be easily assembled, and featured a rugged, high-strength bamboo structure joining the tail to the wings. The designer of this craft, Glenn Curtiss, was also famous as a motorcycle builder and racer.

*Airplanes having one wing are called *monoplanes*. Airplanes having two wings are called *biplanes*.

continued from page 1

BENJAMIN FRANKLIN STAMP CLUBS

Why not start a stamp club in your school? To get young people interested in stamp collecting, the United States Postal Service is sponsoring Benjamin Franklin Stamp Clubs for grades four through six. Membership is free. Imaginative resource materials are provided. For information, contact your local postmaster, who may obtain details from the manager of the Retail Branch of the Regional Office.

Bibliography

Bloomgarden, Henry S. *American History Through Commemorative Stamps.* New York: Arco, 1969.

Hatcher, Scott. *1977 Standard Postage Stamps Catalogue.* 4 vols. New York: Scott Publishing, 1977.

Hobson, Burton. *Getting Started in Stamp Collecting.* Rev. ed. New York: Sterling, 1976.

Lidman, David. *New York Times Guide to Collecting Stamps.* New York: Golden Press, 1970.

Reinfeld, Fred. *Fun With Stamp Collecting.* New York: Doubleday, 1957.

Turner, Jim. *Stamps: A Guide to Your Collection.* New York: Lippincott, 1963.

U.S. Postal Service. *For the Fun of It: A Helpful Guide for New Stamp Collectors.* Washington, D.C.: U.S. Government Printing Office.

Art to Zoo brings news from the Smithsonian Institution to teachers of grades three through eight. The purpose is to help you use museums, parks, libraries, zoos, and many other resources within your community to open up learning opportunities for your students.

Our reason for producing a publication dedicated *to promoting the use of community resources among students and teachers nationally* stems from a fundamental belief, shared by all of us here at the Smithsonian, in the power of objects. Working as we do with a vast collection of national treasures that literally contains the spectrum from "art" to "zoo," we believe that objects (be they works of art, natural history specimens, historical artifacts, or live animals) have a tremendous power to educate. We maintain that it is equally important for students to learn to use objects as research tools as it is for them to learn to use words and numbers—and you can find objects close at hand, by drawing on the resources of your own community.

Our idea, then, in producing *Art to Zoo* is to share with you—and you with us—methods of working with students and objects that Smithsonian education staff members have found successful. This is the third of four issues published in Nov./Dec., Feb./Mar., April, and spring/summer of this school year.

ART TO ZOO
is a publication of the
Office of Elementary and Secondary Education
Smithsonian Institution, Washington, D.C. 20560

Editor: Ann Bay (202) 381-5351

Regular Contributors:
THE ANACOSTIA NEIGHBORHOOD MUSEUM
THE CHESAPEAKE BAY CENTER FOR ENVIRONMENTAL STUDIES
THE COOPER-HEWITT MUSEUM OF DECORATIVE ARTS AND DESIGN
THE HIRSHHORN MUSEUM AND SCULPTURE GARDEN
THE MUSEUM OF AFRICAN ART
THE NATIONAL AIR AND SPACE MUSEUM
THE NATIONAL COLLECTION OF FINE ARTS and the RENWICK GALLERY
THE NATIONAL MUSEUM OF HISTORY AND TECHNOLOGY
THE NATIONAL MUSEUM OF NATURAL HISTORY
THE NATIONAL PORTRAIT GALLERY
THE NATIONAL ZOOLOGICAL PARK

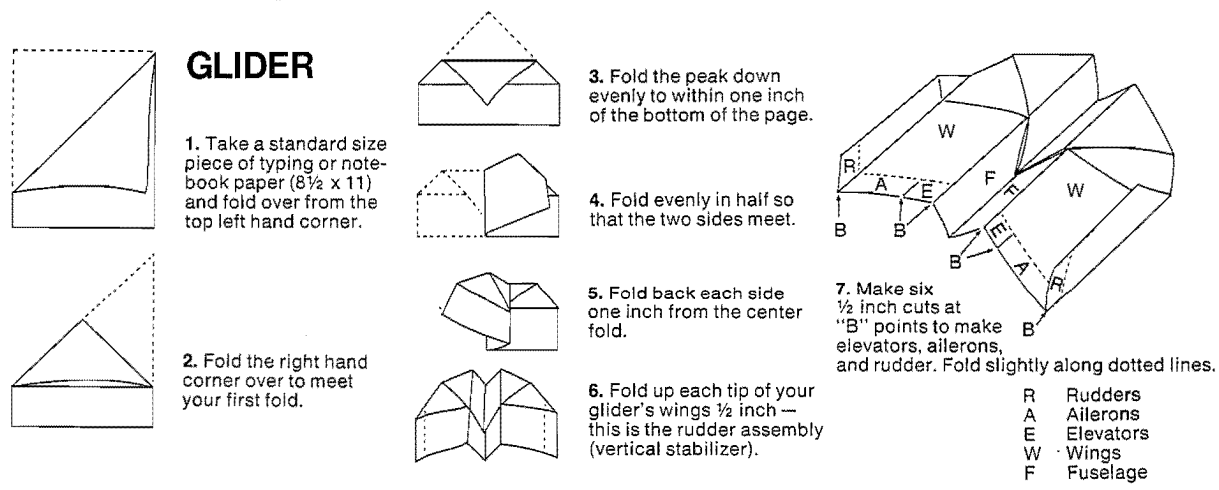
Smithsonian Institution Press
Designer: Carol Hare
Associate Editor: Ruth W. Spiegel

Lift and Drag: Hang Gliders and the Principles of Flight

The men who built and flew hang gliders during the closing years of the 19th century laid the foundation for the first successful flying machines. German aeronautical pioneer Otto Lilienthal was the most influential of this group of early "test pilots" who sought to develop a stable glider as the first step toward powered flight.

The 1894 National Air and Space Museum glider *(shown here)* is considered the most successful of Lilienthal's designs. The wing and tail surfaces are covered with cotton cloth, and a horizontal stabilizer is connected to the frame by a pivot at the front of the rudder. The wings are designed to fold for ease in transportation and storage. The pilot was suspended between the wings by bars that passed underneath his arms. By moving his legs and torso, he could alter the center of gravity location so as to maintain limited control. Lilienthal made glides of up to 350 meters (1150 feet) in gliders of this kind. Hang gliding is today a popular sport in many parts of the country.

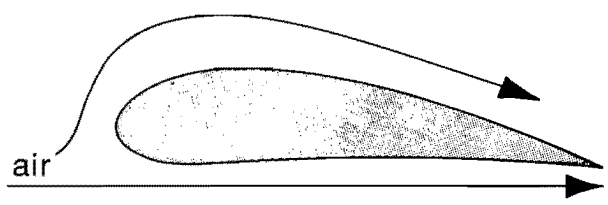
Directions for making a paper glider.



Lift and Drag

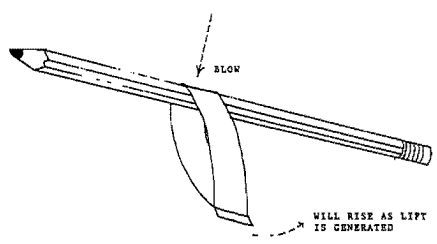
Two principles of flight basic to all gliders and airplanes are "lift" and "drag." The following explanation of these two principles is based on an interview with RICHARD HALLION, Curator, Department of Space Science and Exploration in the Smithsonian's National Air and Space Museum.

Lift is the force that acts on the wings of a glider or an airplane, causing the aircraft to rise into the air and stay there during flight. By studying a cross section of a typical airplane wing like the one shown here, your students should be able to see that the air flowing over the curved upper section of the wing must travel farther and therefore faster than the air passing under the flat, lower surface. This causes a pressure change which pulls the wing upward.



Cross section of a typical airplane wing.

To see exactly how this principle works, *students might now try constructing an airfoil.* Bend a 6" x 1" strip of paper around a pencil, fastening the ends of the strip together with a piece of tape, and creasing the paper slightly where it touches the pencil *(see sketch).* If you then hold the pencil and blow



Sketch of airfoil, demonstrating LIFT.

directly down onto the bent part of the strip, the taped ends will rise, demonstrating that *lift* has been created by the difference in air pressure on the top and bottom surfaces of the airfoil.

Drag is the resistance of a solid body, like a glider or an airplane, to the air through which it moves. While airplanes and gliders are *streamlined* to reduce drag, they also have devices for deliberately creating drag when needed. For example, the "speed brakes" that slow down an airplane are in essence flat surfaces that can be extended to increase drag.

To learn more about the phenomenon of drag, the children might try playing "human airplane." By running across the schoolyard holding pieces of cardboard turned first against the wind on the flat side and then into the wind on edge, students will quickly get a feel for drag, the second important principle of flight. A third basic principle of flight is *thrust,* which in the case of an airplane is supplied by engine power.

The paper glider diagrammed here illustrates to some degree the first two basic principles of flight. The diagram is taken from the "Teacher's Guide" to *Flight: the Sky's the Limit,* a 1975 Smithsonian Institution television film by David Wolper and Associates. Either show the diagram to your students using an opaque projector, or duplicate it for classwide distribution. Then have the children carefully follow the accompanying *directions to make paper gliders* of their own. (For best results, a ruler should be used to measure the rudder, ailerons, and elevators of each glider before cutting and folding.)

In flying their gliders, students should know that the ability to remain stable and also to maneuver in flight is made possible by controlling the flow of air over the surface of a glider or an airplane. This is done by means of small moveable parts, which can be adjusted to alter the aircraft's movements. The gliders your students have built have ailerons and elevators on the wings, and a rudder on the vertical part of the tail. By moving the elevators up slightly, a student can make his glider climb; by moving the elevators up further he can make his glider fly in a loop. If he moves the elevators down, he can make his glider go into a nosedive.

With the elevators set slightly up, a student can move the right aileron slightly down and the left one slightly up, and the glider will roll to the left. By then moving the rudder to the left, a left turn can be executed. To turn the glider right, he can simply reverse this process. By experimenting with other small movements of these control surfaces, many other maneuvers can be accomplished. After some practice, the children should become expert at predicting—*prior to launch*—the paths that their models will take.

Only the sky's the limit when through active investigation with real materials, your students let their imaginations soar to gain a solid grounding in the principles of flight!

Students make paper gliders in a Smithsonian Resident Young Associates course on "Flight."

Pull-Out Page

Grave Matters

Now that spring is here, it's time to get outdoors again. And in case you're looking for a place with great possibilities, we have a fine suggestion you may not have thought of. One of the most interesting places in your community is your nearest *cemetery!*

There are many things you can do in a cemetery. Enjoy the quiet. Sit under the trees. Read what is written on the gravestones. Draw or photograph different gravestone designs and shapes. And before you leave, be sure to make a gravestone rubbing.

Making a gravestone rubbing is a wonderful way of recording something beautiful out of the past—to keep for your very own. Once you have made *one* rubbing, you will probably want to make more. Many people collect rubbings from different cemeteries they have visited.

Here is what you'll need:

- masking tape
- a large sheet of thin paper (roll ends of newsprint—which you can get from your local newspaper printing plant—work especially well)
- a piece of colored chalk
- a can of spray fixative (hairspray works fine and is relatively cheap)

Here is what you do:

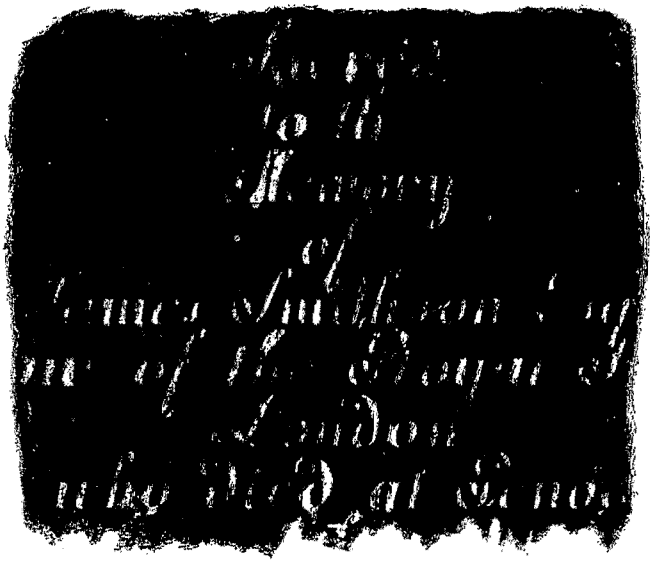
1. Choose a stone having a carved message or design that you would like to copy. (In making your selection, you may be interested to know that different gravestone designs have different meanings. Each design stands for something special. For example, birds stand for the soul; trees stand for paradise or for human life; angels stand for heaven.)

2. Tape the piece of paper to the face of the stone so that it covers the whole surface and wraps around the edges. The paper should be stretched as tightly as possible and fastened securely with the tape so that it won't move around while you work.

3. Rub the side of the chalk against the paper, using an even, up-and-down motion. As you rub, the surface of the stone will come up dark, leaving the carved-out design and lettering in white.

4. When you have finished your rubbing, remove it from the stone (being sure not to leave any tape behind) and spray the rubbing with fixative. On the back of your rubbing, write your name, the date, and the name of the cemetery where the rubbing was done.

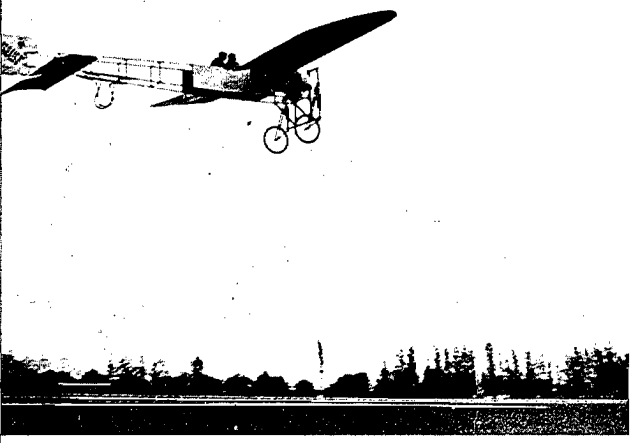
Now there you've done it! In less than half an hour, you've recorded a beautiful piece of the past to keep for your very own.



Rubbing of part of the inscription on James Smithson's tomb in the Smithsonian Institution, Washington, D.C.

Make a Model of a Blériot XI

Based on materials by RICHARD P. HALLION
Drawings by SUSAN WHITMORE



1918 photograph of Blériot XI in flight. From the collection of the National Air and Space Museum, Washington, D.C.

Here are instructions for making a model of an early airplane. The plane is called the Blériot XI.

Like other early airplanes, the Blériot XI was made from wood, with metal fittings and wire bracing. The wings of the craft were covered with cloth. Your model will be made mostly from construction paper. Besides construction paper you will need: a lump of clay, a toothpick, scissors, carbon paper, a ballpoint pen, and some glue.

Here is what you do:

1. Using carbon paper and a ballpoint pen, trace the patterns for the different parts of your model *(see page opposite)* onto construction paper. These parts are: the fuselage (or body) of the craft, the wings, the tail, the propeller, and the rudder. (On a real airplane, the propeller works to pull the aircraft through the air, and the rudder is used to turn the aircraft.) When you are all finished tracing, cut out each part.

2. Cut out a flat-ended circle in the center of the body of the fuselage, *as shown,* to make the cockpit. (The cockpit of an airplane is where the pilot sits.)

3. Cut out two slots for the wings of the plane and five slots for the tail section, *where shown.*

4. Fold the fuselage lengthwise along the four longer dotted lines. Then lightly glue the hatched area (/////) of the fuselage and press this glued area under the opposite flap to make the fuselage box. Wait for a minute or two to let the glue dry. Then fold the nose flap under.

5. Take a piece of clay the length and thickness of your little finger and roll it into a tight ball. Place this ball inside the nose of the aircraft and tape down the nose flap.

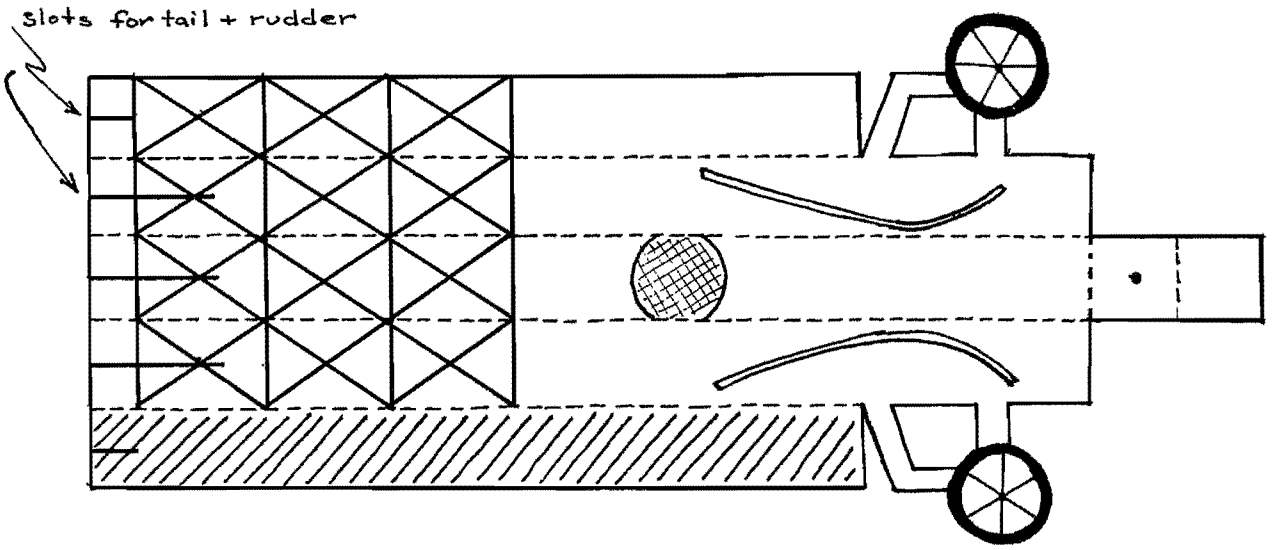
6. Take another, smaller, lump of clay (about the size of a small pea) and place it against the outside center of the nose of the aircraft, over the dot. Then pin the propeller through the clay to the nose of the craft *as shown.*

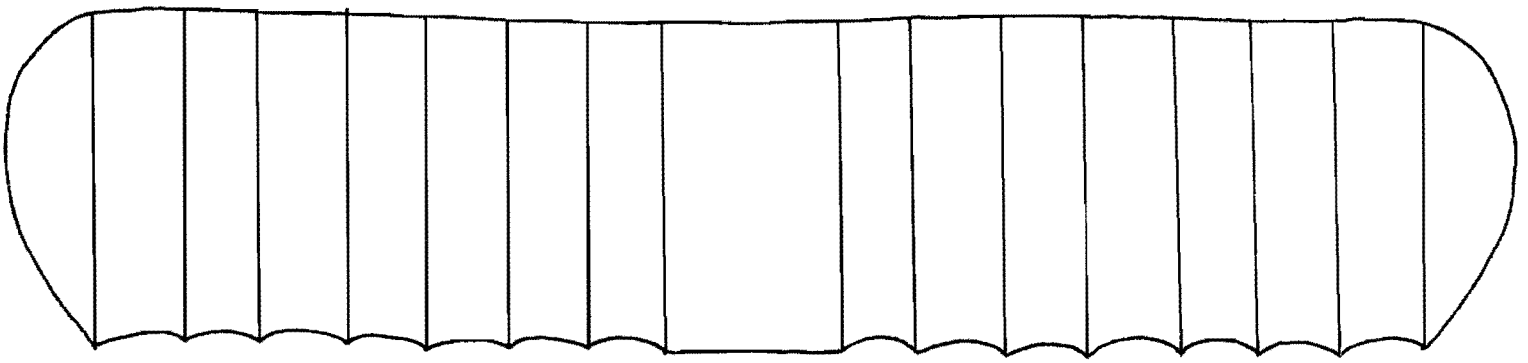
7. Stick a toothpick through the center of the wheels to make the axle.

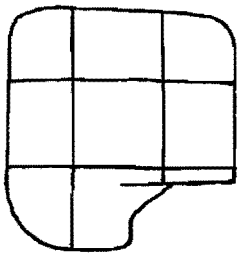
8. Slide the wings through the wing slots and glue them in place.

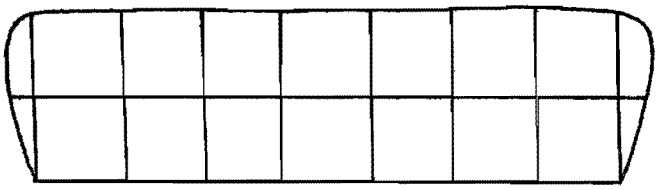
9. Assemble the tail section in the order shown and glue each part in place.

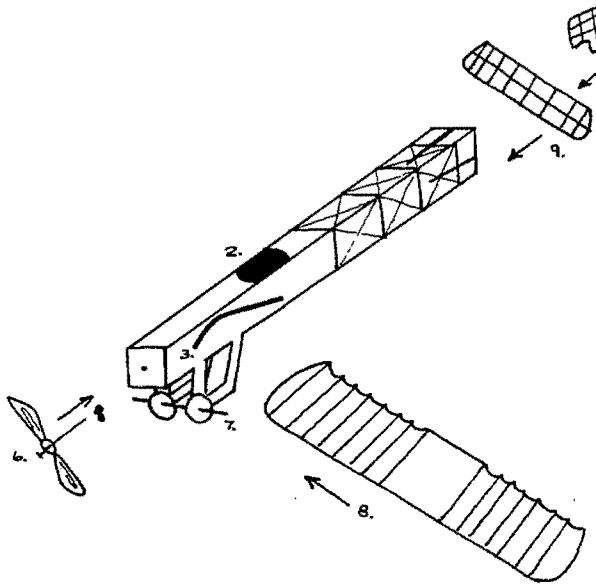
Now try flying your Blériot XI. If properly balanced, with the right amount of clay, it will fly in a straight line and land gracefully, *as shown in the drawing here.* However, it may tend to go into a nosedive or do backward flips, *as shown with dotted lines in these drawings.* Nosedives can be corrected by removing a small amount of clay; backward flips can be corrected by *adding* clay, a little at a time.



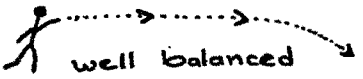


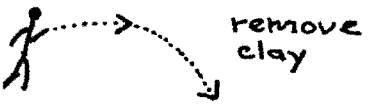






TRIMMING FOR FLIGHT

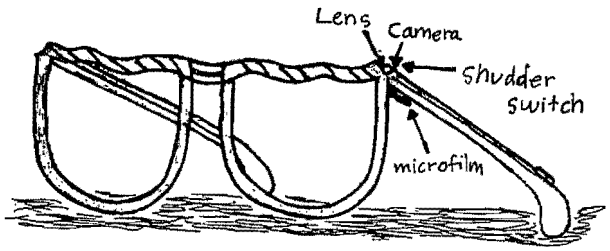




Design Your Own Detective Camera

Last winter *Art to Zoo* ran a contest for our readers called "Design Your Own Detective Camera." For this contest, we asked you to send us your ideas for very small cameras that could be hidden away in unexpected places (like a cigarette pack or the heel of a shoe), cameras that could be used to take pictures secretly. Here are just a few of the good ideas you sent us.

Explanation: As if to tip your glasses up, further on your nose, you could secretly hit the shudder switch and no one would know what you're doing.

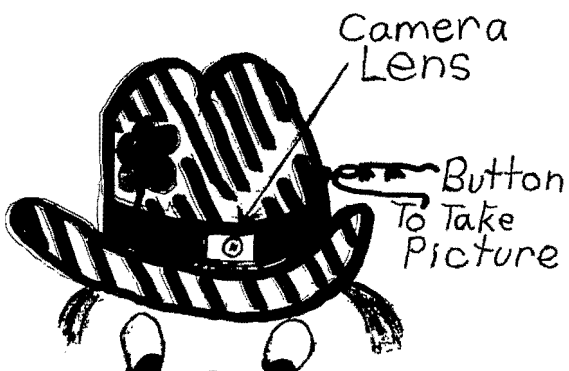


Idea + Drawing

Kent Smucker
Joe Dunham
Urbana, Ohio

Timothy Richard Houge
Manson, Iowa

Detective Camera



You can act like you are scratching your head and press the button.

Breck Morgan
Prospect, KY

fold along dotted line