

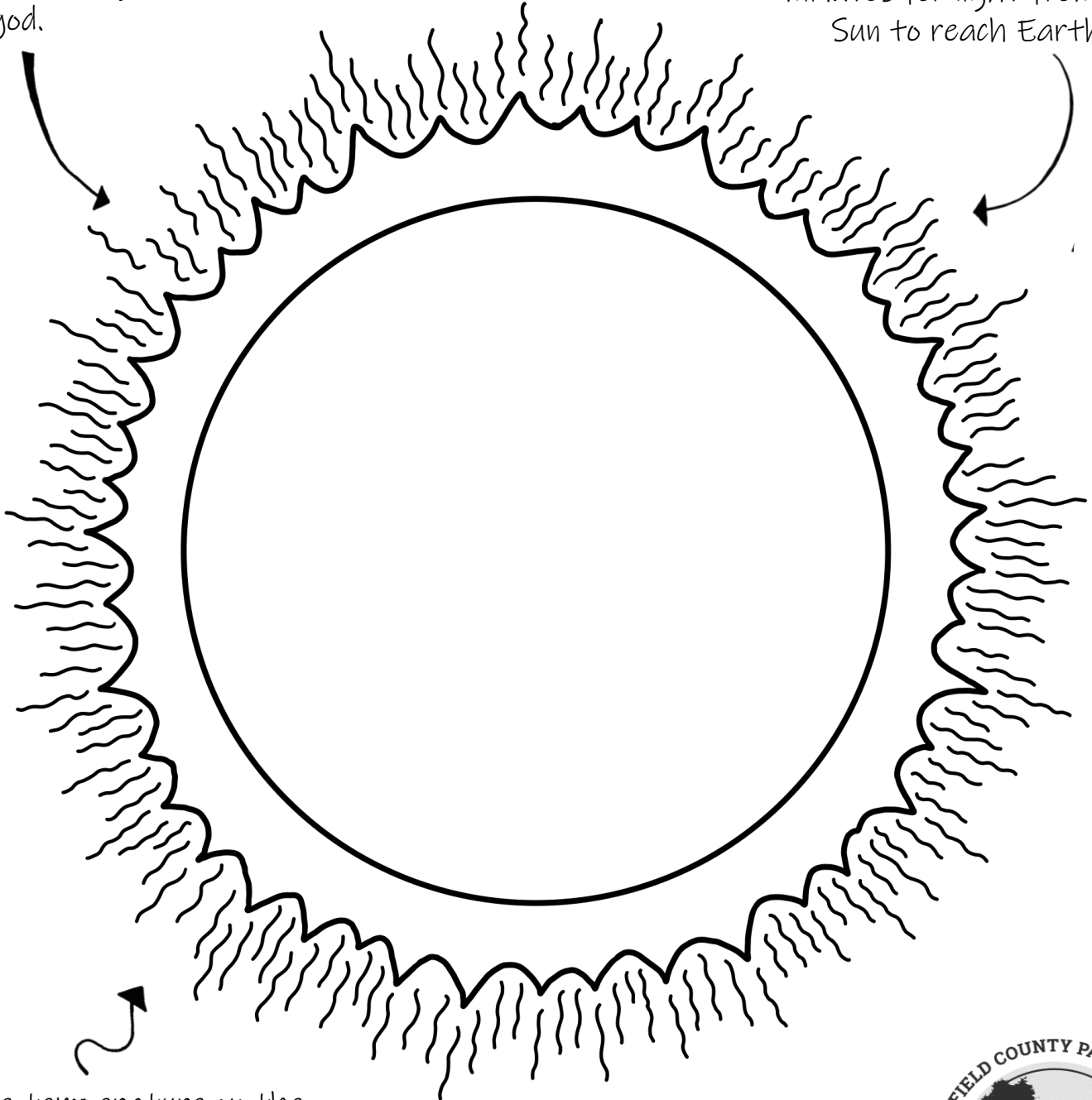
This homeschool activity is appropriate for grades: 3 through 6

Astronomy: The Sun

The Sun is a star, the only one we can see during the daytime. The Sun is the most important source of energy for life on Earth.

The Sun is so important to life on Earth that many ancient civilizations, such as the Aztecs, Egyptians and Romans, saw it as a god.

It takes around 8 minutes for light from the Sun to reach Earth.



The temperature on the Sun is around 5,550 degrees Celsius- that's about 9,941 degrees Fahrenheit!

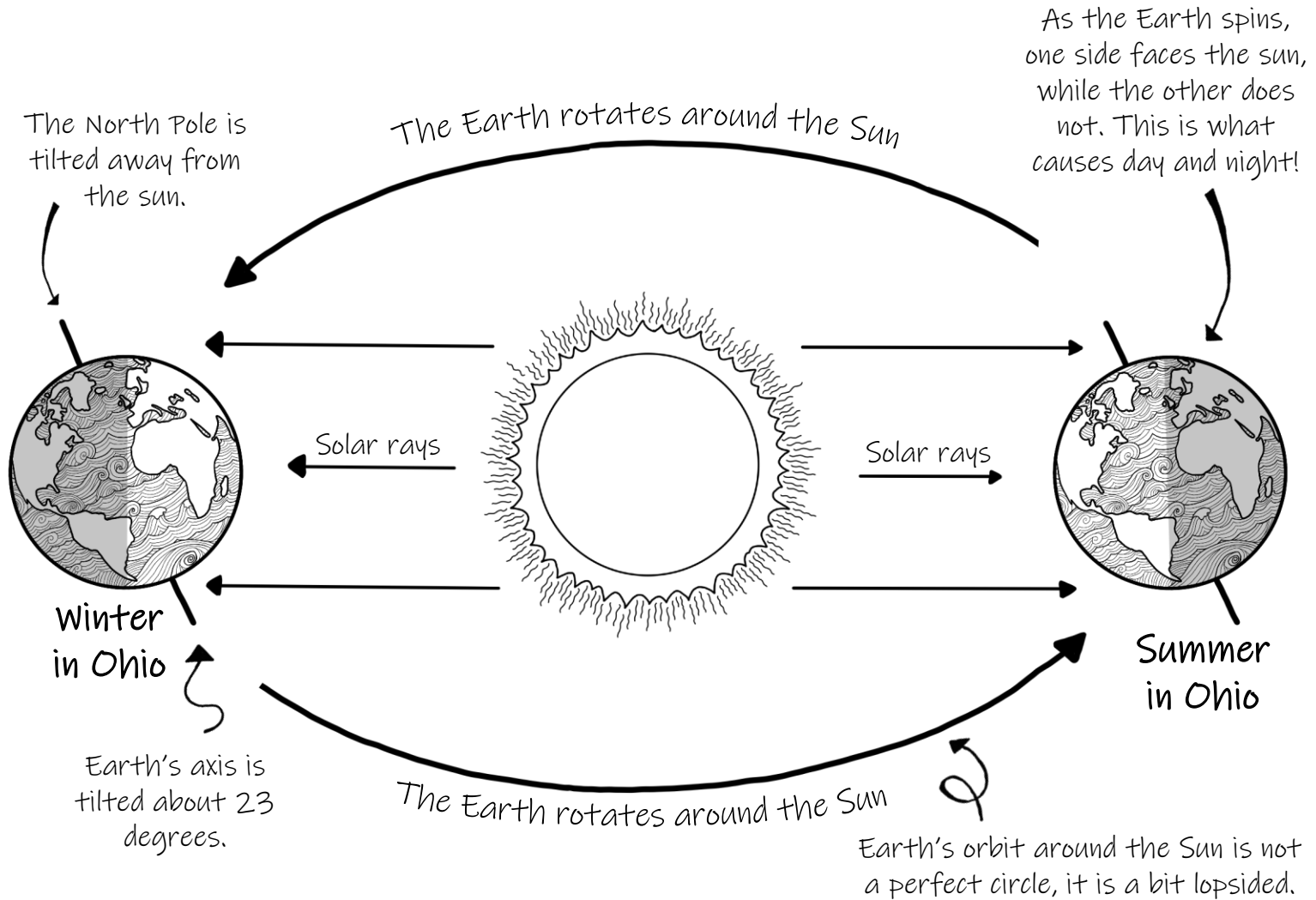
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Sun and the Seasons



Earth's tilted axis causes the seasons. Throughout the year, different parts of the Earth receive different amounts of Sun. When the North Pole is tilted toward the Sun, it's summer in Ohio and the rest of the Northern Hemisphere. The opposite is true when the South Pole is tilted toward the Sun. Then, it is winter in the Northern Hemisphere.



What Caused Earth's Axis to Tilt?

Scientists are not completely sure what caused Earth's Axis to tilt. It is thought that a long time ago, when the Earth was young, something big hit the planet and knocked it off-kilter.

The big thing that hit Earth is called Theia. It blasted a big hole in Earth's surface, sending dust and rubble into space. Many scientists believe some of that rubble eventually became Earth's Moon.

For more resources on the Sun and Earth's seasons, visit FairfieldCountyParks.org/Education-Resources

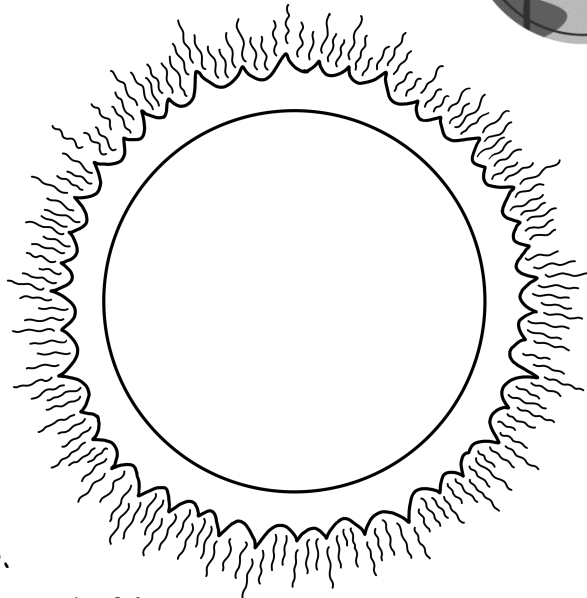
Solar Energy Experiment

This experiment will help you understand solar energy and absorption.



You Will Need:

- A sunny location, preferably outdoors
- 6 pieces of colored construction paper
 - White
 - Yellow
 - Red
 - Black
 - Green
 - Blue
- 6 ice cubes
- Clock



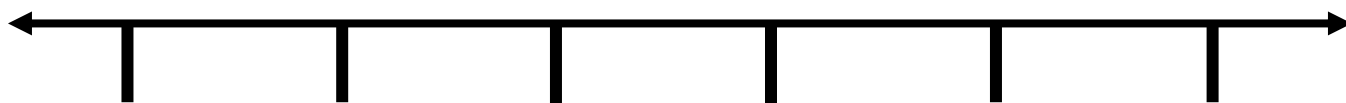
Procedure:

1. Find a sunny location outdoors to set up.
2. Set out six different colors of construction paper.
If it is windy, tape or weigh down the paper so they don't fly away.
3. Put one equal-sized ice cube on each piece of paper.
4. Watch the clock. Make some predictions- which ice cube do you think will melt first. Which do you think will melt last? Why?
5. Write down your observations. Were your predictions right?

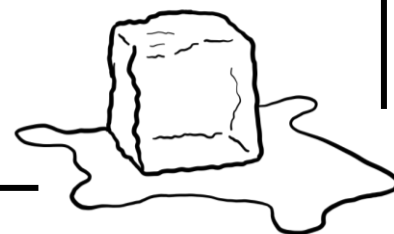
Observation

Melted
Fast

Melted
Slow



Color:



ANSWER: The ice cubes on the darkest colored paper should melt first, while the lighter colors last longer. Why? The color black absorbs the most light. It is the most efficient solar collector. White reflects most of the light and should melt the slowest.

Solar Oven S'mores

Harness the energy from the sun to make a yummy snack!



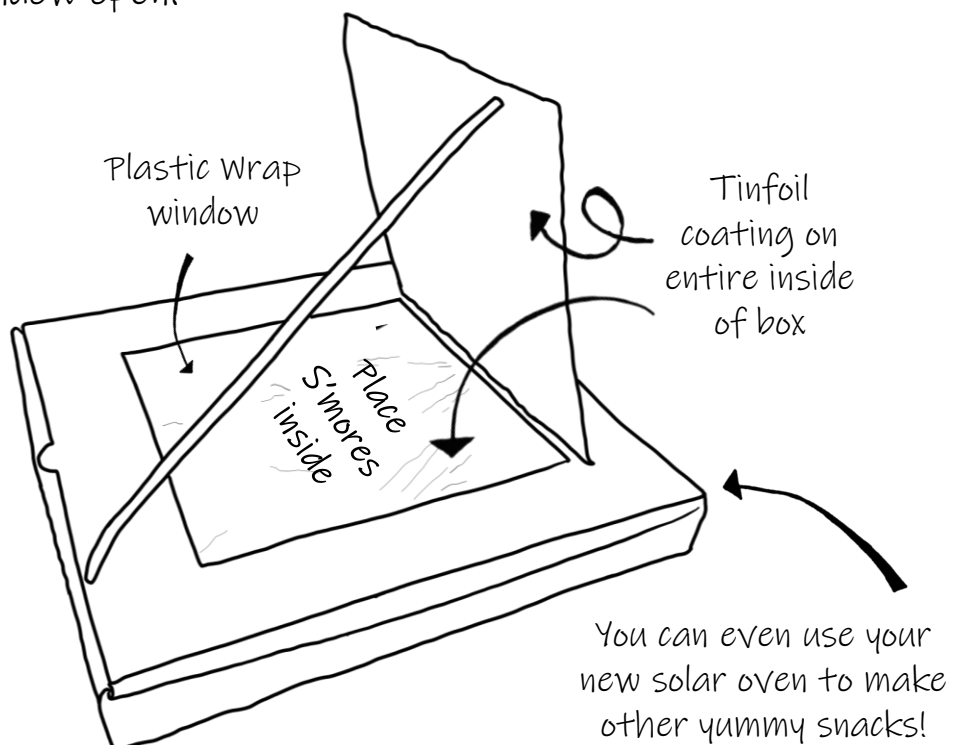
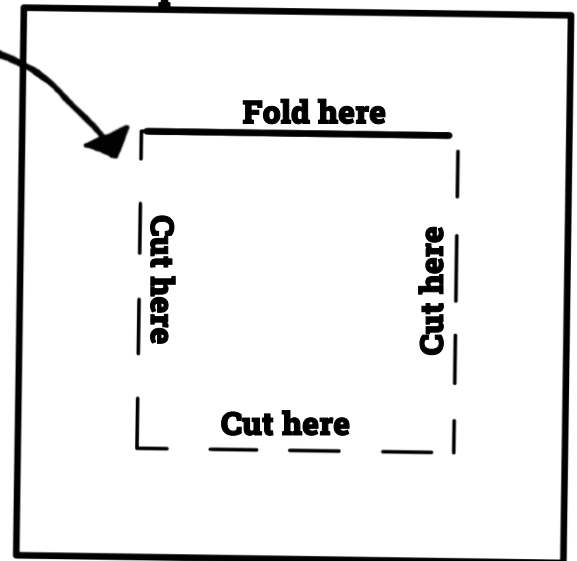
You Will Need:

- A helpful adult
- Clean and empty Pizza Box
- Tinfoil
- Tape and glue stick
- Clear plastic wrap
- Scissors or a box cutter (ask an adult)
- Stick (about 1 foot long)
- Graham crackers
- Marshmallows
- Chocolate Bar

Instructions:

1. Cut three straight lines on the lid of your pizza box. Ask an adult for help.
2. Coat the entire inside of the box (including the inside of the flap) with glue, then cover it all with tinfoil, making it as smooth as possible.
3. Prop open the flap, and tape a large piece of plastic wrap to create a window.
4. Use a stick to keep the window open. Secure it with tape.
5. Wash your hands, then assemble the s'mores. Place them inside the solar oven, with the window open. Put oven in a sunny location.
6. Watch your s'mores to see when they're ready to eat! Depending on the amount of sunlight, they should be ready in 20 to 30 minutes!

Top view of Pizza Box



Make Your Own Sundial



A sundial is used to tell the time of day using sunlight and shadows. Sundials are the oldest known device used to tell time. There are many different types of sundials, but each one usually has a *gnomon*, the item that casts a shadow, and a flat platform.

How it Works:



The Earth is always spinning on its axis. As Earth spins, the sun appears to move across the sky. Really, we are the ones who are moving! Throughout the day, as the sun's position changes, the shadow it casts aligns with markings showing the time of day. Sundials are not always completely accurate, and cloudy weather can often make them difficult to use!

Here are a few easy ways to create your own sundial.
Pick your favorite, or try them all!

Paper Plate Sundial

For this activity use the sundial face template. This template is set up for Ohio.

You Will Need:

- A helpful adult
- Sundial face (from template)
- Paper Plate
- Glue Stick
- Bendy straw, or a thin stick
- Scissors
- Compass
- Tape
- Sharpened pencil

Instructions:

1. Carefully cut out the sundial face from the template.
2. Glue the template to the underside of a paper plate.
3. Poke a hole through the center of the plate using the sharpened pencil.
4. Push the straw through the hole, and tape the short end underneath to hold it in place.
5. Take your sundial outside, and place it in a location that gets plenty of sunlight.
6. Using your compass, find which direction is north.
7. Point your sundial so the top faces north, then tilt that straw slightly so it also faces north. This will cast a longer shadow.
8. Observe your sundial throughout the day and watch the shadows move. Does it always tell the correct time? What problems might someone have by telling time with a sundial?

Make Your Own Sundial II

Here are a few easy ways to create your own sundial. Pick your favorite, or try them all!



Human Sundial

This activity works best if you start in the morning (around 9am) and end in the afternoon (around 3pm). Make sure you have sunny weather in the forecast!

You Will Need:

- A sunny day
- A helpful adult or a friend
- Large concrete or sidewalk area
- Sidewalk chalk
- Yardstick
- Clock

Instructions:

1. Find a sunny location outdoors. You will need a large area with concrete, like a playground or sidewalk.
2. With chalk, mark a big X on the area where you will stand.
3. Stand on your chosen spot. Have your helper trace your shadow with chalk.
4. Using the yardstick, draw a straight line from you, through your shadow. Write down the time above your shadow.
5. Repeat steps 3 and 4 throughout the day, marking the time above the line at the top of your shadow.

Observations:

What did you notice about your shadow? Did it move throughout the day? What else changed about your shadow? What do you think caused these changes?

Garden Sundial

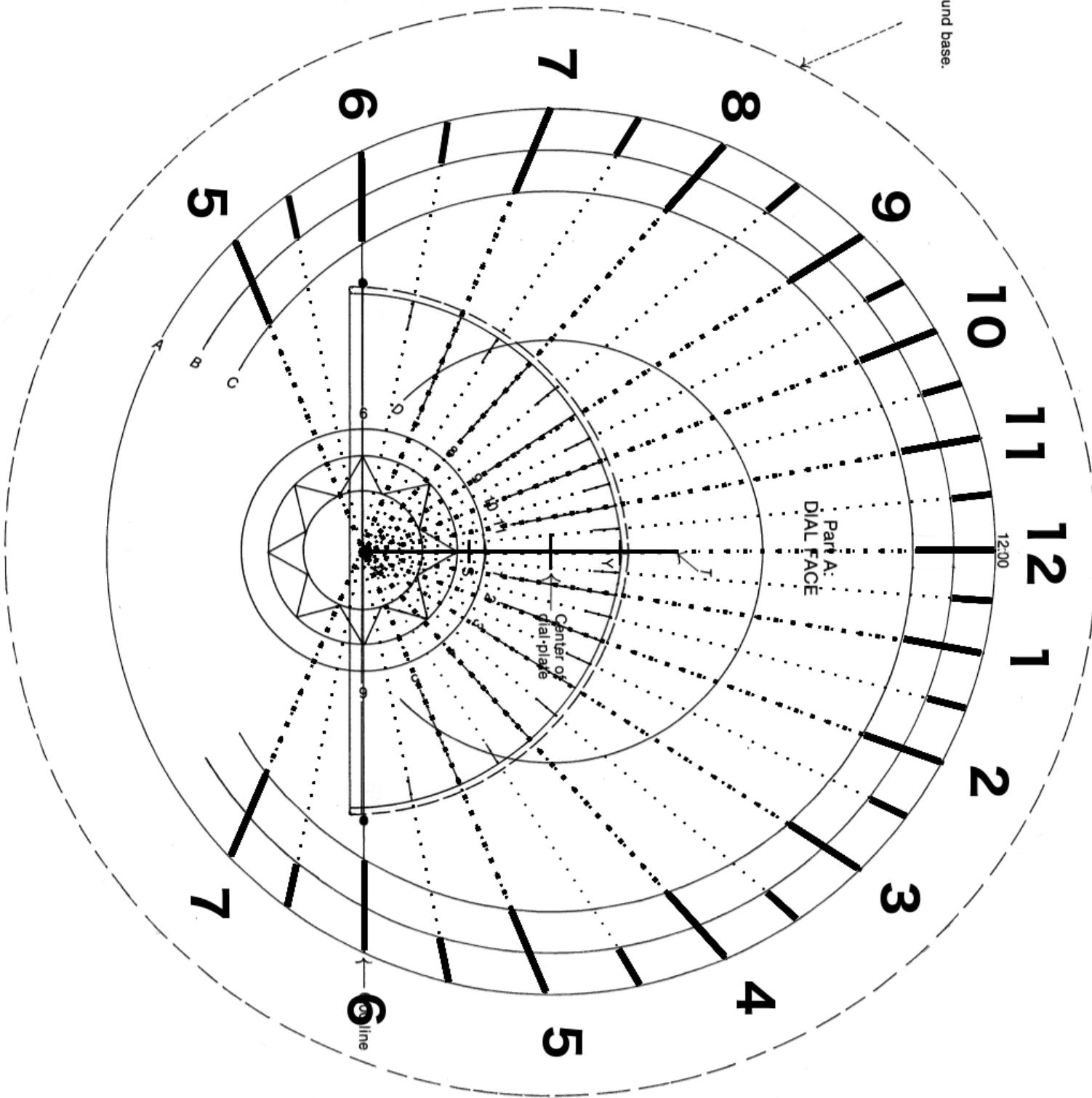
You Will Need:

- A sunny day in a garden area
- A helpful adult
- 10 Flat rocks or large seashells
- Permanent marker
- Clock
- Stick (about 1.5 ft long)

Instructions:

1. Begin in the morning. Find a sunny location outdoors. Place the stick in the ground, with at least 1 ft in the air.
2. With help from an adult, write the time of day on a rock or seashell. Then, follow the stick's shadow and place the time at the top.
3. Repeat step 2. Return each hour (or half hour) to chart the time.

Cutting line for round base.



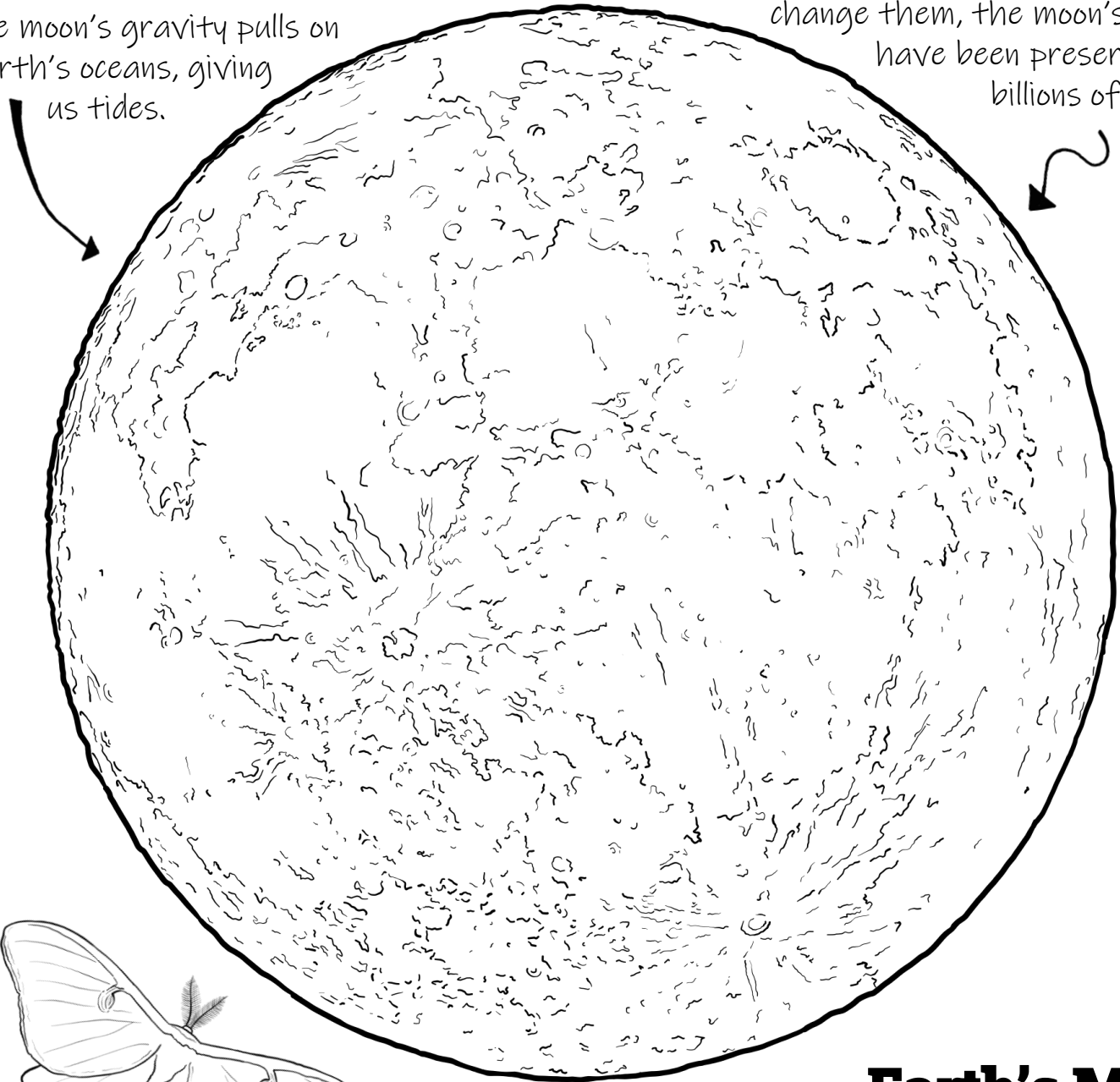
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Astronomy: Earth's Moon

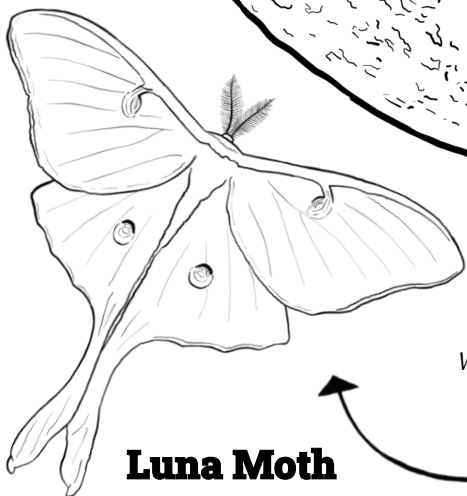
The moon is the largest and brightest object in our night sky. It is also the only place outside of Earth that humans have personally visited and set foot.

The moon's gravity pulls on Earth's oceans, giving us tides.

Since there is not any weather on the moon to change them, the moon's craters have been preserved for billions of years!



Earth's Moon



Luna Moth

'Luna,' means moon, this giant silk moth received its name from the moon-like eye-spots on its wings!

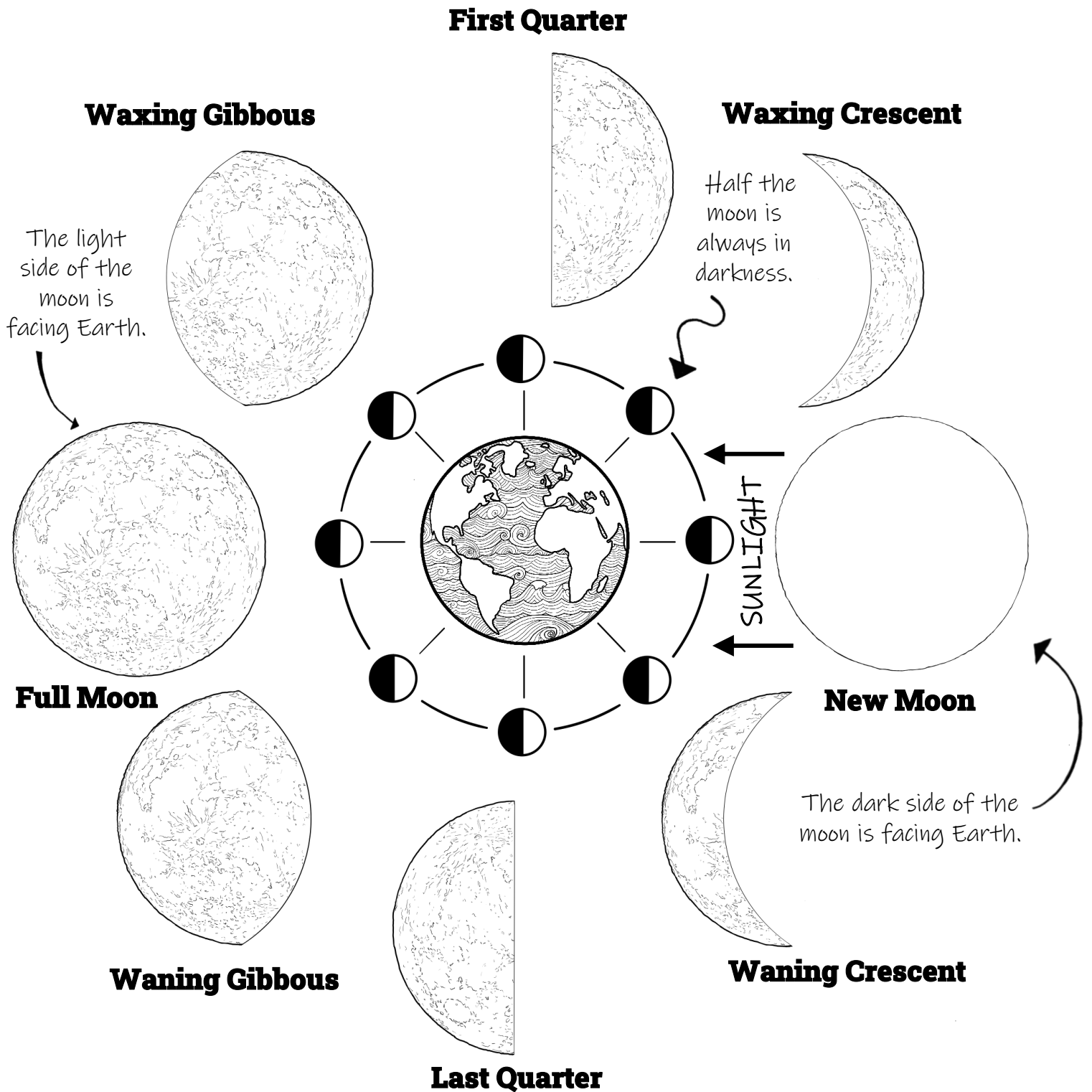
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Moon Cycle



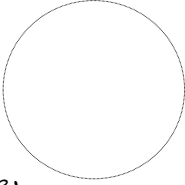
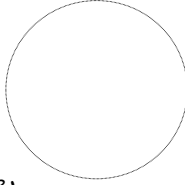
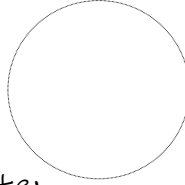
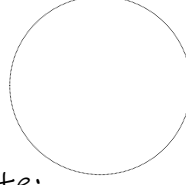
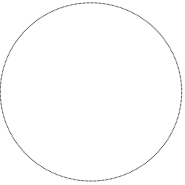
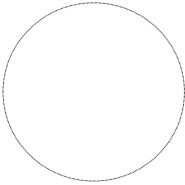
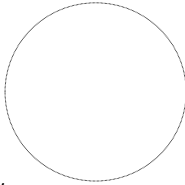
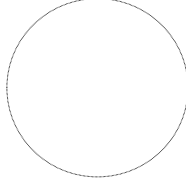
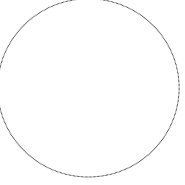
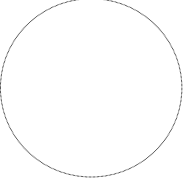
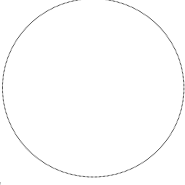
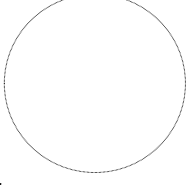
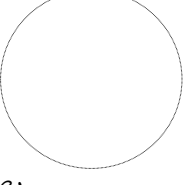
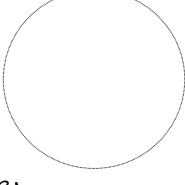
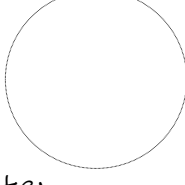
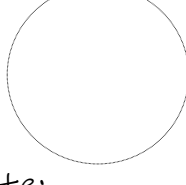
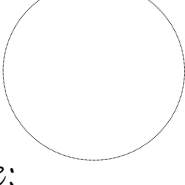
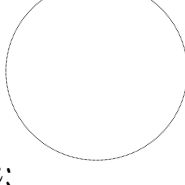
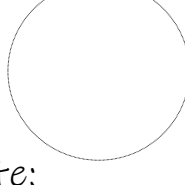
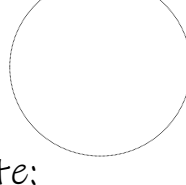
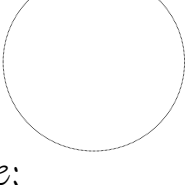
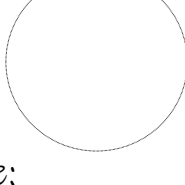
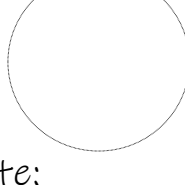
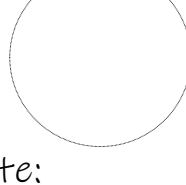
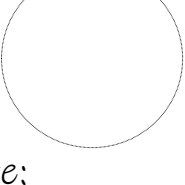
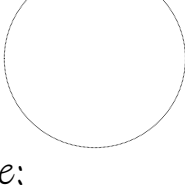
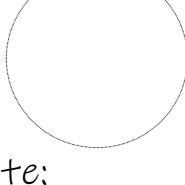
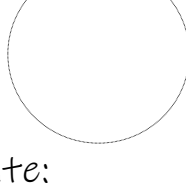
Here are the eight phases of the moon and why they happen. Sunlight lights up half of the moon at all times, but as it orbits around Earth sometimes the lit part cannot be fully seen. The moon can appear as full, or only a section of the sunlit part can be seen (crescent or quarter moon), and sometimes it cannot be seen at all (new moon)!



Moon Diary



Use this chart to follow the moon's progress for four weeks
Draw in clouds for any night you cannot see the moon!

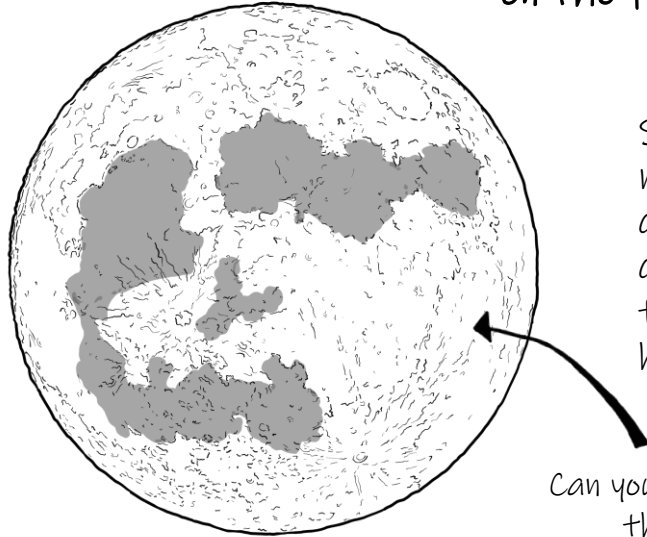
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Moon Stories from Around the World



Storytelling is a human tradition. Long before books and movies, people would gather in small groups and tell each other stories. These legends would often attempt to explain parts of the world they did not yet understand. Some of the stories were about the Moon.

From a distance, the Moon's surface looks like a mixture of dark and light areas. Many cultures around the world had folklore about the shapes they believed were on the face of the moon.



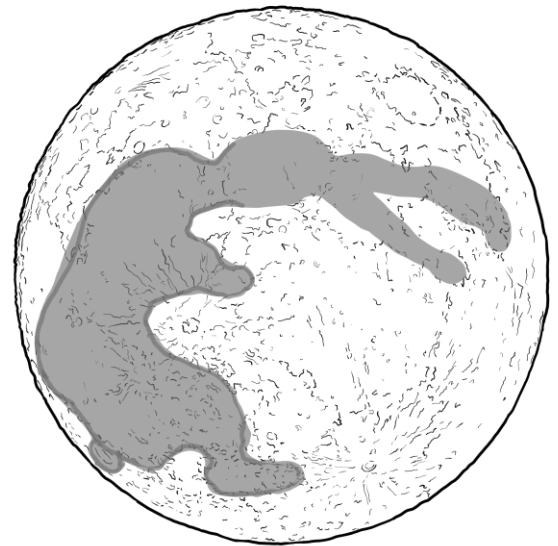
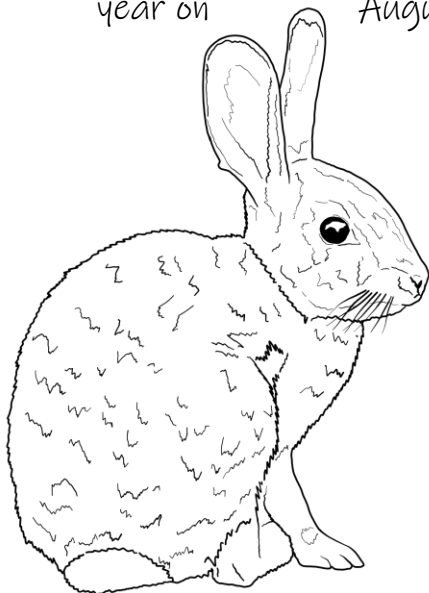
The Man in the Moon

Some of the most popular tales tell about the man of the moon. In German folklore, the man is carrying a bundle of sticks and a lantern. Other cultures decided the shapes showed a lady on the moon, while still others saw a young couple holding a pail of spilled milk.

Can you see a face in the moon?

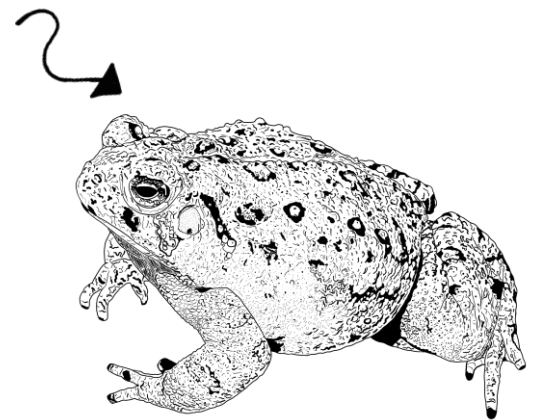
Moon Rabbit

Folklore of the moon rabbit began in China and spread to other Asian cultures. According to legend, the moon rabbit is a companion to the moon goddess. The rabbit lives on the moon and can be seen every year on August 15 (Mid-Autumn Day).



Other Animals

There are tales from around the world that tell about the moon frog, toad, moose, buffalo, fox, dragon and crab. What animal can you see on the face of the moon?



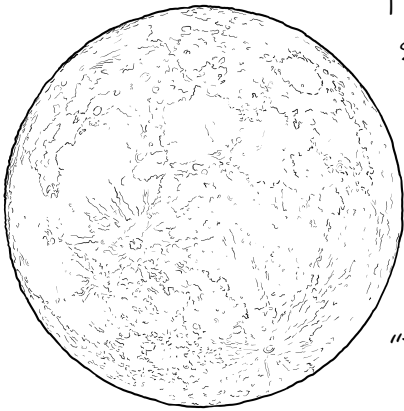


The Fox in the Moon

This short story has been adapted from Peruvian folklore. Peru is a country in South America. The area is home to sections of the Amazon Rainforest and the Andes Mountains. Indigenous cultures in the region have a long history of storytelling, and this legend has been shared for many hundreds of generations.



A long, long time ago, Fox and Mole were the best of friends. On nights when the moon was full, they liked to sit outside in the bright moonlight.



They would often stay up late into the night talking and sharing stories. One night, Fox told Mole that his biggest wish was to travel to the Moon. Mole didn't care at all about going to the Moon, all he wanted to do was eat worms- yummy worms for breakfast, lunch and dinner.

"I'd love to go to the Moon," said Fox, "what a wonderful place it must be!"

"That's the craziest idea I've ever heard!" answered Mole, "The moon is so high up, it's just impossible."

"I have a plan," replied Fox, "I'll wait for the crescent moon, then we can tie a very long rope to the Moon and climb up. It should be easy!" Mole frowned; he didn't really want to go to the Moon. Fox lied, "did I tell you there are worms on the Moon?"

"There are?" Mole asked.

"Yes!" Fox fibbed, "Big, juicy worms, as many as you can eat!" And this is how Fox convinced Mole to journey with him to the Moon.



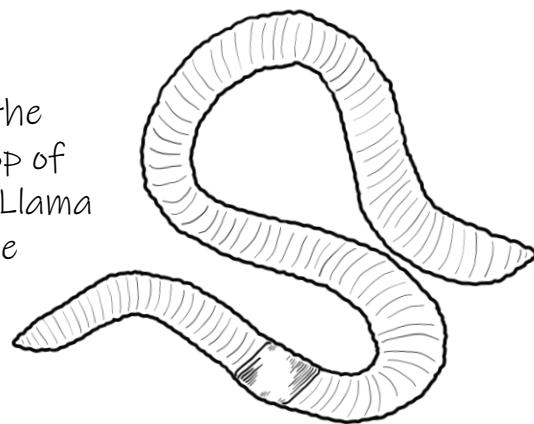
The next night the two friends collected all the dried grass they could find, and began to braid it into the longest rope in the world. They worked together night, after night, until the rope was finished. Then, they waited for a crescent moon to appear in the sky.

Finally, the Moon was the right shape, just a sliver. Fox and Mole went to visit Bear in his cave. Fox asked, "Bear, you are the best tree climber of all. Can you please climb to the top of the tallest tree, and tie this rope around the Moon?"

Bear said he would do his best.

Bear climbed to the top of the tallest tree. When he got to the top, he stood on the tips of his paws, and stretched as far as he could go, but he could not reach the Moon.

Next, Fox and Mole asked Llama for help. "Llama, you are the best mountain climber of all. Can you please climb to the top of the tallest mountain and tie this rope around the Moon?" Llama said she would do her best. Llama climbed to the top of the tallest mountain. When she got to the top, at the edge of the mountain, she stretched her neck as far as she could go, but she just could not reach the Moon.



So, Fox and Mole asked Condor, a bird, for help. Fox asked "Condor, you can fly higher than anyone else. Can you please fly high up into the sky and tie this rope around the Moon?" Condor said he would do his best.

Condor took the rope with his beak and flew high into the night sky. When he flew as high as he could, he stretched out his neck and was able to tie the rope around the Moon!

"Hurray!" Shouted Fox and Mole from the ground. "Thank you, Condor!" The two friends tied the other end of the rope to a tree, and Fox immediately began to climb.

"Come on, Mole!" Mole was a little scared, the Moon was just so far. He thought of Fox telling him about all the big, juicy worms on the Moon. Taking a deep breath, he closed his eyes, and nervously began to climb.



Up, up and up they climbed. Up past the tallest tree, and past the tallest mountain. Mole was getting worried, "Uhhh, Fox? Are we almost there?"

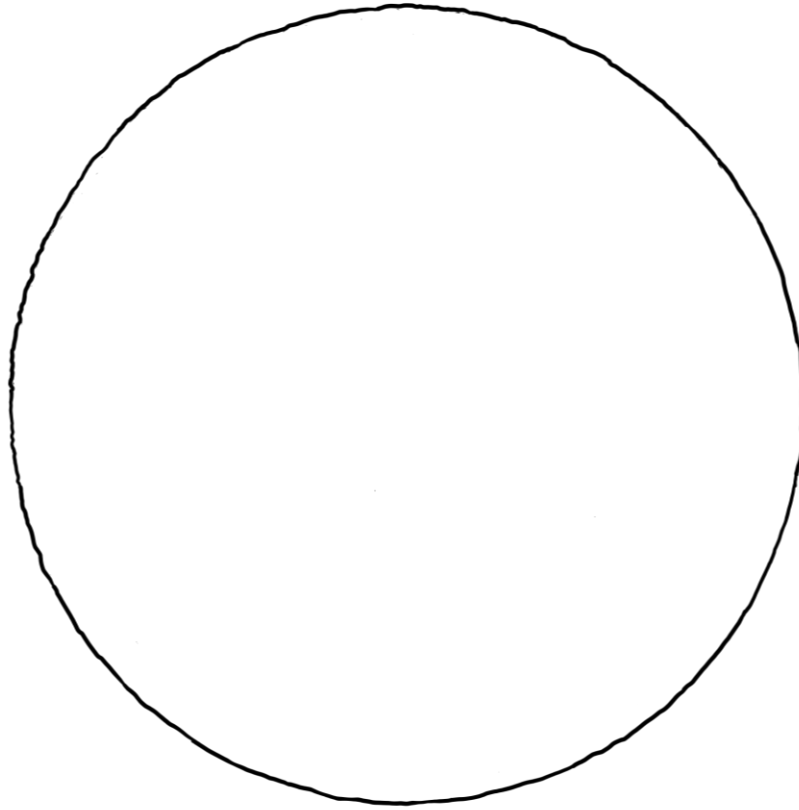
"Almost there- just keep thinking about the worms!" Fox replied, "And, don't look down!"

Higher they climbed, past the highest cloud. Then, Mole looked down. He got so dizzy that he fell, down, down, down, to the ground. He landed so hard that he went deep underground, into the Earth. That is why, to this day, moles still live underground.

And Fox? Fox climbed the all the way to the Moon and lived there for the rest of his life. If you go outside on a clear night with a full Moon, you can still see the shape of Fox on the surface of the Moon.



Go outside on a night with a full Moon. Draw what you can see in the Moon, and then write a short story explaining how it got there. Use pictures to help tell your story.



Title:

Key Words:



Axis	An imaginary line that runs through an object. Earth's axis connects the north and south poles.
Celsius	A temperature scale where water freezes at 0 degrees Celsius and boils at 100 degrees Celsius.
Condor	A very large vulture with a bare head and neck. The Andean Condor lives in the area of the Andes Mountains.
Crater	A large, bowl-shaped hole on the surface of the moon or a planet.
Crescent	Shape of the moon when it is less than half full.
Fahrenheit	A temperature scale where water freezes at 32 degrees Fahrenheit and boils at 212 degrees Fahrenheit.
Gibbous	Between a full and last quarter moon.
Gravity	The force that pulls two objects towards each other. Earth's gravity is what keeps you on the ground.
Hemisphere	Half of a sphere (ball). Earth has four hemispheres- the northern, southern, eastern and western.
Indigenous People	People who were native to and lived in an area hundreds to thousands of years ago.
Sundial	A device that shows the time of day by the position of a shadow cast by the sun.
Theia	Long ago, something big hit Earth and knocked it off-kilter. Scientists call this big object <i>Theia</i> .
Waning	The moon appears smaller every night. From full moon to new moon.
Waxing	The moon appears larger every night. From new moon to full moon.