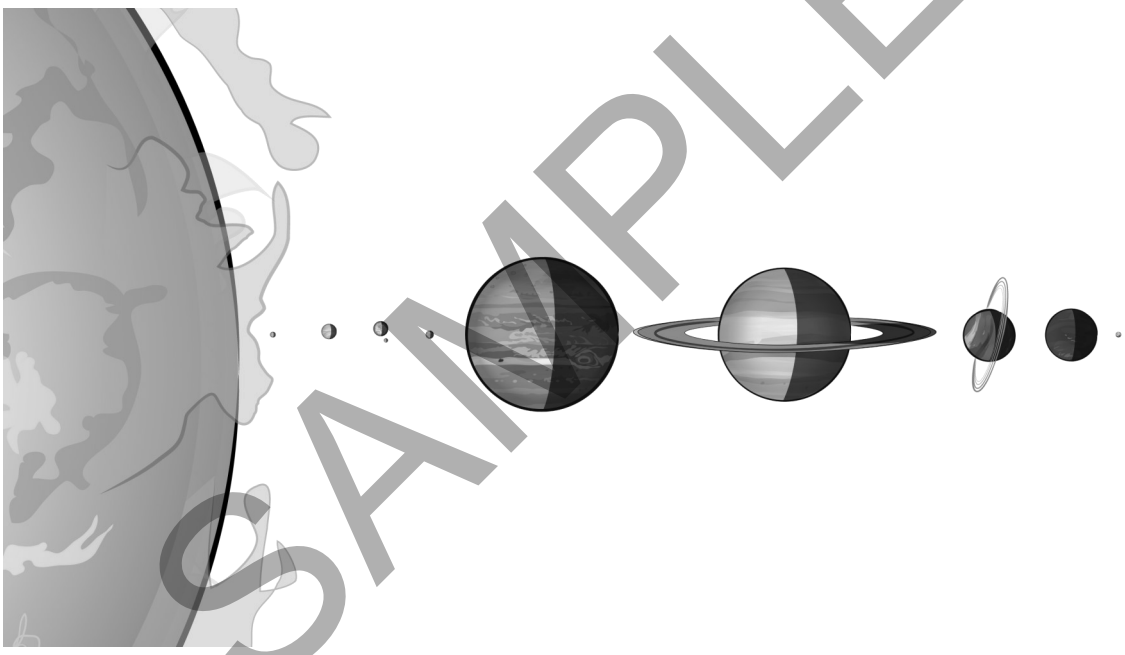
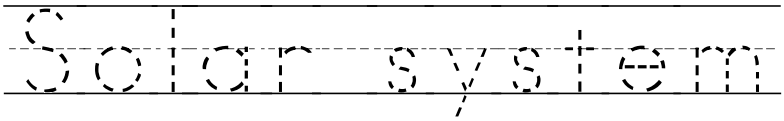
The Solar System: Planets, Earth's Moon, and Constellations

Think about your home where you live. Picture your neighbors or the area close by your house. Now imagine you could see your home from higher, like a bird's eye view. Now you can see your home and neighbors and your town. If you go even higher, maybe in an airplane, you can see your town and the towns and cities close by. If you went even higher, maybe in a space shuttle, you could see whole countries and even continents.

That's what we're going to do now to get a big picture of what our universe looks like, only you'll have to use your imagination because there's no one spot a human being can stand or fly to that lets them see the entire universe.

We live on planet Earth. Earth's neighborhood is made up of our sun, planets, their moons, dwarf planets, asteroids, and comets.

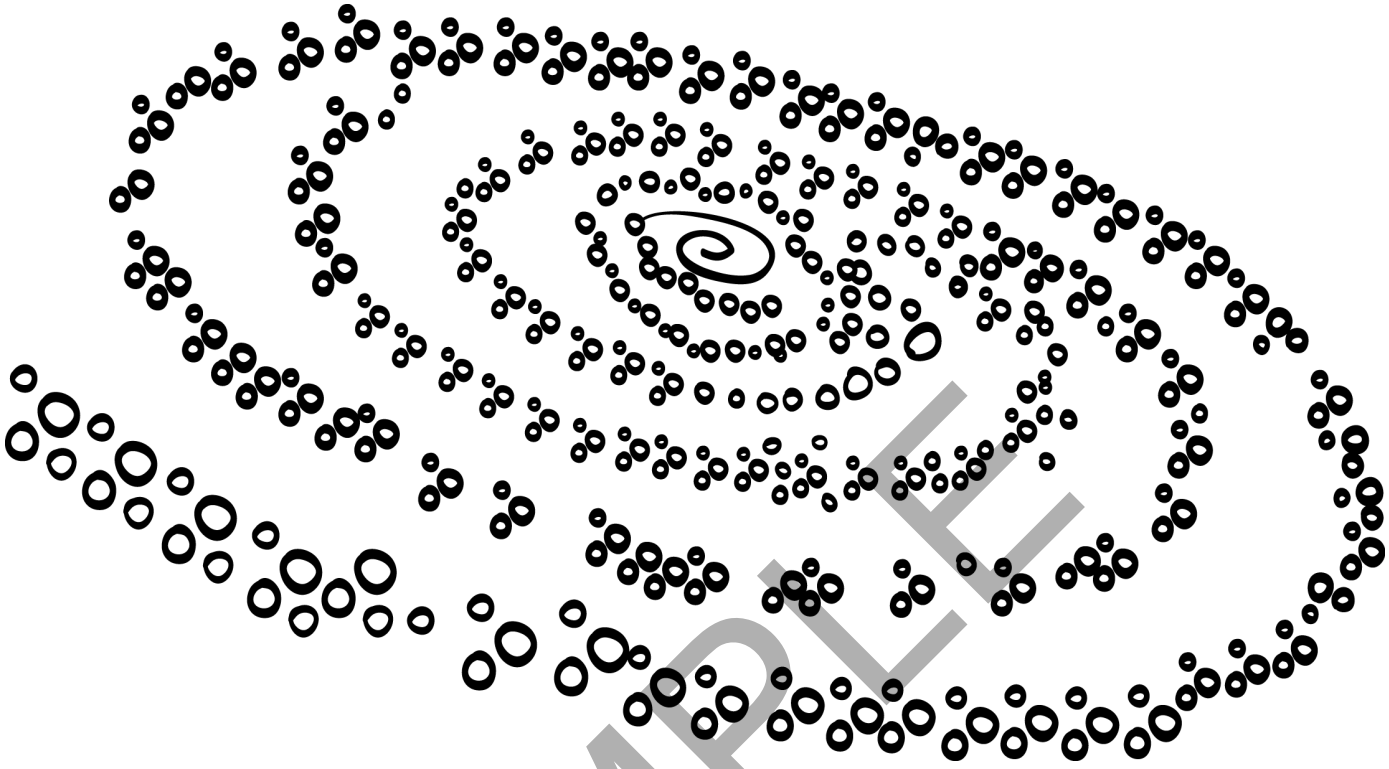




SAMPLE

If we back up further, we would see that our **solar system** is part of a larger system called a galaxy. Scientists classify galaxies by their shape. There are elliptical galaxies, spiral galaxies, and irregular galaxies. Elliptical galaxies are the largest type, and they have the same shape as an egg. Spiral galaxies are next in size, and they look something like a pinwheel with arms twisting around. Irregular galaxies are the smallest, and they can be all sorts of different shapes.

Our solar system is part of a spiral **galaxy** called the **Milky Way**. The Milky Way contains not only our solar system but hundreds of billions of other stars plus clouds of gas and dust.



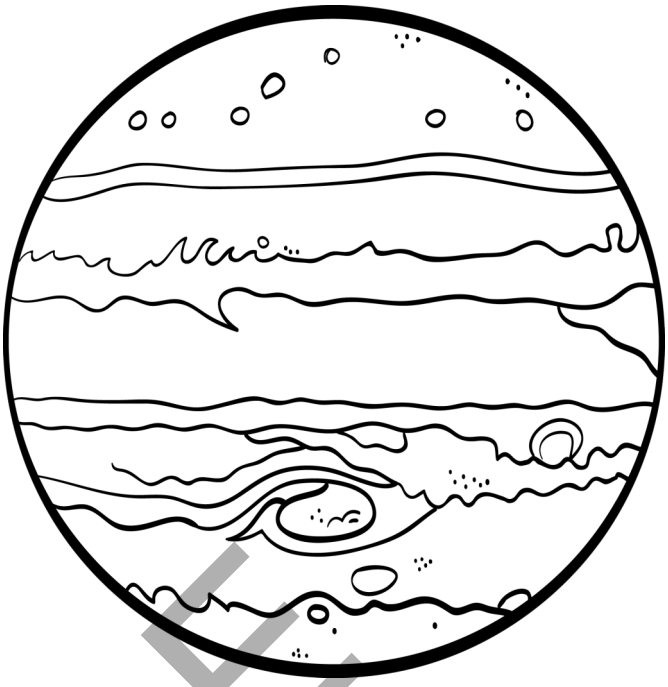
Milky Way galaxy

You know gravity is the force that makes your pencil fall to the floor when you drop it, but did you know gravity doesn't stop when you leave Earth? Gravity is also the force that holds all our planets in the shape of our solar system. It also holds the solar system and all those other stars together in the Milky Way. If you were to step back even further, you would see that the Milky Way galaxy and all the other galaxies are also held together by gravity, and all together, these galaxies and stars and other objects make up the universe.

We don't have time to talk about every star in the universe in this book. As a matter of fact, there is a whole lot scientists don't know about most of those stars, and there are stars and probably whole galaxies scientists haven't even discovered yet! So for this book, we're just going to talk about the planets and some of the most important stars and other objects in our solar system. Are you ready? Let's start at the center of the solar system, at the star we call the sun.

SAMPLE

The last four planets in our solar system are known as the outer planets. They are made mostly of gases and liquids. **Jupiter** is the fifth planet from the sun, and it is the largest planet in our solar system. You could fit more than 1,000 Earths inside Jupiter.

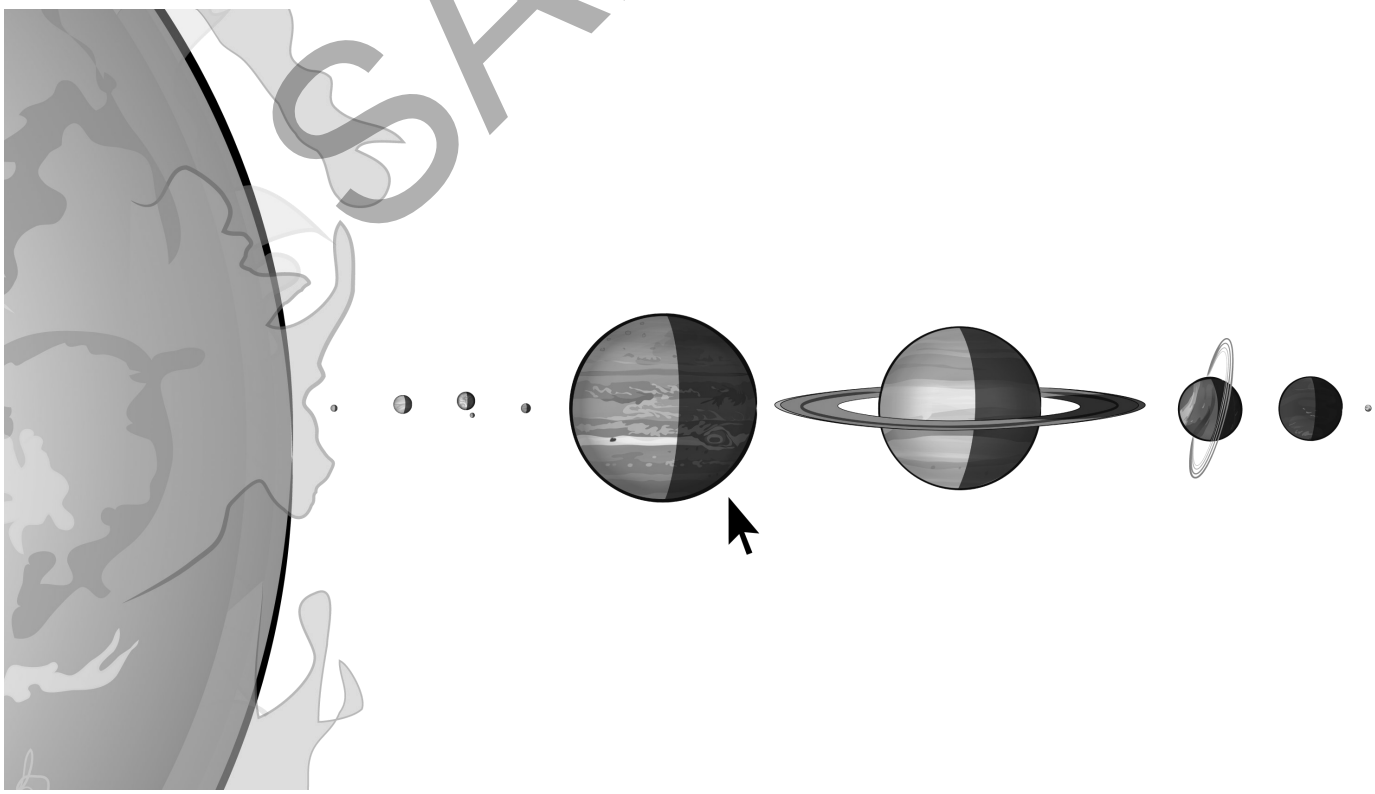


Because Jupiter is so much farther from the sun, it takes it about 12 of our years to make one orbit.

Jupiter doesn't have a rocky crust like the inner planets. Its atmosphere, the gases surrounding the planet, is actually the part we can see and study. We think the temperature in the hottest part of the atmosphere is about 1500 °F (800 °C). It also has very thin rings that are not as large as the rings around its neighbor Saturn.

Jupiter

Jupiter has at least 63 moons that we've found so far. Its biggest moon, Ganymede, is bigger than the planet Mercury!



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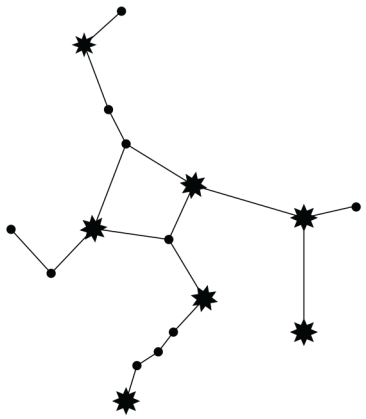
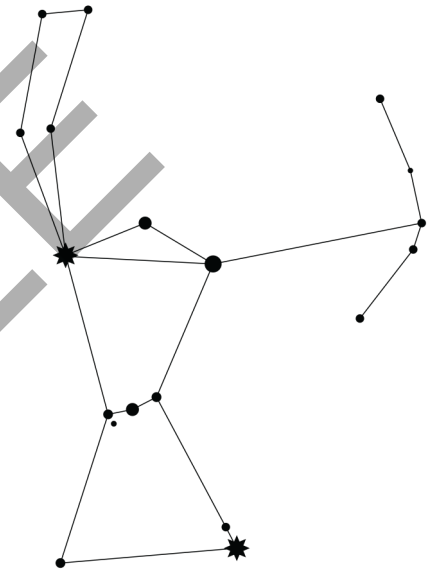


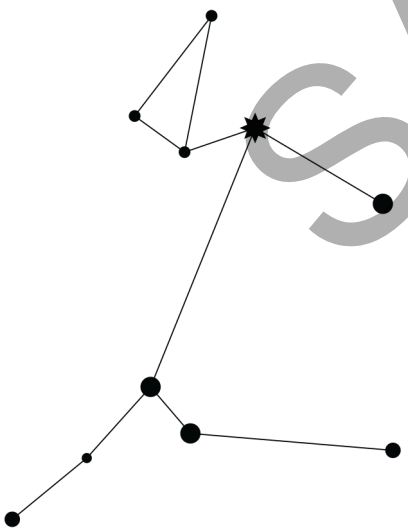
Let's see if we can see shapes in any other stars. What about this constellation? Can you see a body with two legs and two arms? He looks awfully strong to me. That's why he got the name **Hercules**, the name of a very strong man in the stories of the ancient Greeks.

Hercules

This next one looks like a person pulling an arrow back in a bow. In the myths of the ancient Greeks, there was a mighty hunter named **Orion**. When people saw this group of stars looked like a hunter with a bow and arrow, they named it Orion.



Orion



This group of stars looks a lot like a dog! That's how it got the name **Canis Major**. The word *canis* means *dog* in Latin, and the word *major* means *greater.* There is another smaller constellation that looks a little bit like a dog that is called Canis Minor. The star at the dog's shoulder in Canis Major is a very bright star named Sirius, the Dog Star!

Canis Major

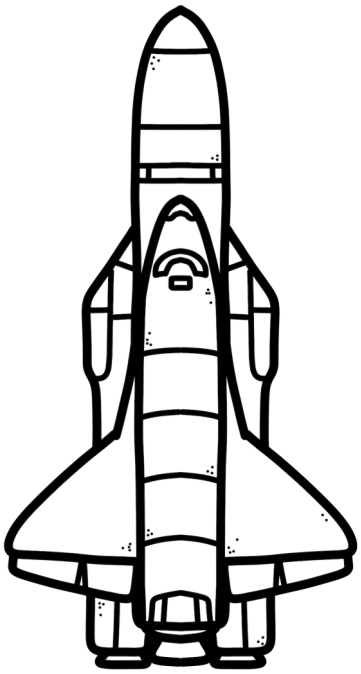
SAMPLE

Galileo was an Italian astronomer who designed many different types of scientific instruments. He made improvements to a device called a refracting telescope and used it to learn much about the solar system. He discovered that the moon has craters and that Jupiter has moons. He discovered that Venus passes through phases, much like the phases of the moon, and learned new things about sunspots and Saturn.

Galileo

People from many different places have made important discoveries about space. Some have studied it from Earth; others have gone up into space. Let's look at just a few of the important events that have happened in the modern exploration of space.

1930: Pluto is discovered
1957: *Sputnik 1*, the first artificial satellite, is launched
1961: Yuri Gagarin becomes the first person to travel in space
1962: *Mariner 2* is sent to explore Venus
1963: Valentina Tereshkova becomes the first woman in space
1969: *Apollo 11* lands on the moon, and Neil Armstrong becomes the first person to walk on the moon
1971: *Salyut 1* becomes the first orbiting space station to have a crew
1976: *Viking 1* and *Viking 2* land on Mars
1981: The space shuttle program begins with space shuttle *Columbia*
1984: Kathryn D. Sullivan becomes the first American woman to walk in space
1992: Mae Jameson becomes the first African American woman in space
1995: Spacecraft *Galileo* reaches Jupiter
2004: The *Cassini* spacecraft reaches Saturn
2004: A private company launches a person into space for the first time
2011: *Atlantis* makes the final space shuttle mission



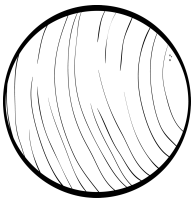
SAMPLE

Review

This planet does not have any moons. Draw an X through it.

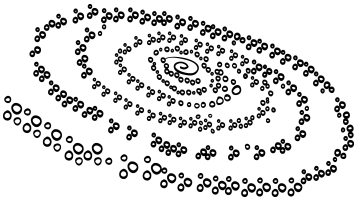
Mercury

Earth

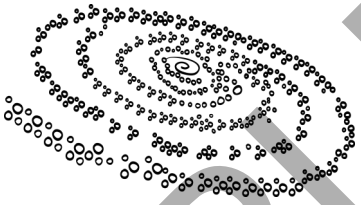


Uranus

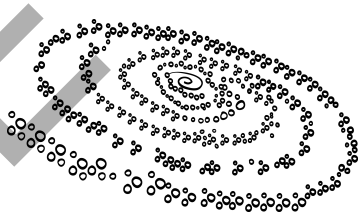
Which of these is the name of the shape of our galaxy? Draw a circle around it.



Elliptical



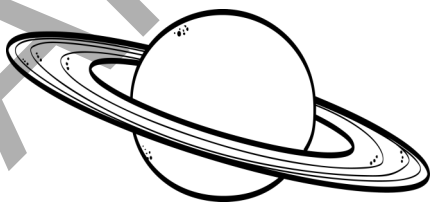
Spiral



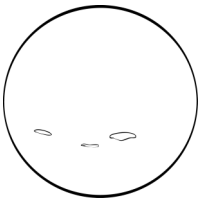
Irregular

This planet was explored by *Mariner 2*. Draw a circle around it.

Venus



Saturn



Neptune

This person was not a famous scientist. Draw an X through him.

Sir Isaac Newton

Galileo

Michelangelo

SAMPLE

Review Answer Key

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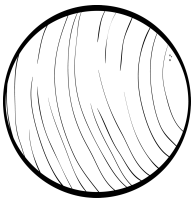
Mercury

Earth



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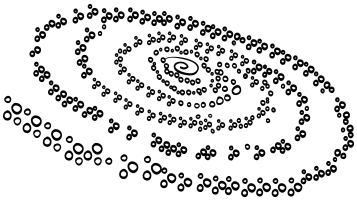

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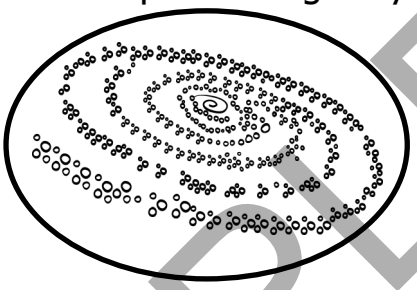

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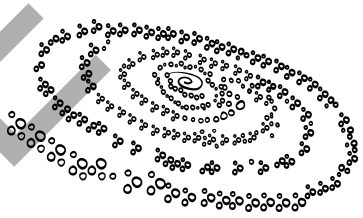

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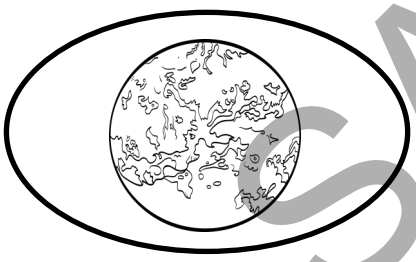

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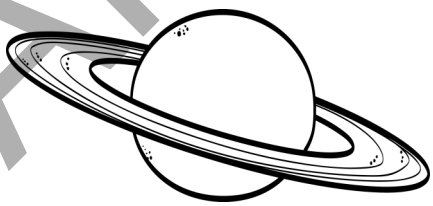
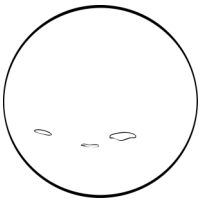


Saturn



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Galileo

Michelangelo

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