ART TO ZOO

News for Schools from the Smithsonian Institution. Office of Elementary and Secondary Education. Washington, D.C. 20560

September1991

Kiting Up the Sky: The Vehicles of Understanding

Written by Ann Bay

After decades of being a toy that appeared for only a few weeks each spring, kites have made a comeback. In fact, some people are even talking of a "Kite Renaissance."

Now you can—in your school classroom—capitalize on this worldwide resurgence of interest in kites and kiting. This issue of ART TO ZOO is designed to give you and your students a perspective on the importance of kites, not only as toys but also as highly versatile and practical devices that have figured prominently over the years in many areas of human endeavor, from weather forecasting to bridge building, to military reconnaissance. We've included for class discussion an explanation of how kites fly, as well as an outline of the history of kiting. In addition, there are directions (on the Pull-Out Page) for making a rather modern kind of kite known as a "sled." By following these directions, your students can demonstrate for themselves LIFT, WEIGHT, THRUST, and DRAG, the basic principles underlying most kinds of flight, including the flight of airplanes and gliders, as well as kites. A collection of kite-inspired writing exercises by Tom Lowderbaugh serves to round out the issue. And now to begin at the beginning, with some important kite facts.

Eric Long

Sisters Jeannie (in front) and Meghann Long flying kites in front of the Smithsonian "Castle," on the Mall, in Washington, D.C.

Important Kite Facts: What is a Kite? . . . and How Does It Fly?

A kite is a tethered heavier-than-air craft that derives its lift solely from the air. A kite depends on the wind to overcome gravity . . . and all kites, regardless of their size or shape, have these three features:

- one or more surfaces to be acted on by the wind
- a bridle to hold the kite at an efficient lifting angle
- a flying line to keep the kite from blowing away.

The deltoid-shaped kite illustrated on this page shows the arrangement of these three features on a traditional kite with a wood frame.

The basic forces enabling the flight of kites (and also of airplanes) are these: LIFT, WEIGHT, THRUST, and DRAG. Lift is an upward force. Weight is a downward force. Thrust is a forward force. And drag is a backward force. Look at the two pictures below.

The difference between the flight of a kite and the flight of an airplane is that a kite is held in position by the flying line and derives its life from moving air (the wind). An airplane, on the other hand, is moving *into* the air, powered by engines.

Once your students have a visual picture of the forces enabling a kite to fly, they should be able to grasp the significance of the various developments in kite design and application that have occurred over the years. Now, here for class discussion, is a brief, anecdotal history of kites.

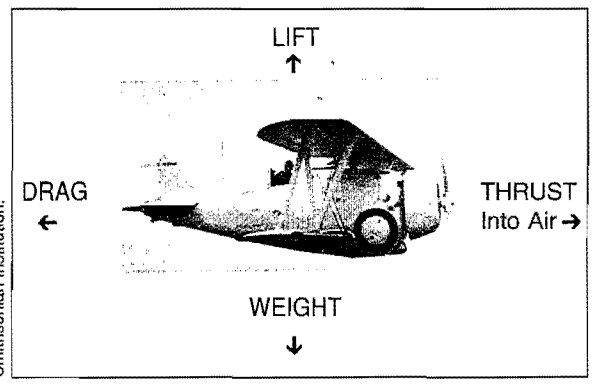
Class Discussion on the History of Kites

People have long dreamed of flying, and airplanes and spacecraft are direct results of this dream. Besides these history-making inventions, many recreational activities have been developed involving flight—including hot air ballooning, sky diving, hang gliding, and the throwing of boomerangs, frisbees, and paper gliders. Older than any of these activities, however, is kite flying, which dates back to around 1000 B.C.

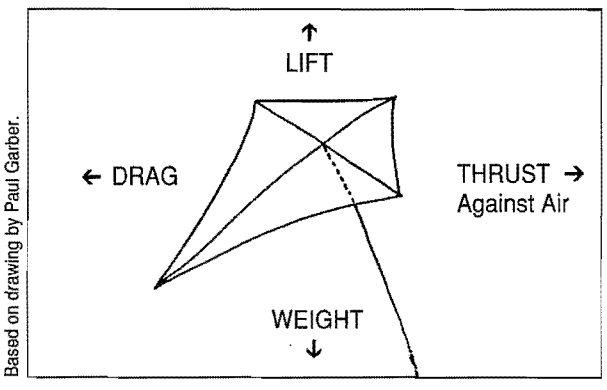
China is usually considered the place of origin of the kite. Although no one knows for certain when or how the world's first kite was flown, a favorite theory is that a Chinese farmer whose hat blew off in the wind was so fascinated to see that his hat could "fly" that he later attached a string to it and launched it as a kite. Silk, produced in China as early as 2600 B.C., may have been an important material from which early kites were made, as most likely was paper. Broad leaves and frames of sticks or bamboo strips may also have provided the makings for early kites.

One of the earliest legends of kiting is that of General Han Hsin, who helped to establish the Han Dynasty as one of the most powerful dynasties in Chinese history. In 206 B.C., the general and a small band of soldiers camped outside the walls of a palace controlled by the enemy. The problem facing Han Hsin was how to conquer the well-fortified palace with only a few soldiers. After some consideration, Han Hsin built a kite and sent it aloft until it flew over the palace walls. Then he carefully marked the length of line that had been required for the kite to go that distance. This told his soldiers how long a tunnel they would have to dig to get inside the palace walls and take the enemy by surprise—which is exactly what they finally did! Thus Han Hsin won his battle and the kite victoriously entered recorded history.

Continued on page 2



National Air and Space Museum, Smithsonian Institution.



Based on drawing by Paul Garber.

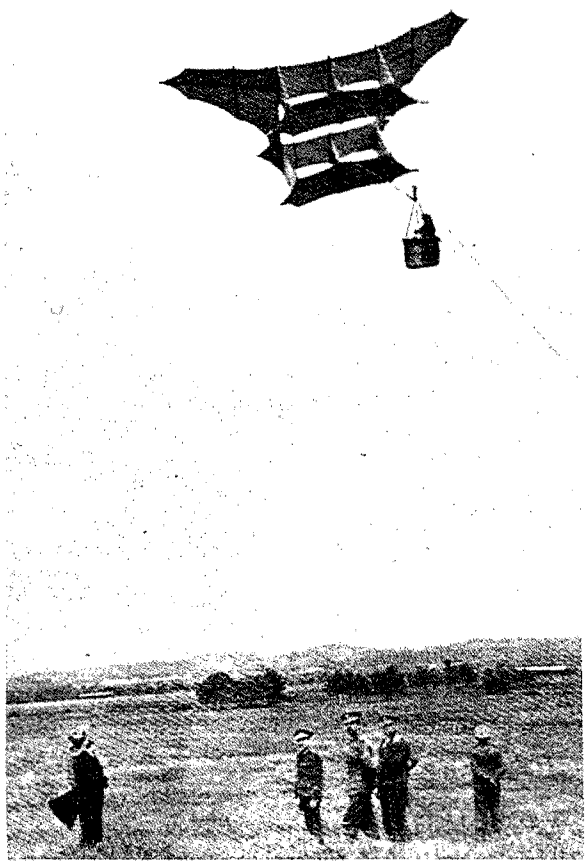
The same forces act on both airplanes and kites. (The airplane is a Grumman XF2F-1, a U.S. Navy fighter plane dating from the mid-1930s.)

continued from page 1

From that day forward, down through the centuries, the kite has proven itself a highly versatile invention. Here are just a few of the innovative—and often useful—functions that kites have served over the years!

Lazy floating. Your students may be familiar with Benjamin Franklin's famous kite experiment proving that electricity provided by lightning produces the same effects as electricity of human manufacture. What the children may *not* know is that Benjamin Franklin *also* used a kite for fun, to tow himself across a lake while floating on his back.

Boat towing. In 1903, Samuel F. Cody crossed the English Channel in a boat towed by kites.



National Air and Space Museum, Smithsonian Institution

A kite designed by Samuel Cody carries a military observer aloft in a basket. This picture was taken in 1904, the year after Cody had crossed the English Channel in a boat towed by kites of the same type.

Weather watching. An early use of kites for meteorological purposes occurred in Scotland in 1749, when Thomas Melville and Alexander Wilson attached thermometers to kites. The thermometers were outfitted with small parachutelike devices, which slowed their descent to earth, preventing breakage of the thermometers when they were released from the kites at different altitudes. Readings of these thermometers showed that air was cooler at higher altitudes.

After that, kites were commonly used for weather observation. In fact, for many years, up until 1933, the United States Weather Bureau operated kite stations to obtain data on temperature, humidity, wind velocity, and altitude.

Fishing. For centuries, fishermen from certain islands in the Pacific Ocean have used kites made of leaves to catch a tasty fish called the needlefish, which swims near the surface of tropical waters. A lone fisherman paddles his canoe out to sea, flying a kite high above the water. From the kite, a line extends to the surface of the water. At the end of this line is a lure made of spiderwebs. When a needlefish strikes this lure, its teeth and gills become entangled in the web. Then the fisherman reels in the line and removes the fish.

Antenna lifting. In 1901, Guglielmo Marconi, inventor of the wireless telegraph, used a kite to send up the antenna that received the first transatlantic telegraph signal.

Bridge building. When building the first railroad suspension bridge over the Niagara River near Niagara Falls, New York, a big challenge for the engineers was how to get a cable across the water. They finally solved this problem by holding a kite-flying contest. In 1846, young Homan Walsh made history when he flew his kite from the New York side of the river and snagged the kite line on a tree on the opposite (Canadian) side. His kite line was then tied to a rope, and the resulting rig was used to pull the wire cable across the river.

Horse power. In 1826, George Pocock, an English schoolmaster, developed a method of pulling a carriage with kites at speeds of up to twenty miles an hour.

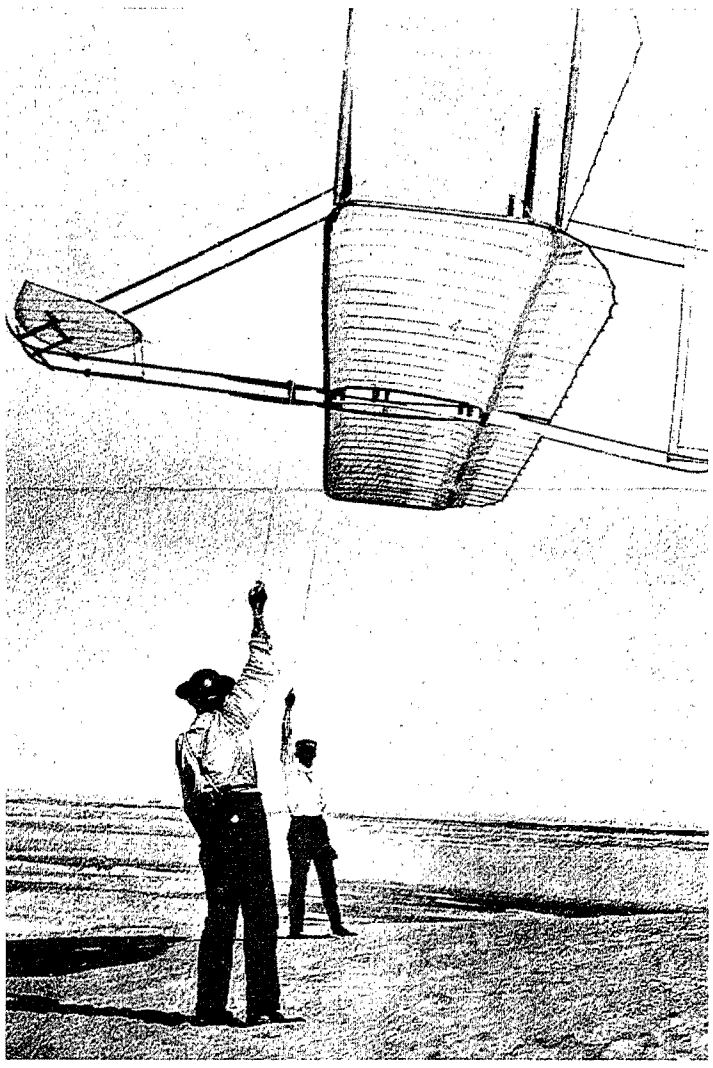
Aerial photography. The first photographs showing the extensive devastation of the 1906 San Francisco earthquake were taken by a giant camera—*heavier than a piano*—attached to a train of high-flying kites.

Scaring the enemy and other military uses. From the time that kites were first invented until the advent of the airplane (and even since then), kites have been put to all kinds of military uses by different countries. For example . . .

- An early Chinese legend tells of a general who attached lanterns and noisemakers to kites and flew them at night over his enemy's camp. The enemy was so frightened by the mysterious "spirits of the night" that it fled without a battle.

- For many centuries, manlifting kites were used in the Orient to send up spies to observe the enemy. Much later, in the late 1800s, this method of reconnaissance was adopted in the West, when British Captain B. F. S. Baden-Powell began to build and fly "Levitor" kites. Baden-Powell's system was capable of lifting a "spotter" about one hundred feet into the air to observe and photograph the enemy.

- During World War II, U.S. Navy Lieutenant Paul Garber,* developed "target kites" for use by the Navy and the Army. Manipulated by two flying lines and a rudder, these kites could be steered through all sorts of fancy maneuvers, such as loops, dives, and figure eights, thereby providing excellent practice targets for aircraft gunners.



National Air and Space Museum, Smithsonian Institution

The Wright brothers, Wilbur and Orville, learned the elements of airplane control through experiments with kites and gliders.

Once your students have been introduced to the above ways in which kites have figured prominently in a historical context, the children may enjoy thinking of some ways that they *themselves* might use kites toward practical (or frivolous) ends, such as sending secret messages . . . keeping picnic lunch bags out of the reach of ants and hungry dogs . . . or visibly marking the location of your house by flying a kite from the yard so that guests can easily find you next time you have a party. Make a list of the children's ideas on the chalkboard and discuss with the class whether they think each idea would really work—and *why* or *why not*. If individual students want to later try out some of their ideas on their own, they should be encouraged to do so, with an emphatic caution from you that NEVER, EVER, EVER SHOULD THEY TRY LIFTING THEMSELVES . . . OR ONE ANOTHER . . . OR ANY OF THEIR PETS . . . INTO THE AIR WITH KITES!

As the next point in class discussion, tell the children that some of the most significant of practical kite experiments in history were conducted during the 1800s in connection with the development of early airplanes. Those were the days when engineers, inventors, and adventurers were hard at work trying to make the dream of manned flight a reality. In their Dayton, Ohio, bicycle shop, Wilbur Wright built a box kite, rigged it with four flying lines, and flew it in a nearby meadow. For several years, he and his brother Orville built gliders and after testing them as kites, piloted them from the sand dunes near Kitty Hawk, North Carolina. From these experiments, the Wright Brothers learned the elements of airplane control.

Even after the 1903 Wright "Kitty Hawk Flyer" made the first controlled, powered, and sustained airplane flight, the Wright brothers, along with others in the great race to develop the airplane, continued their interest in kites. However, except for experimental purposes, kite design seemed to lose its challenge and diversity for a while. For several decades, only traditional deltoid-shaped kites, along with occasional box kites, were flown—and then mostly just "for fun." During World War II an important revival of a serious interest in kites occurred with the use of kites as targets for sea-to-air gunnery and other military purposes.

Then, in 1948 a new era in kiting began. Francis and Gertrude Rogallo invented the Flexikite, which used V-shaped longitudinal sections, rather than sticks, to determine its shape.

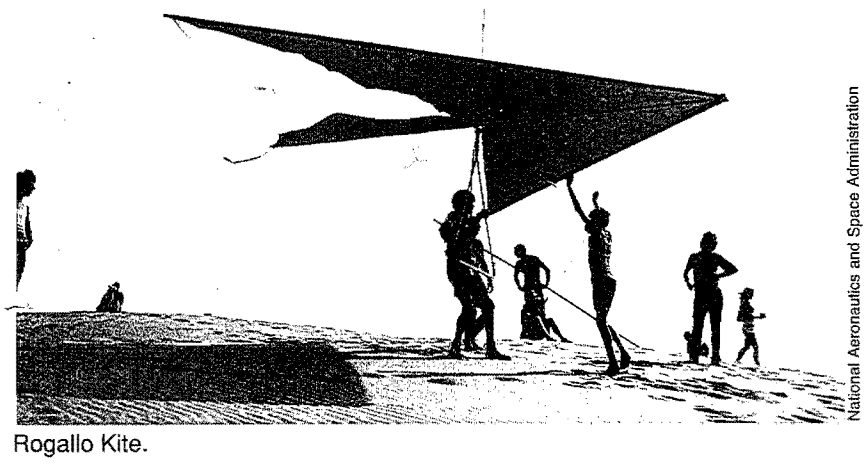
The Flexikite did not, however, immediately change the status of kiting; rather its real significance became apparent later on. Indeed, some of the impetus for the "Kite Renaissance" we spoke of earlier in this article came from the NASA space program. After the Russians launched Sputnik in 1957, Francis Rogallo, working as an aeronautical engineer, used the wind tunnels at Langley Research Center in Virginia to adapt his kite designs for use on returning spacecraft. Rogallo's kites were written up in scientific journals, in kite magazines, and in newspapers. Then other people began to explore possibilities for flexible kites.

During the past twenty-five years, the basic fashion in kites has changed considerably owing to the development of flexible kites and the appearance of lightweight "space-age" materials. The new flexible kites are more durable and more portable than the traditional kites with wooden frames. Furthermore, the sheer *flexibility* of flexible kites enables them to adapt to a wide range of wind conditions.

An important type of kite requiring no rigid frame is the Jalbert Flexifoil. Invented by Domina Jalbert of Boca Raton, Florida, the Flexifoil resembles a portion of an airplane wing and is composed of a number of cells that are inflated to airfoil shape by the pressure of the wind. Made in various sizes ranging from about one yard to about 300 square feet, the Jalbert Flexifoil is widely used today for high-altitude meteorological research.

Another form of modern kite is the so-called "sled," which is characterized by a concave surface and two or three vertical sides. This kind of kite flies when air pushes up from underneath it to make a concave shape. Various models of the sled kite were developed by an inventor named William Allison over a period of approximately thirty years, from the late 1940s to 1977.

In the Pull-Out Page, you and your students will find directions for making a sled kite based on a design patented by Allison in 1956. The children can easily make and fly this particular model on their own, if they follow our instructions carefully. We suggest the children work in pairs and that you photocopy or otherwise reproduce enough copies of the Pull-Out Page to enable each pair of students to have its own set of instructions.



National Aeronautics and Space Administration

Rogallo Kite.

*Paul Garber, the Smithsonian's resident expert on kites, is now Curator Emeritus of Aeronautics at the National Air and Space Museum in Washington, D.C.

Kite Rites: Writing About Kites

Written by Thomas Lowderbaugh

Once you've actually gone and *flown* a kite, what could be better than to write about the experience, or about kites in general? Here are some writing activities that can help your students take what they have learned about kites and pull it together in a way that will make sense to *them*. And in the meantime, the children will get the chance to exercise their abilities to work with words creatively. By letting their imaginations soar, they will be able to sail away with their kites right in their own school classroom.

Kite Poems

Poems are fun to learn about when students work from the inside, as poets. Poems are games: fun to write, fun to read. Like other games, poems follow rules. It's working inside these rules—*and even knowing how to bend them*—that excites people when they write poems. And it's recognizing the rules and how writers work with them that excites people when they *read* poems. (In this respect, poetry isn't really very different from tennis or football or marbles.)

The rules of poetry are called *form*. And you can best introduce the concept of form to your students—showing them how form works and why it matters—by having them actually write their own poems. To do this, I suggest a simple form called a *diamante* (from the French word for "diamond") because of its shape. The *diamante** is especially appropriate for kite poems because most people still think of kites as having old-fashioned diamondlike shapes. The rules for the *diamante* are simple:

line 1: one word naming a thing
line 2: two words describing that thing
line 3: three words describing the thing in action
line 4: four words expressing a feeling about the thing
line 5: another single word for the thing named in line one.

Here is one example of a *diamante* written about a kite:

Kite
Strong, fragile
Soaring, diving, circling
Fresh, free, tingling, delighted
Wind-lover

Of course, the form is free for adaptation. You might, for example, want to insert between *line 4* and *line 5* an additional line giving two more words describing the kite. Here is an example of this longer kind of *diamante:*

Kite
Plastic, tiny
Rippling, dipping, tearing
Cold, tense, shivery, scared
Crashed, smashed
Adventurer

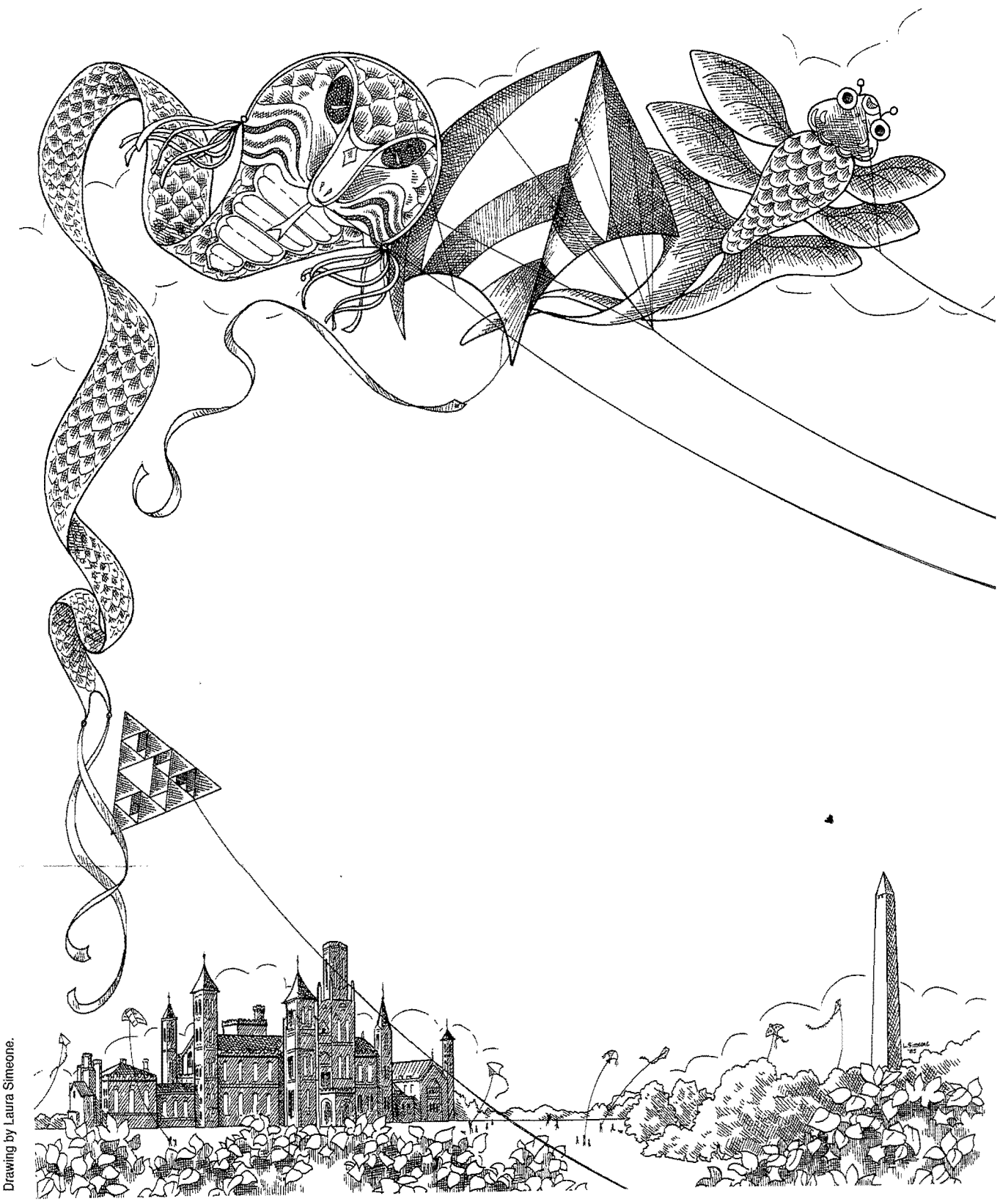
Kite Stories

Everyone loves a story. We love to listen to stories . . . *and* to tell them. In learning about kites, your students must have garnered some real-life experiences or, at least, had some fantasies and emotions relating to the subject. What better way, then, for the children to explore their feelings about kites—and maybe even extrapolate from their actual experiences—than by writing stories about kites and kite flying?

Here again the children will need a starting point; this time a "what if" situation is recommended as a way to begin. For example . . .

- the day my kite flew away with me
- the first time the principal flew a kite
- my little sister (or brother) flies a kite
- the time I won a kite-flying contest
- what happened to my kite the day it flew away all by itself

*For a fuller discussion of *diamantes*, see James Moffett and Betty Jane Wagner. *Student-Centered Language Arts and Reading, K-13: A Handbook for Teachers*, 2d ed. (Boston, 1976), p. 263. I am indebted to Moffett and Wagner's discussions of writing narrative and dialogue.



Drawing by Laura Simeone.

Kites flying over the Smithsonian Mall, Washington, D.C.

In developing these situations into stories, your students will be learning important writing skills and concepts. For example . . .

Reading stories always leads us to ask, "What happened next?" In *writing* stories, students must therefore learn to answer that question. By thinking about what happens next, the child's attention is directed to *chronology* as a means of putting the pieces of a narrative in order. Writing stories also introduces the concept of *character development*. From what someone says and does, we learn about the kind of person he or she is. Storywriting helps students discover for themselves the range of materials that writers can *and do* use in character development.

Your students might even *borrow* characters, actions, or events from books they have read and then experiment with this material to see how it might be adapted to their own use. For example, how might this or that favorite fictional character fly a kite? What adventures might he or she have in the process? How would he or she act if the kite were to crash? In borrowing material from other authors, students get to look at books from the inside and to see what choices those authors have made. By this method, the children may also begin to discover that being able to write well is not a magical gift bestowed on just a few lucky individuals, but rather a basic human skill that they themselves can master.

Writing can also help students learn to pay attention to real details and to discover the significance of ordinary events in their own lives. A way to give your students practice in selecting and using such meaningful details in their writing is to help them focus their attention on their own personal experiences. Point out to the children that real daily experiences are what capture readers' interest. For example, *what exactly* happened when your kite got caught in the tree? How did it happen? How did you feel about it? What did you do?

Kite Talk

Writing dialogue—concentrating just on *talk* rather than action—may provide your students with new insights into how people communicate; and it may also help to sharpen children's listening skills. Here, as a final exercise, are some situations designed to give your students practice in this important kind of writing . . .

- a conversation between my kite and me
- a conversation between my kite and the tree it's caught in
- a conversation between me and a cloud
- a conversation between two people flying kites
- a conversation between two flying kites

As your students write about kites—whether in poems, stories, or dialogues—they can sail away with their imaginations, no matter what the weather. In the process, they can relive, and often expand upon, their own experiences. And best of all, they can make sense of what they have learned, transforming kites from simple toys into true vehicles of understanding.

Jeff Tinsley

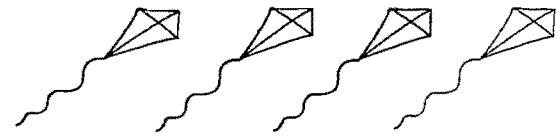
Glimpse of the 1989 Kite Festival. National Air and Space Museum Historian Emeritus Paul Garber, who organized the original festival in 1967 and has served as master of ceremonies ever since, is wearing a tie.

Smithsonian Kite Festival

Every spring around cherry blossom time, the Smithsonian holds a festival for kites: 1991 was the silver anniversary of this free event, which is jointly sponsored by the National Air and Space Museum and the Resident Associates Program.

People from all over the United States and abroad attend the festival, which includes a kite display, film, and tips on kite flying . . . and a kite-flying contest.

Participants in the kite-flying contest must have made their own kites. The kites have to be capable of flying at a minimum altitude of 100 feet for at least one minute. Trophies and ribbons are awarded in many age groups and categories, including "bird," "airplane," "funniest," and "team" (one kite flown by three or more fliers).



Bibliography

Books for teachers

Botermans, Jack and Alice Weve. *Kite Flight: 40 Models Ready for Takeoff.* New York: Holt, 1986.

Hart, Clive. *Kites: An Historical Survey.* New York: Appel, 1982.

Newman, Lee Scott, and Jay Hartley Newman. *Kite Craft: The History and Process of Kite-making throughout the World.* New York: Crown, 1974.

Pelham, David. *The Penguin Book of Kites.* New York: Penguin, 1976.

Rowlands, Jim. *The Big Book of Kites.* New York: St. Martin's, 1988.

Yolen, Will. *The Complete Book of Kites and Kite Flying.* New York: Simon and Schuster, 1976.

Books for children

Marks, Burton, and Rita Marks. *Kites for Kids.* New York: Lothrop, Lee, and Shepard, 1980.

Moran, Tom. *Kite Flying Is for Me.* Minneapolis : Lerner, 1984.

Schmitz, Dorothy C. *Kite Flying.* Mankata, Minn.: Crestwood House, 1978.

Thiebault, Andre. *Kites and Other Wind Machines.* New York: Sterling, 1983.

Wahl, Jan. *The Wonderful Kite.* New York: Delacorte, 1970.

Yolen, Jane. *The Emperor and the Kite.* Cleveland: Collins, William, and World, 1967.

ART TO ZOO
is a publication of the
Office of Elementary and Secondary Education
Smithsonian Institution, Washington, D.C. 20560
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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 contain 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 staff members have found successful.

For help with this issue of ART TO ZOO we are especially grateful to:

JOAN COLE of the Smithsonian Resident Associates Program, who supplied Kite Festival information and pictures.

PAUL E. GARBER of the Smithsonian's National Air and Space Museum, whose critical eye and thorough knowledge of the subject of kites and kiting have assured the straightforwardness of the approach and the accuracy of the content.

GIRL SCOUT TROOP 1297 of the Nation's Capital Girl Scout Council, who tested and refined the instructions for making a sled kite from a trash bag.

JANICE MAJEWSKI, of the Smithsonian's Office of the Assistant Secretary for Museums, who further tested and refined the sled kite instructions—and also illustrated them.

RUTH SHEETS, who volunteered her time to contribute in many ways as a Research Assistant.

This issue updates the May 1983 ART TO ZOO. Much of the issue is based on materials written and photographs selected by freelance writer Beth Kent.

High Time To Fly Your Own Kite

Question: Why did Dennis the Menace have so much trouble "teaching" his kite to fly?

Answer: Like many other people who fly a kite for the first time, Dennis made the mistake of running with his kite while trying to launch it. This mistake is one of the most common errors of kite flying. Here is what to do instead:

Choose a day when steady winds are blowing at speeds of between four and fourteen miles an hour. The day you choose can be any time of year, as long as it isn't raining or snowing and the wind conditions are right.

Then find a safe, open space. Treeless hilltops, playgrounds, fields, and wide beaches are some of the best places for kite flying. You'll want to avoid such hazards as powerlines, trees, tall buildings, and traffic.

Stand facing your kite with your back to the wind. With one hand, hold the kite by the towing point. With the other hand, hold your reel of flying line. When the wind begins to push against the front of your kite, let out a little line and pull gently as the wind lifts your kite into the air. Then gradually let out more and more line, giving a little tug each time you do. Soon your kite will be soaring high in the sky. If it starts to dip, pull in the line until it starts to rise again.

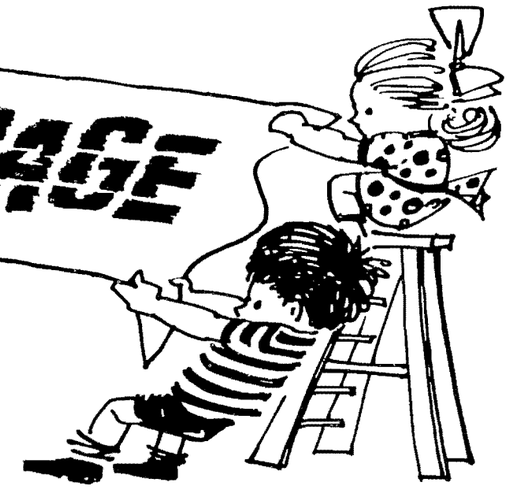
After a good day of kite flying, you'll want your kite to have a happy landing. In bringing in your kite, the important thing is to take your time. Wind in the string slowly and evenly. It may be easier for you to walk toward your kite as you reel it in. Once your kite has returned to earth, treat it gently . . . and you'll be able to fly it again and again.

DENNIS the MENACE

Dennis the Menace ® used by permission of Hank Ketchum and by Field Enterproses, Inc.

ANSWER:
The name of the famous mystery inventor is Alexander Graham Bell.

PULL-OUT PAGE



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Famous Mystery Inventor: Can You Guess WHO?

The inventor in this photograph put together many silk-covered triangles to make very large kites. These kites were so stable in flight that he thought perhaps he might build an airplane from a similar design. In 1907, he lifted a man 168 feet in the air using a kite made from more than 3,000 little triangular cells! This photograph shows the inventor and his grandson landing one of the giant kites.

You may know this kite maker as the inventor of the phonograph and the telephone. Can you guess who he is?

Answer appears at end of Pull-Out Page.

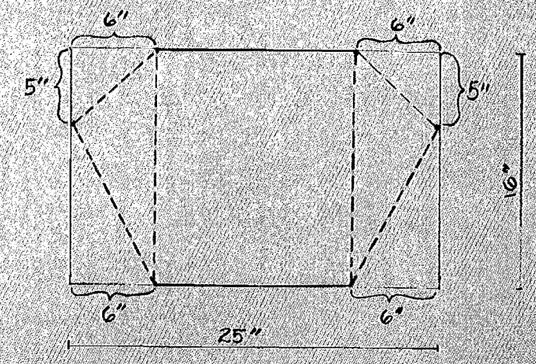

Figure A

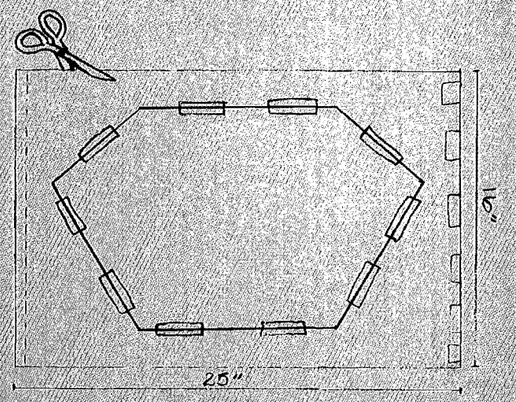

Figure B

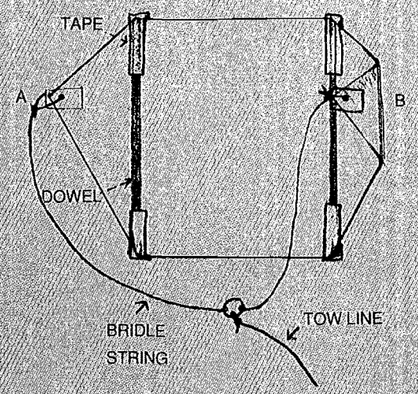

Figure C

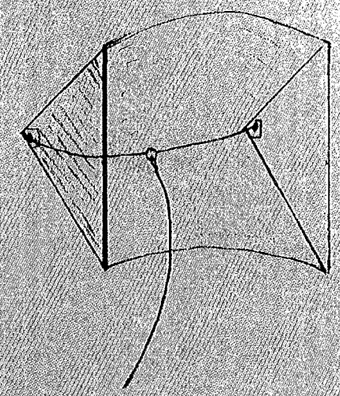

Figure D

Drawings by Jan Majewski

Can a Trash Bag Fly?

Turn one into a kite and find out. It really *does* fly!

You will need:

- one plastic trash bag, 24" x 30" or larger
- two wooden dowels, 1/4" in diameter and 16" long
- strong string: 3 feet for a bridle line; 60 yards for a flying line
- one cardboard tube from a roll of paper towels
- a red or yellow marker
- a full sheet of newspaper
- scissors
- a yardstick ruler
- masking tape, 1 inch wide or wider

1. With a friend to help you, make a pattern for your kite. Spread out the sheet of newspaper on a tabletop or the floor. Then using your ruler and a red or yellow marker, draw on the newspaper a rectangle measuring 25" x 16". Next measure 6" in from both ends of each of the two 25" sides of your rectangle, and place a big dot at each of these four points. Now using your ruler, connect each top dot with the bottom dot directly underneath it by drawing a straight line as shown in Figure A.

Now measure 5" in from the top of each of the two 16" sides of your rectangle and place a big dot at each of these two points. Draw a straight line from each of these two dots to the four points on the 25" lines as shown in Figure A.

This will give you the finished pattern for your kite. Cut out the pattern to make a six-sided shape as shown in Figure B.

2. Next tape closed the open end of the trash bag. Lay the trash bag out flat on the floor or table, and lightly tape the pattern to the trash bag (see Figure B). Now with your scissors, cut through the tape all along the edge of the pattern. As you cut, remember that the trash bag has two layers and you must cut through both layers, being careful not to let the bottom layer slip. When you have finished cutting, you will have made two six-sided plastic shapes from your pattern. Each one of these shapes will make a kite. Keep one plastic shape for yourself and give the other one to your friend.

3. Now attach the dowels and bridle string to your plastic shape to make a kite. Lay the dowels on the shape, from top to bottom, as shown in Figure C. Tape down the dowels with 4"-long pieces of masking tape, as shown, sticking about 1" of the tape over the end of the dowel and onto the back of the kite. Then using two more 4" pieces of tape, cover points "A" and "B" (as shown in Figure C) on both the front and the back of the kite. Punch a small hole ¼" in from point "A" and another small hole ¼" in from point "B". Next fold your 3-foot-long piece of bridle string exactly in half. Rest your finger in the fold, and ask your friend to tie a knot with the bridle string around your finger. Remove your finger from the knot to leave a loop in the center of your bridle string. This loop is called the towing point. Then tie the two ends of the bridle string through the holes you have made near points "A" and "B" (as shown in Figure C).

4. Finally, tie one end of the flying line securely around the paper towel roll tube. Wrap all but the last yard of line around the tube. Tie the loose end of the flying line securely to the towing point.

You are now ready to fly your kite!

Escoge un buen momento para Volar Tu Cometa

Pregunta: ¿Porqué Daniel el travieso tuvo tantos problemas para "enseñar" a volar su cometa?

Respuesta: Como muchas otras personas que vuelan cometas por primera vez, Daniel cometió el error de correr con su cometa mientras trataba de hacer su lanzamiento. Este error es uno de los mas comunes en el vuelo de cometas. Esto es lo que hay que hacer:

Escoge un día cuando el viento sople establemente a velocidades entre cuatro y catorce millas por hora. El día que escojas puede ser cualquier día del año, siempre que no esté lloviendo o nevando y las condiciones del viento sean correctas.

Encuentra entonces un espacio abierto y Seguro, Espacios sin árboles, el tope de una colina, campos de juego, el campo y la playa son los mejores espacios para volar cometas. Trata de evitar peligros como cables, árboles, edificios altos y tráfico.

Colócate enfrente de tu cometa con la espalda hacia el viento. Con una mano mantén la cometa hacia el punto de remolque. Con la otra mano, mantén el riel de tu cuerda de vuelo. Cuando el viento empiece a empujar el frente de tu cometa, suelta un poco de la cuerda y empuja suavemente a medida que el viento eleva tu cometa en el aire. Gradualmente suelta mas cuerda dando un tirón cada vez que lo hagas. Pronto tu cometa estará remontándose en el cielo. Si empieza a bajar, hala la cuerda hasta que empiece a levantarse otra vez.

Después de un buen día de vuelo de cometa, querrás que la tuya tenga un buen aterrizaje. Para hacerlo, lo importante es que te tomes el tiempo suficiente. Enrolla la cuerda suavemente y en forma pareja. Es mas fácil si caminas hacia tu cometa mientras lo haces. Una vez que tu cometa ha regresado a la tierra, trátala con gentileza ... y podrás volarla una y otra vez.

DANIEL EL TRAVIESO

Daniel El Travieso® usado con permiso de Hank Ketcham y de Field Enterprises, Inc.

"TAMBIEN ESTARIAS CANSADA, SI HUBIERAS PASADO TODO EL DIA TRATANDO DE ENSEÑAR A UNA COMETA TONTA COMO VOLAR"

RESPUESTA:

el nombre de este famoso inventor as
Alexander Graham Bell

Pull-out Page

Del Arte al Zoologico Setiembre 1991
Noticias para las escuelas del Instituto Smithsonian

Famoso Inventor de Misterios: ¿Puedes Adivinar Quien Es?

El inventor que aparece en esta fotografía unió muchos triángulos cubiertos de seda para hacer cometas muy grandes. Estas cometas volaban tan establemente que él pensó que quizás podría construir un avión con un diseño similar. En 1907, levantó a un hombre en el aire 168 pies usando una cometa hecha con mas de ¡3000 triángulos pequeños!. Esta fotografía muestra al inventor con su nieto aterrizando una de las cometas gigantes.

Quizás conozcas a este fabricante de cometas como el inventor del fonógrafo y el telefono. ¿Puedes adivinar quién es?

La respuesta aparece al final de la pagina para separar.

Traducción de Teresa L. Mora

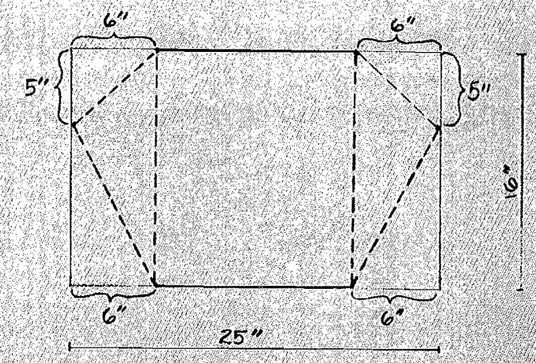

Figura A

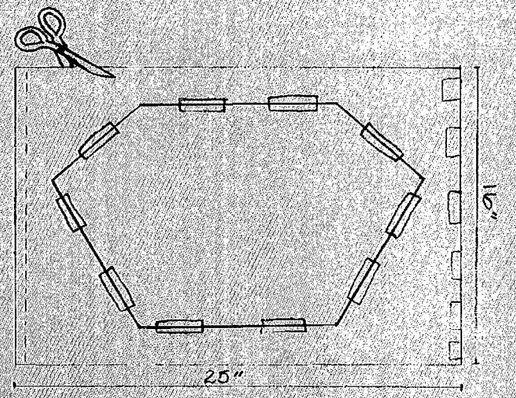

Figura B

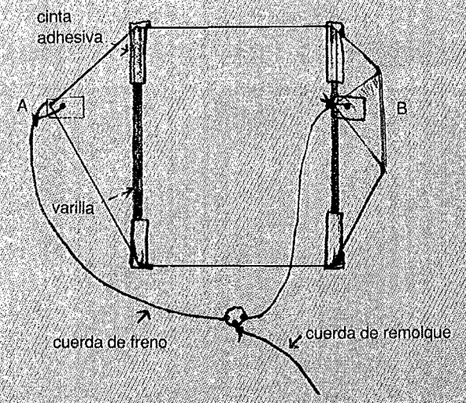

Figura C

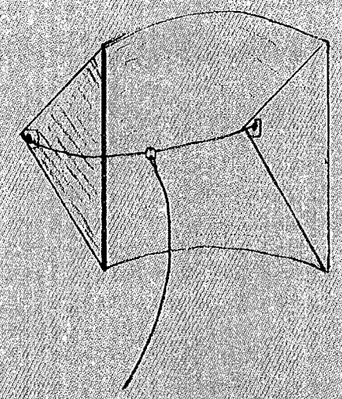

Figura D

Dibujos de Jan Majewski

¿Puede Volar Una Bolsa de Basura?

Transforma una en una cometa y descúbrelo, ¡realmente vuela!

Necesitarás:

- una bolsa plástica de basura de 24" x 30" o mas grande.
- dos varillas de madera de 1/4" de diametro y 16" de largo
- cuerda fuerte: 3 pies para la línea de freno; 60 yardas para la línea de vuelo
- un tubo de cartón de un rollo de toallas de papel
- un marcador rojo o amarillo
- una página completa de periodico
- una regla de madera
- cinta adhesiva de 1" o mas ancha

1. Con la ayuda do un amigo, haz un patrón para tu cometa. Extiende la hoja de periódico sobre una mesa o en el suelo. Usando tu regla y el marcador rojo o amarillo, dibuja sobre el periódico un rectángulo de 25" x 16". Luego mide 6" sobre ambos lados de 25" de tu rectángulo y coloca un punto grande en cade un a de las cuatro marcas. Ahora con tu regla, conecta cada punto del tope con cada uno de los puntos de abajo directamente dibujando una línea recta como se muestraen la *Figura A*.

Ahora mide 5" desde el tope de cada uno de los lados de 16" de tu rectángulo y coloca un gran punto en cada uno de estas dos marcas. Dibuja una línea recta desde cada uno de los dos puntos hasta las cuatro marcas sobre las líneas de 25" como se muestra en la *Figura A*.

Esto te dará el patrón terminado para tu cometa. Corta el patrón para hacer una forma de seis lados como se muestra en la *Figura B*.

2. Luego pega el lado abierto de la bolsa de basura. Coloca la bolsa en el piso o mesa y pega suavemente con la cinta adhesiva el patrón a la bolsa (ve la *Figura B*). Con tus tijeras corta ahora, a través de la cinta adhesiva, a todo lo largo del borde del patrón. A medida que cortes, recuerda que la bolsa tiene dos capas y debes cortar ambas con mucho cuidado para que la capa de abajo no se deslice. Cuando termines de cortar habrás hecho dos figuras de seis lados cada una. Cada una de estas figuras harán una cometa. Guarda una de las figuras plasticas para ti y dále la otra a tu amigo.

3. Amarra ahora las varillas de madera y la línea de freno a tu figura plástica para hacer una cometa. Coloca las varillas sobre la figura, desde el tope hasta abajo, como se muestra en la *Figura C*. Pega las varillas con pedazos de 4" de cinta adhesiva, como se muestra, pegando alrededor de 1" de la cinta sobre el extremo de la varilla y hacia atras de la cometa.

Entonces usando dos piezas más de 4" de cinta cubre los puntos "a" y "b" (como muestra la Figura C) tanto en el frente como en la parte de atrás de la cometa. Abre un hueco pequeño de 1/4" en el punto "a" y otro en el punto "b". Dobla ahora tu pedazo de cuerda de 3 pies exactamente en la mitad. Coloca tu dedo en el doblez y pídele a tu amigo que haga un nudo con la cuerda de freno alrededor de tu dedo. Quita tu dedo del nudo de manera de hacer un lazo en el centro de tu cuerda de freno. Este lazo es llamado el punto de remolque. Luego ata los dos extremos de la cuerda de freno a través de los huecos que hiciste cerca de los puntos "a" y "b" (como muestra la *Figura C*).

4. Finalmente, asegura uno de los lados de la cuerda de vuelo alrededor del rollo de papel de toalla. Enrolla toda la cuerda menos una yarda alrededor del tubo. Asegura el lado suelto de la cuerda de vuelo en el lado de remolque.

¡Ahora estás listo para volar tu cometa!