

# Poinsettia Spinner

Use a straw, scissors, and paper to engineer a small poinsettia-shaped propeller. Then, design a device that will allow you to power your poinsettia spinner using only air from your lungs! Learn about the importance of blade angles and thrust as you explore the work of propulsion engineers.

## TEKS:

SCI 3.6 A: The student is expected to explore different forms of energy, including mechanical, light, sound, and thermal in everyday life.

SCI 5.6 A: The student is expected to explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy.

SCI 5.6 D: The student is expected to design a simple experimental investigation that tests the effect of force on an object.

## Materials:

- Bendable straw (biodegradable)
- Clear tape
- Hole puncher
- Modeling clay (small piece)
- Poinsettia Spinner Template, printed on red cardstock\*
- Poinsettia Spinner Template, printed on green cardstock\*
- Scissors
- Wooden skewer

\*Template can alternatively be printed on white cardstock and colored green or red with markers, crayons, or colored pencils.

## How To:

*Part 1: Making a poinsettia-shaped propeller*

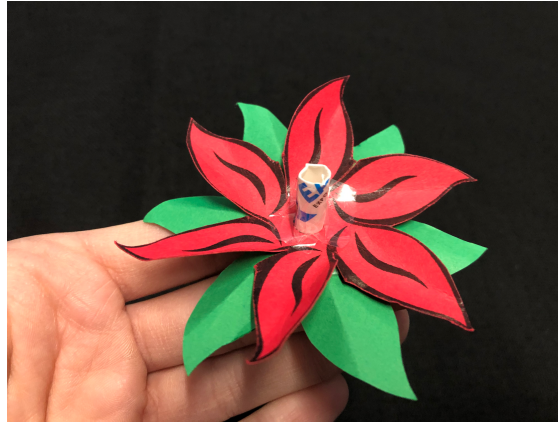
1. Cut a 1-inch piece off the long end of your bendable straw.
2. Cut out both the red and green poinsettia spinner templates.

**31 Days of STEM FUN!**

[www.destember.org](http://www.destember.org) | [#deSTEMber](https://twitter.com/deSTEMber) | © 2019 by Girlstart [www.girlstart.org](http://www.girlstart.org)

DeSTEMber is a trademark of Girlstart

3. Gently fold each leaf of the red and green poinsettia templates in half to provide them with some dimension, and slightly angle each leaf in the same direction.
4. Punch a hole in the center of both the red and green templates.
5. Use clear tape to secure the red and green templates together, back to back, making sure the center holes line up.
6. Place the 1-inch piece of straw through the center of your poinsettia and use tape to hold in place securely, making sure the center of the straw is open.



#### Part 2: Creating the poinsettia propelling device

1. Use clear tape to close and seal the bent end of the bendable straw so that no air can pass through.
2. Poke the wooden skewer through the short end of the bendy straw, about 1/2-inch from the taped end. Leave about 1 inch of the pointed tip of the skewer poking through other side of the straw.  
**Safety: An adult should assist when poking the skewer through the straw.**
3. Use a hole puncher to create a small hole in the short end of the bendy straw, about 1/2-inch from the skewer and 1 inch from the sealed end (Tip: pinch the straw in half and punch out a half circle on the flat straw). Make sure the hole is facing up towards the long end of the skewer.



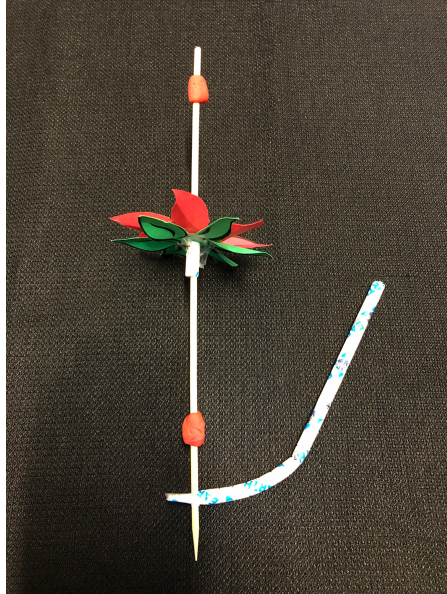
4. Wrap a small piece of modeling clay around the longer end of the skewer, about 1 inch up from the straw.
5. Place your poinsettia propeller onto the skewer with the red leaf side facing up.

**31 Days of STEM FUN!**

[www.destember.org](http://www.destember.org) | [#deSTEMber](https://twitter.com/deSTEMber) | © 2019 by Girlstart [www.girlstart.org](http://www.girlstart.org)

DeSTEMber is a trademark of Girlstart

6. Wrap another small piece of modeling clay around the top part of the skewer, about 1 inch away from the end farthest from the straw so that your poinsettia is blocked from sliding off the skewer in both directions.
7. Now, position your straw so that the hole is facing up towards the poinsettia. Holding the skewer below the straw, blow into the long end of the straw and watch the poinsettia spin and lift into the air!
8. Adjust the angles of the green and red leaves to see how fast you can make your poinsettia spin.



### STEM Explanation:

Propellers are machines that are able to push through fluids and air. Fans use propellers to blow air, airplanes use propellers to move through air, and boats use propellers to move through water! Propellers are constructed from multiple twisted blades poking out at angles from a central hub, and these blades are spun around in a circle by force from an engine or motor. Engineers design propellers that work as efficiently as possible by changing their power source, blade angles, and spinning motions. The force that results from a propeller spinning through the air is called thrust. In the poinsettia spinner, the leaves acted as the blades of the propeller and air from your lungs acted as the force moving your poinsettia. This force caused the leaves to spin and the thrust created from the spinning caused the poinsettia to lift into the air!

### Career Connection:

*Propulsion engineers* design, construct, and test structures like propellers that drive and push through fluids and air. They are a specific type of mechanical engineer that studies the force and dynamics of powering structures to move through different fluid mediums. Propulsion is used to power many forms of transportation like airplanes, cruise ships, rockets, and helicopters.

### Resources:

<http://www.arvindguptatoys.com/toys/Floatingcardpropeller.html>

<https://www.explainthatstuff.com/how-propellers-work.html>

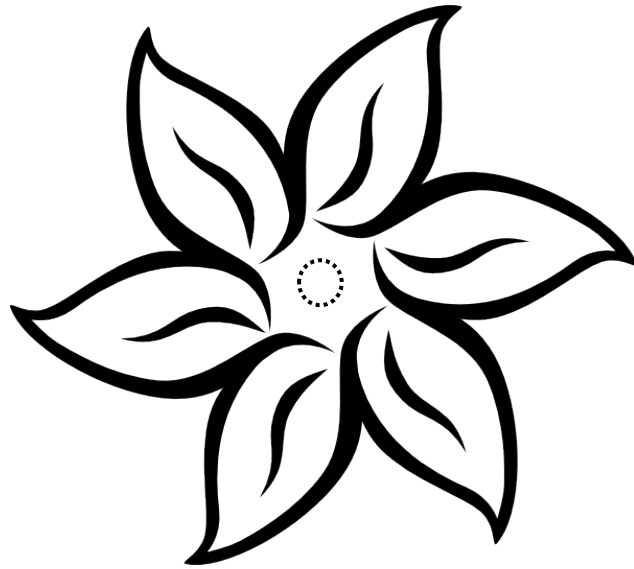
<https://howthingsfly.si.edu/propulsion/propellers>

**31 Days of STEM FUN!**

[www.destember.org](http://www.destember.org) | #deSTEMber | © 2019 by Girlstart [www.girlstart.org](http://www.girlstart.org)

DeSTEMber is a trademark of Girlstart

Poinsettia Spinner Template:



**31** Days of **STEM FUN!**

[www.destember.org](http://www.destember.org) | [#deSTEMber](https://twitter.com/deSTEMber) | © 2019 by Girlstart [www.girlstart.org](http://www.girlstart.org)

DeSTEMber is a trademark of Girlstart