



EXPLORING THE UNIVERSE

Nebula Spin Art

Try this!



1 Place a black paper circle in the bottom of the spinner and choose at least 3 colors of paint. Squirt 5–10 drops of each color *into the center* of the paper circle so that all the drops are touching.



2 Before spinning, lift up the spinner and tilt it back and forth to start spreading the paint equally in all directions. (This will be your star with its mix of elements!)



3 Cover the spinner with the lid and use the hand pump to spin everything for several seconds. Open it up and look inside. What happened to your star? Where did the star's elements go as it became a nebula?

Now try this! Can you make another nebula with a different pattern or color mixture? Use a gel pen to add the name of your nebula or your own name to the paper.

A nebula is a large cloud of gas and dust in space that can be created by a dying star.

Nebulas are responsible for mixing up and spreading out elements in space. In this activity, the spreading paint represents a dying star ejecting its matter into space. Out in the universe, a dying star pushes out gas and dust, forming rays, rings, and other features of nebulas just like the ones you can make with the paint. Some giant stars, much larger than the Sun, die with a violent explosion called a *supernova*. But many stars slowly shed their contents into space to form *planetary nebulas*. Planetary nebulas aren't actually planets, but these fuzzy objects resembled planets through old telescopes. Many nebulas are round, but strange shapes are also possible depending on what's nearby the dying star. No matter the final shape, the messy process of creating a nebula stirs up elements in nearby space—just like mixing paint colors in the spinner. Elements from stars that died a long time ago spread throughout space and contributed matter to the solar system, Earth, and even us. The oxygen you breathe, the calcium in your bones, and the precious metals in jewelry are all elements that came from dying stars!



An image of the Clown Face Nebula shows rays and rings similar to your spin art creation.

NASA scientists can assign colors in nebula images to represent different elements and other characteristics we can't see with our eyes. In this activity, you've made an artistic representation or model of a nebula. Objects in space emit light over the full



Like many nebula images, this representational color image of the Cat's Eye Nebula combines data from multiple telescopes.

electromagnetic spectrum—not just the colors we can see. Often, images captured by space telescopes include types of energy beyond visible light, such as X-rays, infrared, and ultraviolet light. Scientists translate these types of energy into visible colors in the final images to share more information. For example, scientists used NASA's Chandra X-ray Observatory to observe the area around the central collapsed star in the Cat's Eye Nebula and discovered a hot cloud of gas emitting X-rays. Because X-rays are invisible to our eyes, scientists used blue to represent them in this image. Scientists also use colors to represent the unique mix of elements in each nebula. For example, red usually indicates hydrogen gas.