

Roto-Copter

This simple paper toy spins through the air like a mini-helicopter

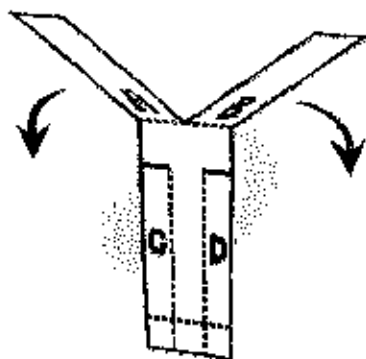


What do I need?

- print-out of the Roto-Copter pattern which you can click-on in Step 1
- pencil
- scissors
- paper clips
- crayons or markers
- newspaper
- cereal bowl

What do I do?

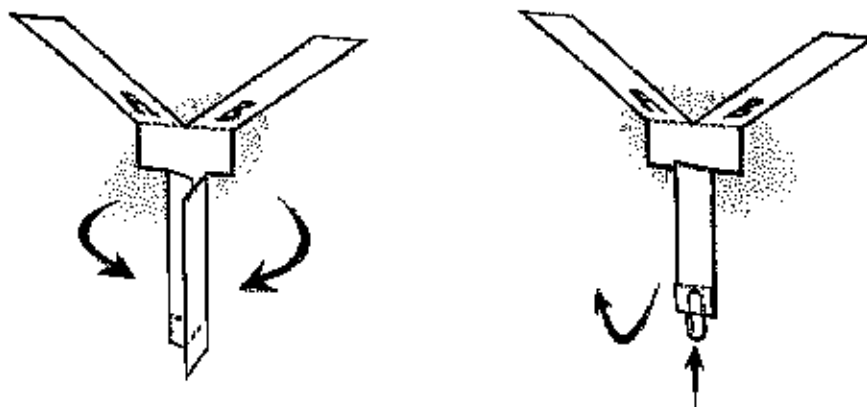
1 Print out the Roto-Copter pattern. Click [here](#) to go to pattern page. Cut along the solid lines only. Fold on the dotted lines.



2 Fold A toward you. Fold B away from you.

3 Fold C and D over each other so they overlap.

4 Fold the bottom up and put a paper clip on it.



5 Hold the Roto-Copter by the paper clip. Throw it like a baseball, as high and far as you can. It will spin to the floor. You can also stand on a chair or on the stairs and drop it. Ask a grown-up if you can drop it out the window.

6 If you want, you can use crayons or markers to color your Roto-Copter before you fold it. The colors will blur together when it spins.

ROTO-TARGET

Make three Roto-Copters for each person. Use a marker to draw a 1-foot circle on a piece of newspaper. Put a cereal bowl in the middle of the circle. The circle is the target area and the bowl is the bull's-eye. Take turns standing on a chair at the edge of the newspaper and dropping your Roto-Copters. At the Exploratorium, we get 3 points for a bull's-eye, 2 points for a copter inside the circle, and one point for just hitting the newspaper-but you can make up any rules you want.

Wow! I Didn't Know That!

Igor Sikorsky designed the first

What's Going On?

Why does the Roto-Copter spin?

When the Roto-Copter falls, air pushes up against the blades, bending them up just a little. When air pushes upward on the slanted blade, some of that thrust becomes a sideways, or horizontal, push.

Why doesn't the copter simply move sideways through the air? That's because there are two blades, each getting the same push, but in opposite directions.

successful helicopter in the late 1930s. His inspiration came from drawings of an aircraft with a spinning wing, drawn by Leonardo da Vinci nearly five hundred years before.

Places to Visit

[Igor I. Sikorsky Historical Archives](#) -Lots of photographs and information about helicopters and the man who invented them.

[Leonardo da Vinci Museum](#) -This online gallery displays images and other information related to Leonardo da Vinci. The "[West Wing](#)" of the gallery has images of helicopters and other flying machines.

This and dozens of other cool activities are included in the Exploratorium's Science Explorer books, available for purchase from our [online store](#).

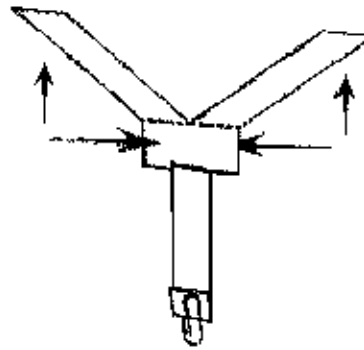
We would like to hear about your results and discoveries. Please send an email message to [Ken Finn](#).

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The two opposing thrusts work together to cause the toy to spin.



Next time you drop your copter, notice which direction it spins as it falls. Is it clockwise or counterclockwise? Now bend the blades in opposite directions-if blade A was bent toward you and blade B was bent away, bend B toward you and A away. Drop the copter again. Now which way does it spin?

In the Spinning Blimp, air pushes up on the flat sides of the strip of paper. When the flat side of the paper strip is parallel to the ground, the blimp drifts down like a flat piece of paper. But if the blimp tilts so that the flat side of the strip is at an angle to the ground, the paper strip gets a sideways push, just like the blade of the copter, sending the blimp spinning. Each time the flat strip comes around, it gets another push and goes for another spin.