

Galaxies

How are galaxies formed and what do they consist of?

MATERIALS



- ❖ Water Bottles
- ❖ Red paint
- ❖ Blue paint
- ❖ Glitter
- ❖ Water
- ❖ Funnel
- ❖ Straw
- ❖ Cotton balls

Do the Experiment!

1. Take a clear container and fill it 1/3 of the way with water.
2. Add 5 drops of paint in the water. Take a straw and mix the water and paint until there are no paint droplets left.
3. Take the funnel and put it in the container. Pour a little bit of glitter into the funnel so that it goes into the container.
4. Take cotton balls and pull them apart. Put them into the container and use straws to push the cotton to the bottom of the container. Continue to put the cotton into the container until the bottom is mostly filled with cotton.
5. Repeat steps 1 through 4 two more times. Make sure to leave a little bit of space at the top of the bottle without any water in order to be able to shake the container. Make sure you alternate red and blue paint.
6. When you are finished, make sure to put the cap on tight. Shake the bottle to see all the colors and glitter mix together!

DID YOU KNOW...

Scientists think there are over one hundred billion galaxies in our universe. However, the universe is so big that we will never know the actual number. The size of these galaxies range from 10 million stars to more than a trillion stars. Our galaxy, the Milky Way, has about 400 billion stars which is tiny compared to the largest galaxy, IC 1101, with an estimated 100 trillion stars! There are three main types of galaxies. The first type is a spiral galaxy. This type of galaxy, pictured below and to the left, looks like a spiral with long “arms” swirling out and around the center. The spiral galaxy is thought to be one of the younger types of galaxy. It is a common theory that spiral galaxies eventually turn into another type known as an elliptical galaxy. This happens when the spiral galaxies lose their gas and dust over time making it hard for new stars to form. Eventually, the spiral galaxies lose their “arms” and slowly turn into an elliptical shape forming an elliptical galaxy. The center picture is an elliptical galaxy. The last type is the irregular galaxy. This galaxy, pictured below and to the right, has no specific pattern. They tend to be small galaxies filled with gas and dust—this often allows for robust star formation. Irregular galaxies often start as another type of galaxy, but because of gravitational interactions, galaxy mergers or distortion and loss they become shapeless and patchy.



CHALLENGE

1. What do the different colors, glitter, and cotton balls in the container represent?
2. Are there different types of galaxies? If so, what are the main three and what kind do we live in?
3. What would happen to everything in a galaxy if gravity were to disappear?

STEAM Challenge: The smallest galaxy, M60-UCD1, has a diameter of 300 light years. The Milky Way galaxy, where we live, has a diameter of 120, 000 light years. Scientists like to use light years instead of miles since the galaxies are so big. How much bigger is the Milky Way than the galaxy M60-UCD1 in light years? If 1 light year equals 6 trillion miles, how much bigger is the Milky Way in miles? How would you write that number in miles?