

Galaxy Pinwheel: Teacher Guide

Content Area: Galaxies

NGSS Performance Expectation:

MS-ESS1-2: Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

Recommended Grade Level: Grades 6 and up

Learning Outcomes:

Students will be able to

- Identify the shape and features of spiral galaxies, including the arms.
- Model the rotation of spiral galaxies as gravity holds stars, gas, and matter together.

Lesson Duration:

- **Activity 1:** Galaxy Pinwheel (15 minutes)

Keywords: Gravity, spiral, galaxy

Activity Notes:

- This activity is Inspired by the [NASA Space Place Pinwheel Galaxy Pinwheel](#)
- This pinwheel features a Gemini image from 2005 of [NGC 6946 Fireworks Galaxy](#) . This is a spiral galaxy, as evident by its winding arms formed by dense regions of stars, gas, and dust. The stars within these arms are bound by gravity to orbit the galaxy's center.

Activity 1: Galaxy Pinwheel

Students will create a model of a spiral galaxy in the form of a pinwheel craft.

Materials

- Pinwheel Galaxy printout (1 per student)
- Pipe cleaner cut in half- Approximately 3 inches (1 per Student)
- Straw cut into a 1 inch section (1 per Student)
- Popsicle stick or chopstick (1 per student)
- Scissors
- Single hole punch
- Optional: tape

Activity Instructions

1. Distribute the Pinwheel Galaxy printouts along with a straw, a pipe cleaner, and a popsicle stick.
2. Instruct students to use their scissors to cut out the hexagonal shape on the printout and then cut along the inner white lines.
3. Use the hole punch on the six white dots around the edge and on the dot in the center. (Tip: fold the hexagon in half to help reach the center.)

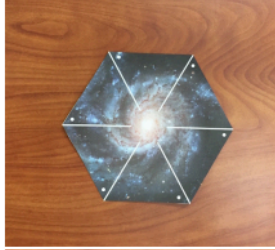
4. Turn the paper face down. Thread the straw through the center hole.
5. Going around the hexagon, fold each triangular flap so the pipe cleaner can go through each corner's hole. (Tip: Use tape along the paper edges to secure the edges to the center.)
6. Thread the pipe cleaner through the straw in the front of the pinwheel. Fold the pipe cleaner over the end of the straw to secure it in place.
7. Wrap the back end of the pipe cleaner around the popsicle stick. Don't wrap it too tight, or it won't be able to spin.
8. Spin the galaxy pinwheel! Ask students to identify features in the spiral galaxy and describe its rotation.

"Fireworks Galaxy" NGC6946 Legacy Image
International Gemini Observatory

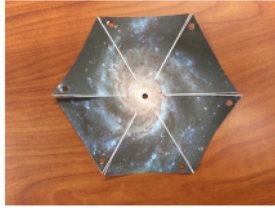


Credit: International Gemini Observatory/Travis Rector, University
of Alaska Anchorage

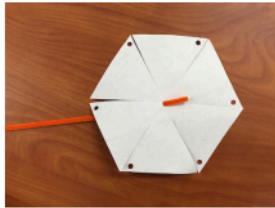
1. Cut out the hexagonal shape for your galaxy pinwheel.



2. Cut along the white lines.



3. Punch holes in the white dots: six around the edges and one in the center. You may have to fold the hexagon over to reach the center.



4. Turn the paper so it's face-down and thread the pipe cleaner through the center hole.



5. Going around the circle, fold each flap so the pipe cleaner goes through the hole.



6. Tie a knot in the pipe cleaner to secure the front of the pinwheel.



7. Wrap the other side of the pipe cleaner around a popsicle stick. Don't make it too tight, or it won't be able to move.



8. Blow on it and watch the galaxy spin!

