

## Solar System

In this activity, students will predict the scale of our solar system and the distance between planets, then check their answers using fractions.

### Directions:

For this activity, you will need two strips of accounting paper, a pen/pencil, and markers/colored pencils.

First, we will predict the distance between the planets using one of the strips of paper.

- On the left hand end of the paper strip, draw and label the Sun.
- On the right hand end of the paper strip, draw and label the Kuiper Belt.
- In order (moving away from the Sun), draw each planet based on what you think it looks like and where it is located in the solar system.

Now we will learn the true distance between the planets and compare them to your predictions. You will need your second strip of paper for this part.

- Fold the paper strip in half and label the fold Uranus.
- Fold the Sun end of the paper strip to the Uranus mark. Label the fold Saturn.
- Fold the Kuiper belt end of the paper to the Uranus mark. Label the fold Neptune.
- Fold the Sun end of the paper to the Saturn mark. Label the fold Jupiter.
- Fold the Sun end of the paper to the Jupiter mark. Label the fold asteroid belt.
- Fold the Sun end of the paper to the asteroid belt mark. Label the fold Mars.

You can put your two strips of paper side-by-side to see if your prediction matches reality. Are you surprised by the large distances between some of the planets?

## Constellations Activity

In this activity, students will learn more about the star patterns that form constellations.

### Directions

For this activity, you will need a cardboard tube, your page with the constellations on it, black construction paper, scissors, toothpicks, rubber bands, and a light source such as a lamp or flashlight.

Have you ever gone outside at night and looked at the stars? Have you ever tried tracing shapes with the stars you see? What can constellations help people with? Throughout history, people have used the constellations to navigate on Earth and tell time.

Cut out your constellation circles along the dotted lines. Using your toothpick, poke holes in the constellation circle at the locations of the black dots. These represent the locations of the stars. Now trace one of your constellation circles on the black construction paper and cut it out. Attach one of the constellation circles to one end of your cardboard tube with a rubber band. Poke a small hole in the center of the black circle and attach the paper to the other end of the cardboard tube with another rubber band. Look for a light source (desk lamp, flashlight, phone light, etc) and shine a light through the black construction paper hole. The light source should shine down the cardboard tube and illuminate the constellation source on the wall. You can repeat the above exercise, but this time you can create your own constellation on one of the blank circle templates.

If you want to learn more about constellations and how different cultures around the world classify the patterns they see in the sky, you can download a computer program called Stellarium: <http://stellarium.org/>.

## Galaxies Activity

In this activity, students will learn more about how astronomers classify galaxies into groups.

### Directions

For this activity, you will need your pages with the galaxy pictures, scissors, glue stick, and the page with the blank diagram on it.

First, we will imagine our own way to classify galaxies based on shared characteristics. Cut out the pictures of the galaxies. Then, arrange the galaxies into groups. Some questions you may think about to determine your galaxy groups could be 'Which galaxies have similar shapes?', 'Which galaxies have similar color?', or 'Which galaxies have similar sizes?'.

Second, we will learn more about how astronomers classify galaxies using what is called the 'Hubble tuning fork diagram'. The page you have with the blank diagram on it is the tuning fork diagram. Take a look at the diagram. The three branches on the diagram are for elliptical galaxies, spiral galaxies without bars, and spiral galaxies with bars. You can read more about the Hubble tuning fork diagram here: <https://sci.esa.int/web/hubble/-/52791-the-hubble-tuning-fork---classification-of-galaxies>. Using your glue stick, glue the galaxies onto the tuning fork diagram as demonstrated in the answer key. Some galaxies are difficult to put in the context of the tuning fork diagram such as 'irregular galaxies'.

# Answer Key



