

Left, Space brings out imaginative artwork. Right, These students participated in all the activities during a unit on aerospace.

# Aerospace Activities in the Elementary School

seventeen classroom activities that are  
"right on"

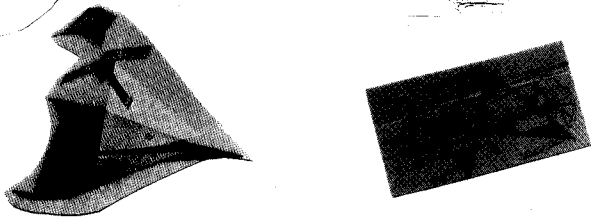
For as many years as man has flown, he has been vitally concerned with passing on the knowledge and exhilaration that this remarkable feat produces. During this century, the knowledge has grown by leaps and bounds, and the feelings, as Jonathan Livingston Seagull found out, are intense and immeasurable. Together, these elements—knowledge and feelings—have been combined into the interdisciplinary field of aerospace education.

Starting as a small movement in the twenties, these activities have been accelerated and intensified to the point where today many civilian government agencies, military branches, private companies, and educational institutions now publish or in some manner disseminate information and services dealing with aeronautics and space.

An interesting facet of the aerospace education movement is that no precise definition of what it really is has ever been developed. During the sixties while several inquiry-oriented curriculums were being developed, many educators tried to define what constituted aerospace education and how could it be taught, but somehow the task eluded us. The whole fertile

area seemed to contain too much to really pin down and put into usable form. Instead most of us who were working with the concept just flew paper airplanes, launched helium balloons, sent model rockets skyward, and to all outward appearances, just had a lot of fun while developing a large body of independent and interdisciplinary activities.

Times have changed and it appears that aerospace activities with their high intrinsic interest, broad base, and multidisciplinary applications are "right on" for the seventies. We know today that an activity approach using an aerospace theme really can produce intrinsic motivation to learn, integrate learning in meaningful patterns, foster true inquiry, and help open up the formal classroom. Originally reading, history, and art through the activities, and teachers felt that the most benefit probably came in the areas of cooperation, teamwork, and shared participation. In nearly all cases, everybody felt good about it. We have capsuled the activities and presented some starters that worked well for us. We've put them in the order that they were originally developed: however, they can be mixed or matched in endless ways. The secret is just to try one.



## Activity One—Feeling Air

Air can be felt. A good way to feel and study it is to set up an electric fan and place paper streamers on the fan guard with tape. Take time to warn about fingers and fans and then turn it on. Observe the streamers and if someone wants to try shorter and longer ones, then do it. If you have a three-speed fan, you have the basis for a whole lot of different observations.

## Activity Two—Seeing Air

Air is tough to see unless you place it in something other than more air. We put it in water. All you need is a large container (an aquarium works best because you can see in the sides) and some clear plastic glasses. Run water in the aquarium and give a child two glasses. The object is to trap air bubbles and then try to pour air from one glass to the other. It's fun. You can do it individually or in teams.

## Activity Three—Air Takes Up Space

It's fun to blow up paper sacks, plastic bags, and balloons with air. It's also fun to pop them and let the air out. Also get a soap bubble generator and produce millions of soap bubbles. There's air in every one of them. You can even color the air in a plastic bag by adding some yellow chalk dust.

## Activity Four—Air Has Weight

But not much. You need a very sensitive scale to weigh the air in a basketball. If you think you can, deflate a basketball and weigh it. Then blow it up and weigh it. The difference in weight, if you find any, should be a result of adding air. A better way is to blow up two large balloons to the same size and tie them to the end of an 18-inch dowel. When you get the balloons balanced, have someone puncture one with a pin. It's fun and somebody may notice which way the system shifts into imbalance.

## Activity Five—The Parachute

One of the great ones. You need a hexagon pattern at least 12 inches across. Get some plastic from the cleaners and cut out parachutes from the hexagon pattern. Borrow a gummed label from the office and bring some sewing thread. Cut up the label and stick six shroud lines onto the points of your parachute. Tie a knot in the lines and add a small weight. These nifty chutes can be thrown up or dropped. You can time them, try to land on spot, or do a hundred other things.

## Activity Six—The Kite

The best way to start here is with a commercial kite kit. They're easy to build and all you need is a little wind. Have a kite field day! Everybody flies a kite. You will be able to find some student in your school who builds kites. Have him come in and demonstrate his skills and explain why and how his kite flies. There are some terrific kite books for the older kids. If you have one, they'll read it.

## Activity Seven—Lighter-Than-Air Balloons

One of the all-time favorites which has had great and well-deserved popularity. You will need the largest balloons you can buy and somehow you must find some helium. Likely sources are the high school chemistry teacher, college chemistry department, or a welder's supply. Put out a plea for help and you can usually get someone to fill a balloon or two for you. To document your balloon flight, have the class fill out a post card which the finder can return with information and tie it up in a plastic sandwich bag for protection. Attach it to your helium-filled balloon and let it go. For best results, pick a calm day to launch. You can use language experiences with many of these activities, and this is one of the best. They'll write and write about where those balloons are going.

## Activity Eight—Paper Airplanes

If you can't do it, ask someone to fold you a paper airplane. Then teach all the kids in your class how to fold one if they don't already know. The best place to fly them is in a gym. You can even have a paper airplane contest. You can fly for distance, for time, for aerobatic maneuvers, or for accuracy. Make up your own rules. Find one of the books on paper airplanes; they're all good.

## Activity Nine—Balsa and Foam Gliders

These are available from stores for ten cents and up. They're more sophisticated than paper airplanes and can be flown outdoors. Most of them have control surfaces and the kids soon learn how to climb, stall, roll, and loop-the-loop. Better check the library for books on airplanes.



Above, a Ripley, Oklahoma, second grader captured on paper the excitement of a field trip to an airport. Below left, Countdown for kite launching with a new tailless bat kite. Below right, Catapult launching of a styrofoam glider is fun and challenging.



## Activity Ten—Propeller Aircraft

This generation is missing the "silk span and stick" experience that meant a lot to our crowd. However, there are rubber-band-powered aircraft available in much the same form as the balsa gliders. They are inexpensive, easy to assemble, and they come with landing gear. This adds a new dimension, and you can learn about take-offs and landings. Try to locate through a hobby shop some people who fly rubber-band or even gasoline-powered aircraft. They make fantastic resource persons, and they love to demonstrate their hobby.

## Activity Eleven—Field Trip to the Airport

The secret is to call the airport manager. He will schedule your field trip so you can see the most. You may even get to board an airplane! A good thing to watch for is the penny-a-pound rides given by flying groups. The kids will write books about their trip. Have a pilot come and visit before or after the trip to answer questions.

## Activity Twelve—Solar System Models

When aviation wears off, move right on out to space. One way to get into this is to study the solar system. You can

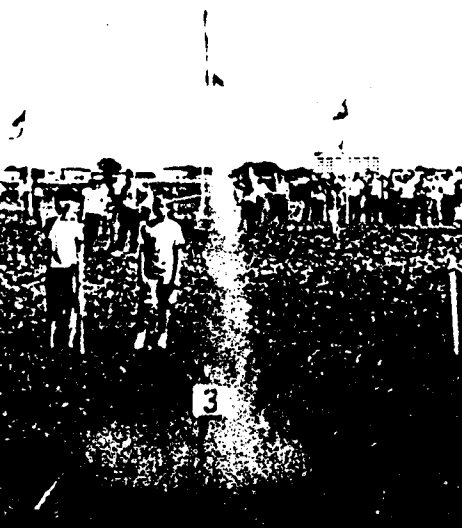
## Activity Fourteen—Recycled Rockets

Our garbage cans are full of raw materials for building great models of rockets and spacecraft. Aluminum beverage cans, plastic bleach bottles, coffee cups, hair spray caps, bottle tops, and other symmetrical containers work well. Epoxy cement will stick any of them together and, for realism, a little paint stripper and some steel wool will quickly clean up the beverage cans and leave you with beautiful, gleaming aluminum construction modules. Titans, Saturns, Redstones, Little Joes, Skylab, and vehicles of your own design are possible.

## Activity Fifteen—Model Rockets

Building a model rocket from a commercial kit requires only basic modeling skills. Almost any grade level or ability can participate. This is another activity where you can use student resource persons. Ask around and you can find some kids who are in to model rocketry. You should also order the free teacher materials from Estes Industries, Penrose, Colorado. If you decide to launch one or more rockets, recruit some high school or adult help. If you have a model rocket club in your area, solicit their assistance. In any case, stress

Left, A group of students launching model rockets at Johnson Space Center in Houston, but you can use any field for this activity. Center, the classic and exciting egg-loft activity doesn't always bring success; this plan didn't work. Right, Recycled beverage containers and some paint make excellent models of the Saturn V and Little Joe rockets, and help clean up the environment.



assign each planet to several students and have them research its properties. Models can be made and painted. Use balloons, styrofoam balls, or anything round that can be hung from your ceiling. Trap an art teacher into helping you make a solar system mobile with styrofoam balls, dowels, and string with map pins for moons. They're beautiful. *National Geographic* and the library should have all the information you need for the children's research. Another thing to do is to chart out a scale distance model of the solar system on the playground. If one child is the Sun and another is the Earth, one yard away, then poor old Pluto will be forty yards away!

## Activity Thirteen—Reaction Motors

The balloon is the safest rocket in the world and works the same way the Saturn V does. The long narrow balloons work well for some activities and round balloons for others. If you can find the "squealer" balloon with a heavier neck, you're lucky. Blow them up and fly them. Try to predict where they're going. After a while put up a string in the room and tape small sections of soda straws to blown-up balloons. Now you have a guidance system, and you can even whiz messages back and forth across the room.

safety. Model rocketry can be conducted as a school activity, but it should be conducted properly.

## Activity Sixteen—The Egg Astronaut

Another popular activity that has been utilized in many ways. For a very creative project see Alan McCormack's "Unidentified Flying Omelets" in the February, 1974, *Journal of Aerospace Education*. The basic activity involves placing a fresh egg in some type of container and dropping it from a ladder, the rooftop or even an airplane. Cans, milk cartons, balloons, parachutes, rubber, styrofoam, model rockets or almost anything else you can imagine have been used. This activity is good for team competition or individual fooling around.

## Activity Seventeen—Life in a Spacecraft

You can build a child-size spacecraft out of cardboard packing crates and outfit it with knots, lights, couches, space food, walky-talkies, and other gadgetry to help kids fantasize about space. If you want to get a little more precise, you can build a scale Apollo Command Module from sticks arranged in a tipi framework and covered with paper. It looks great. □