

# CURIOSITY AT HOME

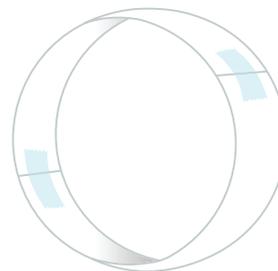
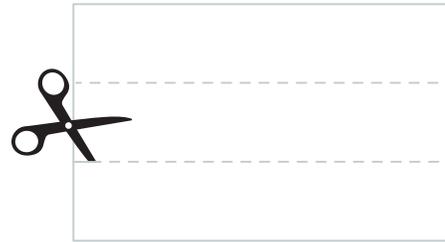
## TAKE FLIGHT



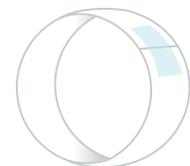
*Most of us have probably made a paper airplane at some point, but have you ever made one that uses hoops instead of wings? Follow the directions below to make a flying contraption, then create and test your own design using paper and other materials!*

### MATERIALS

- Drinking straws (1 per flyer)
- 3" x 5" index cards (1 per flyer)
- Tape
- Scissors
- Paper (of a variety of sizes)
- Paper clips
- Target or hula hoop
- (Optional) Tape measure or other measuring device
- (Optional) Other building materials such as crafting supplies or recyclables
- Science notebook or paper
- Something to write with



2 strip of papers

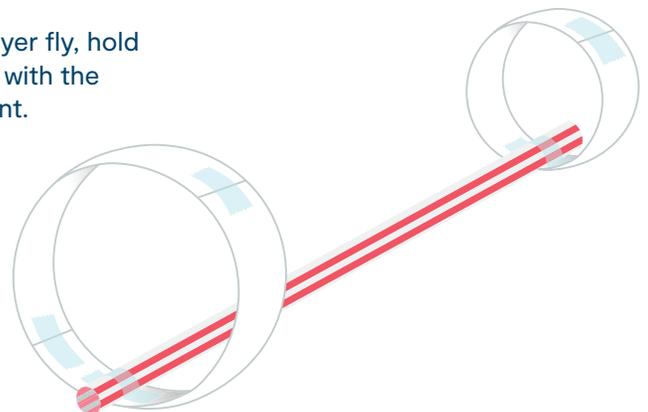


1 strip of paper

### PROCEDURE

#### To make a hoop flyer:

- Cut an index card the long way into three 1-inch strips.
- Curl one strip into a hoop and tape the ends together on both sides.
- Lay the other two strips end-to-end, to make one long strip. Tape them together to make one large hoop.
- Tape each hoop to one end of the straw. To make your hoop flyer fly, hold the middle section of the straw and throw it forward. Try flying with the small hoop in the front and again with the large hoop in the front. Which had the better flight?



*Experiment continued on next page...*



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### PROCEDURE – CONTINUED

#### Test out your flyer:

- Distance Test: Find a long open space and throw your flyer. Using a tape measure, see how far it went. Record the distance in your science notebook and test again. It's good to do at least three trials to get a sense of how far your flyer typically goes.
- Target Test: Prop up a hula hoop or something that can be used as a target (you could use a stuffed animal, pillow, or draw a target on a piece of paper). Choose a short distance to throw the flyer from towards your target. If you hit the target, increase the distance until you cannot hit the target successfully anymore. How far away were you able to still successfully hit the target? Be sure to log that distance in your science notebook!
- Design another test for your flyer. How high can your plane go? Can it turn to the left or right? What if you race your hoop flyer against a paper airplane?

### EXPLORE MORE

There are lots of ways you can adjust this activity to change the difficulty level of your tests, including:

- Instead of circular hoops, what would happen if you folded the hoops on the hoop flyer to be triangle or square shaped? What if you increased or decreased the number of hoops?
- What's the largest paper airplane that you can create that still flies? What about the smallest?
- Can you set up an obstacle course for a paper airplane? Can you set up a course that allows your plane to stop and land in a specific area? Use hoops, targets or other objects for your plane to fly through or land on.
- Challenge others to compete for distance, accuracy or navigating through the obstacle course!

### DID YOU KNOW?

Wings lift planes due to their unique shape that allows for air to move faster over the top of the wing. The faster the air, the lower pressure that air will be. Since the air above the wing will have less pressure than the air below the wing, that wing creates lift, and the airplane goes up.

*Experiment continued on next page...*



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### 3–5 EXPLORATION

- What do you think would happen if you changed the angle of the wings or hoops of your flyer? Make a prediction and test it out.
- What might happen if you changed the weight of your plane? Try adding paper clips or removing a part!
- Think about the shape of a particular design of plane, or find a picture of one. What would you need to do to create a paper airplane inspired by this design? What makes this particular design successful?
- Is there a way in which you could combine two plane designs together to make a completely new design? Try it out and test your new design.



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