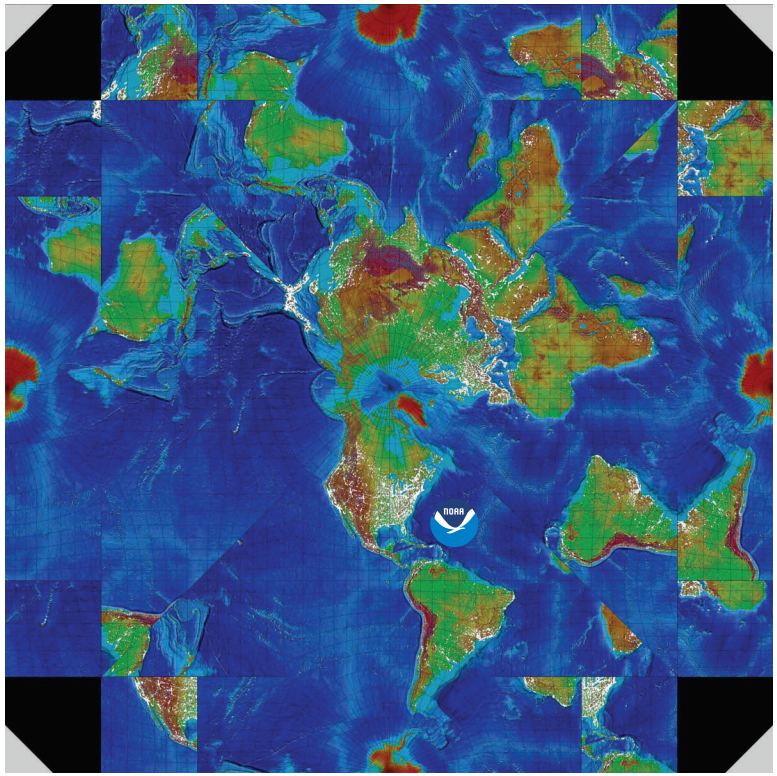
Earth Origami



Digital Global Image by Peter W. Slos, NOAA-NGDC

Carl Skalak was on a solo canoe trip in the Adirondack Mountains of upstate New York when a surprise storm brought three days of high winds and heavy rain that eventually turned to snow. When the weather cleared, the river was frozen over and he was surrounded by high drifts of heavy snow.

"I knew I couldn't get out on my own, and didn't know if that situation would change for the positive anytime soon."

Skalak activated a Personal Locator Beacon (PLB), which sent a distress message to NOAA's Search and Rescue Satellite Aid Tracking System (SARSAT). According to Lt. Daniel Karlson, SARSAT operations support officer for NOAA, "Mr. Skalak was facing a life-threatening situation because of his isolated conditions and the brutally frigid weather. In a matter of a few hours, he might have become acutely hypothermic putting his life at risk." The SARSAT distress signal was relayed to the Air Force Rescue Coordination Center at Langley Air Force Base, Va., which in turn notified the nearest rescue unit, the U.S. Army Fort Drum Air Ambulance Detachment near Watertown, N.Y. A few hours after activating his PLB, Mr. Skalak was rescued.

~ from NOAA News Online (Story 2124) at http://www.noaanews.noaa.gov/stories2003/s2124.htm

What You Will Do

Make a three-dimensional model of Earth

NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) operates a search and rescue system known as COSPAS-SARSAT, in cooperation with the U.S. Coast Guard, the U.S. Air Force, and the National Aeronautics and Space Administration. This system can detect emergency signals from Personal Locator Beacons anywhere in the world. Carl Skalak's PLB may have saved his life.

NESDIS uses satellites for many other purposes in addition to search and rescue, and gathers information about Earth's environment that includes the location of major fishing areas, hurricanes, tsunamis, earthquakes, fires, and volcanoes, as well as information about Earth's habitats, geology, and climate. NOAA makes this information available to many people for many different purposes. Here's one example of a special NESDIS product: satellite images of Earth, assembled so that the combined image can be folded to produce a three-dimensional object that is almost round.

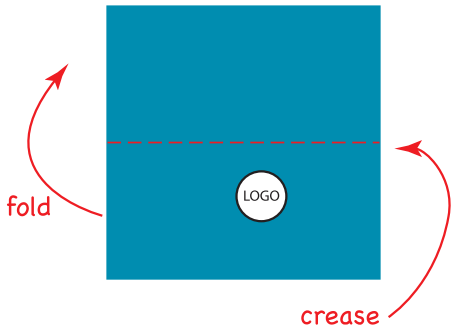
What You Will Need

- ❒ National Geophysical Data Center (NGDC) "Origami Balloon" image, copied on a color printer as large as you can make it. You can download a pdf file of this image (2.5 MB) from *http://www.ngdc.noaa.gov/mgg/image/origamiearth.pdf*
- ❒ Scissors

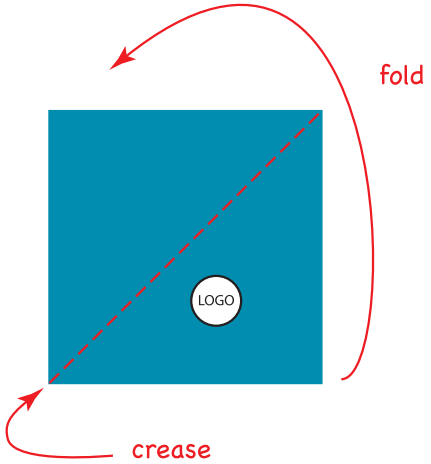
How to Do It

1. Cut the Origami Balloon image into a square.

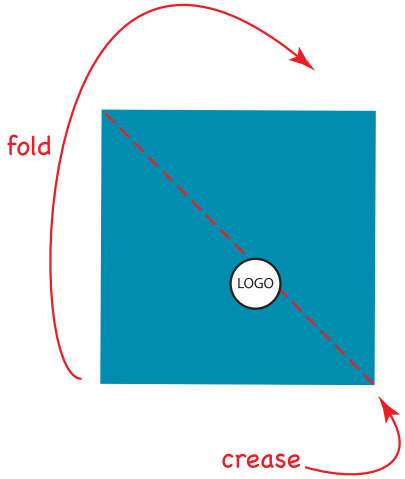
2. Put the square image face-up on a flat surface so that the NOAA logo is right-side-up. Fold the bottom edge to the top edge, and make a crease that passes through the center of the square. Now unfold and refold along the same crease so the image is facing out. This will make it easier to shape the model in later steps. Unfold the image so it is a square again.



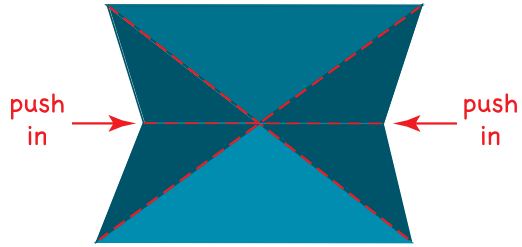
3. Bring one corner to the opposite corner and make a diagonal crease that passes through the center of the square. Unfold and refold along the same crease in the opposite direction. Unfold the image so it is a square again.



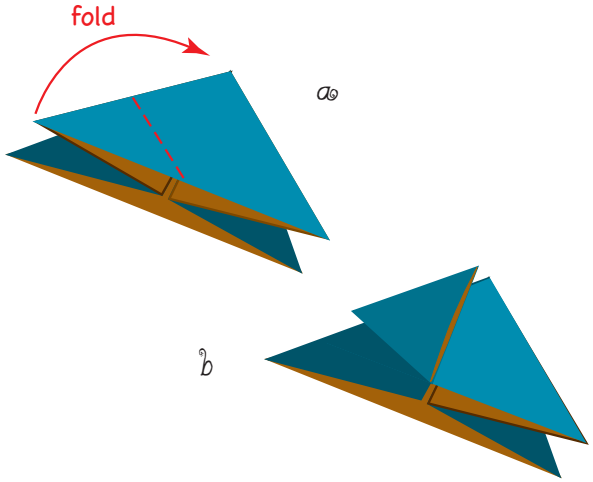
4. Fold the other corner to the opposite corner, and make another diagonal crease so that you now have three creases that cross in the center of the square. Unfold and refold along the same crease in the opposite direction. Unfold the image so it is a square again.

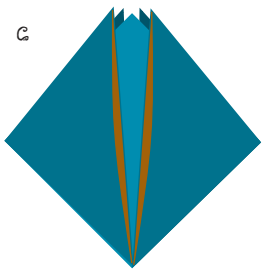


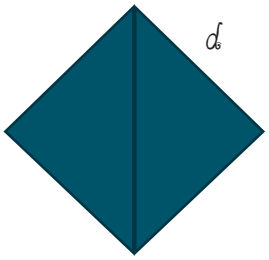
5. Put your thumbs on the ends of the horizontal crease formed in Step 2. Push the sides of the square together, and flatten into a triangle. The longest side of the triangle should be closest to you.



6. Notice that there are two pieces at each of the side corners of the triangle, one on top of the other. Take the upper piece at one of the side corners (a), bring it to the top of the triangle, and make a crease (b). Repeat with the upper piece of the other side corner.

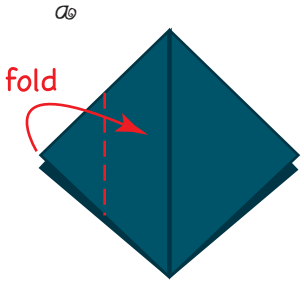






7. Turn the model over, and repeat Step 6.

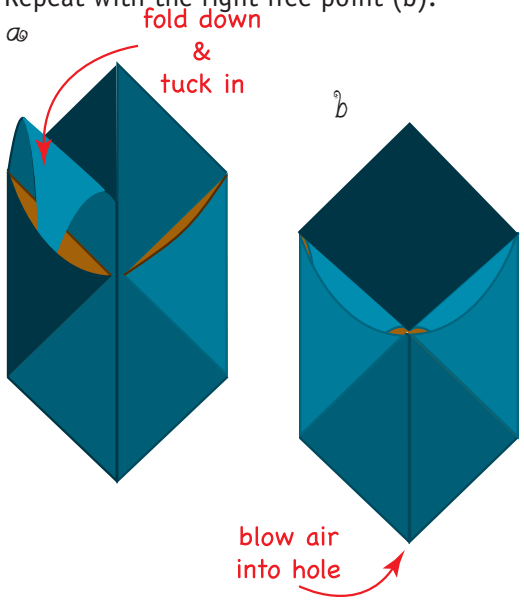
8. Now there are two pieces at each of the side corners, one on top of the other. Fold the upper piece on one side to the center and make a vertical crease (a). Repeat with the upper piece of the other side (b).



Origami illustrations courtesy Mel Goodwin

9. Turn the model over, and repeat Step 8.

10. Notice that there are two free points at the top of the model. If you turn the model over, there are two more free points at the top. Fold down the left free point at the top of the model (a). Open up the pocket on the left, and tuck the point into the pocket. Repeat with the right free point (b).



11. Turn the model over, and repeat Step 10.

12. Open up the shape and find the open end at the bottom of the model.

13. Hold the model lightly by the edges, and blow sharply into the hole. The Earth Origami Balloon will inflate!

Want to Do More?

1. See *http://www.ngdc.noaa.gov/education/education.html for lots of* other images, maps, and activities.

2. Visit *http://www.magazine.noaa.gov/stories/mag96.htm* for more information about COSPAS/SARSAT and Personal Locator Beacons.

An artist's conception of a fully integrated environmental monitoring system including satellites, balloons, ships, aircraft, buoys, and data reception and processing facilities.Courtesy NOAA.