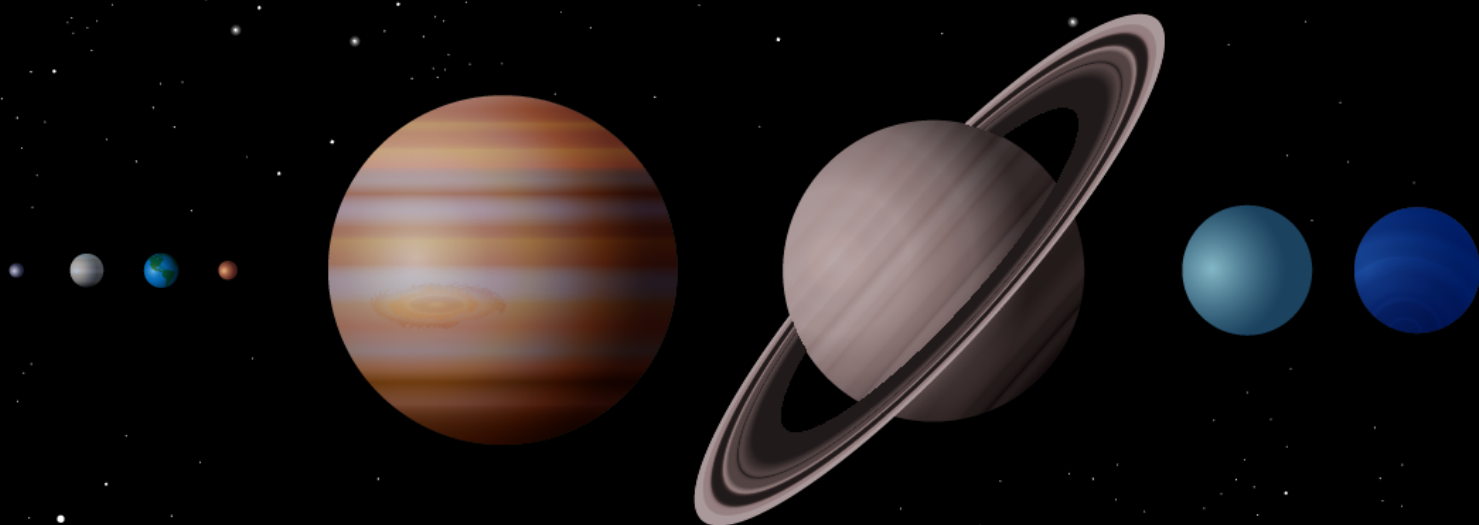


# Family Unit Study: *The Solar System*



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## FAMILY UNIT STUDIES

# Welcome Home!

Thank you so much for choosing a How Wee Learn Family Unit Study. This unit study has been created with care by me, a homeschooling Mom and former teacher. These unit studies have worked so beautifully with my own family, I knew they must be shared. My time in the classroom, certification as a Reading Specialist, and 18 years as a mom has given me a unique perspective on what children truly 'need to know'.

### What is a unit study?

A unit study focuses on critical thinking and problem solving, allowing children to dive deep into fascinating topics and engage in meaningful learning.

When a child is engaged in what he or she is learning, that learning sticks. And when a child is engaged *and fascinated* in what he or she is learning, learning is amazingly fun for the whole family! Say goodbye to those power struggles.

Each unit study is broken down into ten topics with manageable, bite-sized amounts of incredible information. Each of these ten topics includes a hands on activity, a math or literacy enrichment activity, a curated YouTube video, book suggestion, interesting fact and discussion question.

### What are the components of a unit study?

#### HANDS ON ACTIVITY

Each of the ten topics includes a hands on activity that brings the information shared and discussed to life! This allows children to really engage in and solidify their learning. The hands on activities use items you likely have already. If you do not have an item, think creatively about what you do have and adapt. No buttons? I bet beads could work. No pipecleaners? Maybe you have some yarn!

#### MATH ENRICHMENT WORD PROBLEM

Each unit study includes five math word problems modified to three levels so they are fitting for the whole family. They cover five math strands: Number Sense, Geometry, Measurement, Patterning and Data Management/Probability. The word problem introduces your child to each of these areas with

the belief of quality over quantity. This is not a full math curriculum of course, but an enrichment opportunity and chance to be exposed to some real world math.

As you go through a question, consider how you might change it slightly to ask a follow up question. Perhaps you could ask, "What would happen if there were 6 birds instead of 5?" Or you might get out some manipulatives and help your child dive into deeper learning about the geometry topic introduced.

#### LITERACY ENRICHMENT ACTIVITY

When a child is learning about a fascinating topic, there are so many natural opportunities to tie in literacy development. Reading, researching, recording information, labeling, and note taking will all happen naturally.

On top of this, each unit study includes five literacy enrichment activities modified to three levels so they are fitting for the whole family. Creating poems, public speaking, practicing letter formation, and literacy scavenger hunts are all fun ways literacy learning is brought to life with these unit studies.

#### CURATED YOUTUBE VIDEO

Each of the ten topics includes a carefully curated YouTube video. Dive into some fun and easy learning with experts in the field, entertaining stories, and inspiring tales, all selected to highlight key learning concepts. Enjoy some time snuggled on the couch learning with popcorn and a movie!

#### BOOK SUGGESTION

The book suggestions for each topic are just that—suggestions. Any books at all on the unit study



theme are strongly encouraged. Immersing our children in a literacy-rich environment and offering plenty of time to dive into research, pictures, and stories is key for child-led learning.

### INTERESTING FACT

Did you know that elephants suck their trunks much like babies suck their thumbs? Or that a human has the same number of neck bones as a giraffe? Interesting facts are a wonderful way to spark a child's interest and imagination, which is why every topic includes an interesting fact.

### DISCUSSION QUESTION

Asking the right questions and having meaningful discussions is a wonderful way to meet your child at his or her current level of understanding and to help your child grow his or her learning and thinking about topics. So much can be learned through one meaningful discussion!

### How do I use a unit study?

These unit studies are completely flexible and can be used however you wish. For those who would like a few suggestions, I will outline two possible ways you might choose to use these unit studies.

#### OPTION 1: FOCUSED UNIT STUDY

Your family might choose to focus on one unit study over a two day period.

Day 1	<ul style="list-style-type: none"> <li>Introduce the topic with the curated YouTube video</li> <li>Have an amazing discussion using the discussion question as a prompt</li> <li>Research more about the topic with the suggested book or a book of your choice</li> <li>Read the interesting fact together</li> </ul>
Day 2	<ul style="list-style-type: none"> <li>Dive into the hands on activity for some deep learning</li> <li>Complete the math or literacy enrichment question</li> </ul>
Day 3+	<ul style="list-style-type: none"> <li>Core skill work in reading, writing and math at your child's individual level</li> <li>Family outings</li> <li>Extracurricular activities</li> <li>Start another topic!</li> </ul>

#### OPTION 2: BLENDED UNIT STUDY

Alternatively, your family might choose to blend the unit study with your core skill learning over a three day period.

Day 1	<p>Morning:</p> <ul style="list-style-type: none"> <li>Core skill work in reading, writing and math at your child's individual level</li> </ul> <p>Afternoon:</p> <ul style="list-style-type: none"> <li>Introduce the topic with the curated YouTube video</li> <li>Have an amazing discussion using the discussion question as a prompt</li> </ul>
Day 2	<p>Morning:</p> <ul style="list-style-type: none"> <li>Core skill work in reading, writing and math at your child's individual level</li> </ul> <p>Afternoon:</p> <ul style="list-style-type: none"> <li>Research more about the topic with the suggested book or a book of your choice</li> <li>Read the interesting fact together</li> <li>Complete the math or literacy enrichment question</li> </ul>
Day 3	<p>Morning:</p> <ul style="list-style-type: none"> <li>Core skill work in reading, writing and math at your child's individual level</li> </ul> <p>Afternoon:</p> <ul style="list-style-type: none"> <li>Dive into the hands on activity for some deep learning</li> </ul>
Day 4+	<ul style="list-style-type: none"> <li>Core skill work in reading, writing and math at your child's individual level</li> <li>Family outings</li> <li>Extracurricular activities</li> <li>Start another topic!</li> </ul>

There is no right or wrong way to dive into this unit study. When learning is this exciting, you simply cannot go wrong!

I hope you and your family love this unit study! If you have any questions at all, wish to purchase more unit studies, or if I can be of assistance, please visit [www.howweelearn.com/family-homeschooling-unit-studies](http://www.howweelearn.com/family-homeschooling-unit-studies) or email me at [sarah@howweelearn.com](mailto:sarah@howweelearn.com).

xo  
Sarah



## UNIT STUDY: THE SOLAR SYSTEM

# Book List



### **The Sun Is Kind of a Big Deal** by Nick Seluk

This funny and factual picture book from Awkward Yeti creator Nick Seluk explains every part of the Sun's big job: keeping our Solar System together, giving Earth day and night, keeping us warm, and more.



### **100 Things to Know About Planet Earth** by Frederico Mariani

What are phantom islands? How did the Black Death cause an ice age? How could graffiti save endangered tortoises? Find the answers to these questions and 97 more in this bold, graphic and exciting book, full of amazing things to know about Planet Earth.



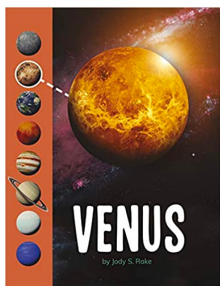
### **National Geographic Little Kids First Big Book of Space** by Catherine Hughes

These colorful pages will introduce young children to the wonders of space, with colorful illustrations by David Aguilar and simple text that is perfect for beginning readers or for reading aloud.



### **Mars: The Red Planet: Rocks, Rovers, Pioneers, and More!** Elizabeth Carney

Budding scientists and kids curious about Earth's next-door neighbor can blast off to the red planet!



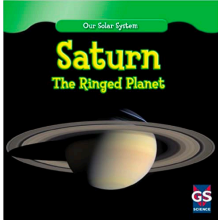
### **Venus** by Jody S. Rake

The second brightest object in the sky, after the moon is Venus. Learn all about the second planet from the Sun with this book.



### **Jupiter** J P Bloom

Learn about the fifth planet from the Sun and the largest planet in our Solar System with simple, easy-to-read text alongside striking images and diagrams that will assist young readers in learning.



### **Saturn: The Ringed Planet**

Daisy Allyn

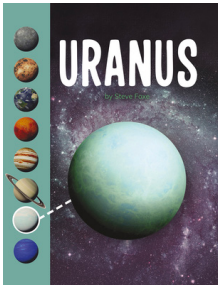
Because of its ring system, Saturn is often considered one of the most interesting planets in our Solar System. But there's much more that is worth knowing about the ringed planet.



### **A Place for Pluto**

Stef Wade

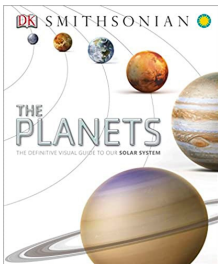
Pluto got the shock of his life when he was kicked out of the famous nine. His planet status was stripped away, leaving him lost and confused. Poor Pluto! But when Pluto is about to give up, he runs into a dwarf planet and finally finds his place in the Solar System.



### **Uranus**

Steve Foxe

Uranus is the seventh planet from the Sun and has a special feature, it tilts! Discover the mysteries of this ice giant that sits half in darkness for more than 40 years at a time!



### **The Planets: The Definitive Visual Guide to Our Solar System**

DK

Featuring all-new 3D models built using data gathered by NASA and the European Space Agency, The Planets is an awe-inspiring journey through the Solar System, from Earth to Mars and beyond.



## TOPIC 1

# The Sun

The Sun is a star and the center of our Solar System. It is orbited by eight planets, along with dwarf planets, asteroids and comets. The Sun is made of gas, primarily helium and hydrogen, and gives off the heat and light that allows life to survive on Earth. Let's explore...

### Spark Curiosity



Did you know? The Sun is so large, you could fit 1.3 million Earth-sized planets inside of it!



I wonder how close we could get to the Sun in a spaceship?

### Resource Suggestions



#### What Is the Sun?

SciShow Kids

Learn all about what makes the Sun so special.



#### The Sun Is Kind of a Big Deal

by Nick Seluk

This funny and factual picture book from Awkward Yeti creator Nick Seluk explains every part of the Sun's big job: keeping our Solar System together, giving Earth day and night, keeping us warm, and more.

### HANDS ON ACTIVITY

- "DIY Sundial" on page 9

### Literacy Enrichment Activity

As you learn about the Sun, you will learn some new vocabulary as well! Create a Sun out of construction paper by making a yellow circle and lots of strips of yellow paper for the Sun's rays.

- ★ Have your child tell you the new words they have learned. Write one word on each ray (yellow paper strip) and encourage your child to trace it.
- ★★ Have your child tell you the new words they have learned and encourage your child to sound them out using phonetic spelling.
- ★★★ Have your child find new words in your library books and write them independently.





## HANDS ON ACTIVITY

# DIY Sundial

Types of Learning: Making and Recording Observations, Telling Time, Scientific Inquiry, Using Models

### WHAT'S HAPPENING?

A sundial is a device that can tell you what time it is depending on where the Sun casts its shadow on the sundial.

A sundial is made up of two parts: a flat circular plate and a stick called a **gnomon**. The gnomon casts a shadow on the plate and this shadow shows the time.

To understand how a sundial works, we have to understand how the Sun casts shadows. When the Earth rotates on its axis, the Sun appears to move across the sky, causing objects to cast shadows.

So, how does a sundial work? As the Sun changes relative positions in the sky over the day, the position of the shadow cast by the gnomon changes, aligning with the different times marked around the outside of the circular plate. You can tell the time by looking at the marking where the shadow is cast.

*Adapted from Twinkl*

[Check it out here for more interesting facts.](#)

### Materials

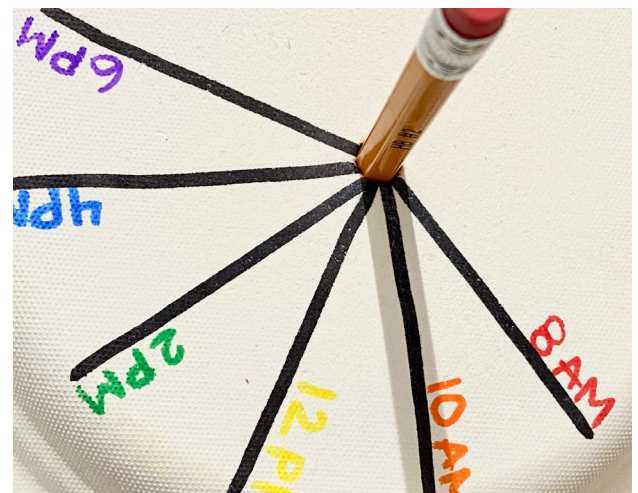
- Paper plate
- Pencil
- Markers, optional
- Compass, optional

### Directions

Making a simple sundial is a wonderful way to see how the Sun's position in the sky and the light it casts changes as the Earth rotates.

1. Turn a paper plate upside down
2. Pierce a pencil through the middle of the plate
3. Pop it outside in the Sun!
4. Check the plate multiple times throughout the day. Draw a line on the plate that matches the pencil's shadow each time you check the sundial. You can also write the current time beside your line.

Tip: Your sundial must face the same direction to be able to tell the time consistently! You can put an arrow for North on your sundial and use a compass to ensure the arrow is always facing North.





## TOPIC 2

# Mercury

Mercury is the closest planet to the Sun, and is named after the Roman god of commerce. It is the smallest planet in our Solar System, only slightly larger than Earth's moon. It is a rocky planet, with a surface covered in craters. Let's explore...

### Spark Curiosity



Did you know? Mercury is the fastest planet in the Solar System, travelling around the Sun in just 88 days (at 48 kilometers per second!).



I wonder how Mercury can have ice on its surface when it gets so hot?

### Resource Suggestions



#### Mercury 101 | National Geographic

National Geographic

Find out the reason behind its incredible speed, if it is indeed the hottest planet in the Solar System, and why the smallest planet in the Solar System is slowly shrinking.



#### National Geographic Little Kids First Big Book of Space

by Catherine Hughes

These colorful pages will introduce young children to the wonders of space, with colorful illustrations by David Aguilar and simple text that is perfect for beginning readers or for reading aloud.

### HANDS ON ACTIVITY

- "Making Craters with Marbles" on page 11

### Math Enrichment Word Problem

Have blocks, stones, or other manipulatives available for these math problems. Be flexible and change up the numbers to make these problems the right challenge for your children. Extend on the problems and ask follow up questions if your child is enjoying these challenges!

- ★ If Mercury had 10 craters and then 10 more craters were created, how many craters would there be in total?
- ★★ If Mercury had 10 craters and received 10 more craters every day for 4 days, how many craters would there be in total?
- ★★★ If Mercury had 10 craters on March 1st and received 4 more craters every day, how many craters would there be on March 14th?



MERCURY

## HANDS ON ACTIVITY

# Making Craters with Marbles

Types of Learning: Making Observations, Exploring Kinetic Energy, Patterns

## WHAT'S HAPPENING?

Mercury is a **terrestrial planet**, meaning it has a hard rocky surface. The MESSENGER spacecraft orbited Mars from 2011 to 2015 and was able to see some spectacular features of its surface.

Mercury has lots of craters, the biggest of which is called the **Caloris Basin**. It is a massive 1,550 km wide (about 960 miles) and 2 km (about 1.2 miles) tall. That's wider than 16,000 football fields put end to end! The Caloris Basin was made by an asteroid hitting Mercury a very long time ago.

Mercury also has some very long cliffs, large areas of smooth land, as well as volcanic damage.

Another odd feature of Mercury's surface is its wrinkles. As the iron ore of the planet cooled and contracted, it made the surface wrinkle. Scientists call those wrinkles

### Lobate Scarps.

*Adapted from Cool Kid Facts.*

[Check it out here for more interesting facts.](#)

## Materials

- Pie pan or plastic dish
- Marbles, rocks, etc.
- Flour
- Sheet, optional

## Directions

Mercury is covered in craters! We can easily recreate how craters are formed at home. This activity is best done outside, or with a sheet down to limit mess.

1. Fill a pie pan with flour.
2. Take some marbles or rocks (or even an orange!) and drop them into the flour. Try dropping some from high distances and some from short distances.
3. Remove the items you dropped and notice the different craters that you created.

How big do you think the asteroid that created the Caloris Basin would have been?





## TOPIC 3

# Venus

Venus is the second planet from the Sun, and is named after the Roman goddess of love and beauty. Even though it isn't the closest planet to the Sun, it is the hottest. On Venus, metal would melt into puddles of liquid! Venus is a rocky planet with a thick atmosphere of carbon dioxide and clouds made of sulfuric acid. Let's explore...

### Spark Curiosity



Did you know? On Venus, a day is longer than a year! It takes 243 Earth days for Venus to spin once on its axis, but only 225 Earth days for Venus to go all of the way around the Sun.



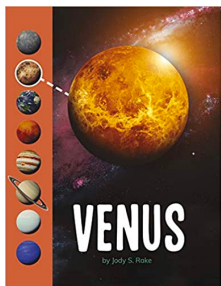
If Venus had aliens, I wonder what they would look like?

### Resource Suggestions



#### SPACE KIDS - Venus - Full Episode

Did you know that the planet Earth has a twin? In this episode find out why Venus is called Earth's louder, more temperamental twin.



#### Venus

by Jody S Rake

The second brightest object in the sky, after the moon is Venus. Learn all about the second planet from the Sun with this book.

### HANDS ON ACTIVITY

- "Create a Rocky Venus" on page 13

### Literacy Enrichment Activity

Throughout this unit study, we will learn all about the 8 planets in our Solar System. Let's practice writing and spelling each one.

- ★ Have your child tell you the planets in order. Write the planets down in this order and encourage your child to read and trace each one.
- ☆☆ Have your child write the planets in order, using library books to spell each planet correctly.
- ☆☆☆ Have your child spell each planet and write them in the correct order from memory.





VENUS

## HANDS ON ACTIVITY

# Create a Rocky Venus

Types of Learning: Creativity, Art

## WHAT'S HAPPENING?

Venus can be best described with two words: cloudy and hot.

The entire surface of Venus is constantly covered by clouds. These clouds are made up mostly of carbon dioxide which has a **greenhouse effect** that traps the Sun's heat like a giant blanket. As a result, Venus is the hottest planet in our Solar System. It is even hotter than Mercury, which is much closer to the Sun.

Venus is a **terrestrial planet** like Mercury, Earth, and Mars. This means it has a hard rocky surface. Its geography is somewhat like Earth's geography with mountains, valleys, plateaus, and volcanoes. It is completely dry, however, and has long rivers of molten lava and thousands of volcanoes. There are over 100 giant volcanoes on Venus that are each 100 km or more across!

Venus is very similar to Earth in size, mass, and gravity. It is sometimes called Earth's sister planet. Of course, Venus' dense atmosphere and intense heat make it very different in many ways. Water, an essential part of Earth, isn't found on Venus.

*Adapted from Ducksters.*

[Check it out here for more interesting facts.](#)

## Materials

- Cardboard
- Scissors
- Hot glue gun and glue sticks
- Pebbles or small rocks
- Paint
- Paintbrush

## Directions

Pull out one of your library books with some photos of Venus to gather some inspiration, then let's paint a rocky Venus!

1. Cut out a circle from a piece of cardboard.
2. Using hot glue (or white glue if you are patient!) glue on as many pebbles or small rocks as you can.
3. Once dry, paint Venus using an image from one of your library books to help you.





## TOPIC 4

# Earth

Earth is the third planet from the Sun, and is the only planet not named after a Greek or Roman god or goddess ('Earth' comes from an old English word which simply means 'ground'). Earth is also the only planet known to harbour and support life. Let's explore...

### Spark Curiosity



Did you know? Earth was once believed to be the center of the universe. People thought that the Earth stayed still and everything else orbited around it.



I wonder how life began on Earth?

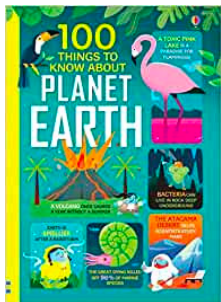
### Resource Suggestions



#### Everything You Need to Know About Planet Earth

Kurzgesagt – In a Nutshell

Planet Earth is this solid thing you are standing on right now. In your everyday life you don't really waste a thought about how amazing this is. A giant, ancient, hot rock. How did it come into existence and how big is it really? You will be surprised.



#### 100 Things to Know About Planet Earth

by Frederico Mariani

What are phantom islands? How did the Black Death cause an ice age? How could graffiti save endangered tortoises? Find the answers to these questions and 97 more in this bold, graphic and exciting book, full of amazing things to know about Planet Earth.

### HANDS ON ACTIVITY

- "Making Sun Prints" on page 15

### Math Enrichment Word Problem

In our Solar System there are 8 planets. Earth is the 3rd planet from the Sun.

- ★ How many planets are closer to the Sun than Earth? How many are farther?
- ★★ If there were 3 Solar Systems exactly the same as ours, how many planets would there be?
- ★★★ If there were 20 Solar Systems exactly the same as ours, how many planets would there be?



EARTH



## HANDS ON ACTIVITY

# Making Sun Prints

Types of Learning: Critical Thinking, Making Observations

## WHAT'S HAPPENING?

Earth is a great planet to live on because it has a wonderful atmosphere around it. The atmosphere keeps us warm, it gives us oxygen to breathe, and it's where our weather happens.

The atmosphere surrounds our planet like the peel of an orange. But it's not the same everywhere. It has different layers with different qualities.

Earth's atmosphere has six layers. They go from the ground all the way to outer space:

1. **Troposphere** (closest to the Earth)
2. **Stratosphere**
3. **Mesosphere**
4. **Thermosphere**
5. **Ionosphere**
6. **Exosphere** (farthest from the Earth)

The stratosphere is where you'll find the very important **ozone layer**. The ozone layer helps protect us from ultraviolet radiation (UV) from the Sun. In fact, the ozone layer absorbs most of the UV radiation the Sun sends to us. Life as we know it wouldn't be possible without this layer of protection.

*Adapted from NASA Science Space Place.*

[Check it out here for more interesting facts.](#)

## Materials

- Dark coloured construction paper
- Coins, small toys, or other small items

## Directions

Why does Earth support life, while no other planet does? Earth is a unique planet. Right now, out of all the planets that have been found, Earth is the only one with life. This is due to a few key factors (read the "What's Happening" section for more!).

One way Earth is unique is having an atmosphere to protect against the Sun's harmful rays. We can make sun prints to show how some of the Sun's rays still come through our atmosphere.

1. Take a piece of dark coloured construction paper and place it outside in a sunny spot.
2. Put coins, small toys, or anything at all on that sheet of paper. Try experimenting with different types and shapes of materials.
3. After a few hours, remove the toys and notice how the colour on the construction paper has faded around those objects.





## TOPIC 5

# Mars

Mars is the 4th planet from the Sun, named after the Roman god of war. It is also known as the “Red Planet” and is a cold, desert-like world. It’s about half the size of Earth, and, like Earth, Mars has seasons, polar ice caps, volcanoes, canyons, and weather! Let’s explore...

### Spark Curiosity



Did you know? Mars has very weak gravity, 37% less than the gravity on Earth. This means you could jump 3x higher on Mars!



I wonder why Mars is red?

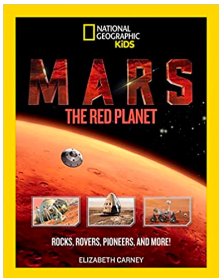
### Resource Suggestions



#### Should We Go to Mars?

SciShow Kids

Jessi and Squeaks love pretending to be space explorers, visiting far-away planets! Did you know that, right now, there are scientists working on ways to send people to other planets in real life? And where better to start than our closest neighbor, Mars?!



#### Mars: The Red Planet: Rocks, Rovers, Pioneers, and More!

Elizabeth Carney

Budding scientists and kids curious about Earth’s next-door neighbor can blast off to the red planet!

### HANDS ON ACTIVITY

- “My Home on Mars” on page 17

### Literacy Enrichment Activity

Mars is a dusty, red planet. Let’s make some red Martian soil by adding a few drops of red food colouring to salt. Once dry, pour the red salt onto a cookie sheet.

- ★ Have your child practice writing letters in the salt tray using a paint brush, encouraging proper letter formation as you go.
- ☆☆ Using library books, have your child practice printing some new words about planets in the salt tray.
- ☆☆☆ Encourage your child to practice spelling some new vocabulary words using their knowledge of the English language. How many words can they spell correctly?





MARS

## HANDS ON ACTIVITY

# My Home on Mars

Types of Learning: Problem Solving, Creativity, Critical Thinking, Architecture, Ir

## WHAT'S HAPPENING?

After Earth, Mars is the most earth-like planet in our Solar System. Mars is in the **Goldilocks Zone**, meaning it's close enough to the Sun to sustain life—not too hot and not too cold.

However, there are still many challenges to living on Mars that have to be addressed. Consider these questions when designing your Mars home:

- Can I bring what I need on a spaceship?  
Can I make what I need on Mars?
- The atmosphere on Mars is unbreathable, so how will we breathe?
- What kind of food will we eat? Will we bring it or grow it?
- How will we stay safe in the extreme temperatures and dust storms?
- How will people get around on Mars?  
Will they walk, drive, fly, or something else entirely?
- How will we get power?

This article has designs people have made for Martian houses. Take a look here: <https://interestingengineering.com/what-would-a-martian-colony-look-like>

*Adapted from Interesting Engineering.*

*Check it out here for more interesting facts.*

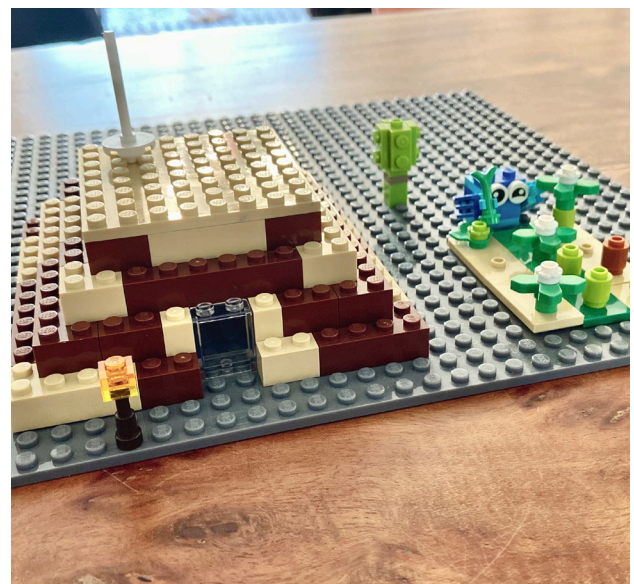
## Materials

- Lego or other building materials

## Directions

Scientists have been studying what it would take for humans to be able to live on Mars in the future! Read the “What’s Happening” section and check out the YouTube video to learn more. After, create a home for yourself on Mars out of LEGO!

1. Grab some LEGO bricks, or any building material you like.
2. Create a home that would be perfect for living on Mars.
3. Consider some of the questions in the “What’s Happening” section as you design your Mars home.





## TOPIC 6

# Jupiter

Jupiter is the fifth planet from the Sun, and is named after the Roman king of gods. It is the largest planet in our Solar System, 318 times more massive than Earth! Jupiter is a gas planet, composed mostly of hydrogen and helium. Let's explore...

### Spark Curiosity



Did you know? The "Great Red Spot" on Jupiter is a storm 24,000 km in diameter that has been brewing for at least 350 years!



I wonder why some planets are rocky and others are made out of gasses?

### Resource Suggestions



#### SPACE KIDS - Jupiter - Full Episode

Chances are if you have looked up at night, you will have seen Jupiter shining brightly. This episode takes you up close for an even better look at the biggest, fastest spinning planet in our Solar System.



#### Jupiter

Learn about the fifth planet from the Sun and the largest planet in our Solar System with simple, easy-to-read text alongside striking images and diagrams that will assist young readers in learning.

### HANDS ON ACTIVITY

- "A Salt Dough Jupiter" on page 19

### Math Enrichment Word Problem

Jupiter is a huge planet that is 11 times wider than Earth. If Earth were a nickel, Jupiter would be a basketball!

- ★ If there were 2 Jupiters side by side, how much wider would they be than Earth?
- ★★ If there were 4 Jupiters side by side, how much wider would they be than Earth?
- ★★★ How many Jupiters would be needed side by side to fit 99 Earths?



JUPITER



## HANDS ON ACTIVITY

# A Salt Dough Jupiter

Types of Learning: Creativity, Art, Following Directions

## WHAT'S HAPPENING?

Jupiter is a kind of planet called a **gas giant**. It consists almost entirely of gases, mainly hydrogen and helium. The planet has no solid surface. Photographs of Jupiter actually show its layers of clouds, not a surface.

Jupiter's clouds appear in coloured spots and bright and dark stripes. These markings show the planet's weather patterns. One of the spots is a huge storm called the **Great Red Spot**. The storm is more than twice as wide as Earth, and has lasted hundreds of years!

Deep inside Jupiter is an area of hot, thick liquid. The planet's center may reach temperatures of 45,000° F (25,000° C).

A system of thin rings surrounds Jupiter. The rings consist of tiny rocks and dust. They are much smaller and dimmer than the planet Saturn's rings.

*Adapted from Kids Britannica.*

[Check it out here for more interesting facts.](#)

## Materials

- Salt dough
- Rolling pin
- Paintbrush
- Water colours or thinned out acrylic paint

## Directions

Today, we are going to paint the beautiful planet Jupiter!

1. Whip up a batch of salt dough (2 cups flour,  $\frac{1}{2}$  cup salt,  $\frac{3}{4}$  cup water, stir it all together).
2. Next, roll out a big, round circle and bake it low and slow in the oven (275 degrees F for an hour or until completely dry).
3. Dive into some of those library books until you find a beautiful picture of Jupiter.
4. Using water colour paint, or thinned out acrylic paint, paint Jupiter!





## TOPIC 7

# Saturn

Saturn is the sixth planet from the Sun, and is named after the Roman god of wealth and agriculture. It is the second largest planet in our Solar System, after Jupiter. Saturn is a gas planet like Jupiter, composed primarily of hydrogen and helium. Let's explore...

### Spark Curiosity



Did you know? Saturn has more moons than any other planet, with 82 moons currently discovered.



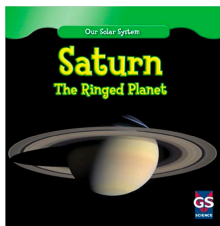
I wonder why Saturn's rings are so much bigger than other planets' rings?

### Resource Suggestions



**SPACE KIDS - Saturn  
- Full Episode**  
TVOKids

Take a tour of the sixth furthest planet from the Sun in our Solar System, Saturn, and get a close up look at its icy, rocky rings.



**Saturn: The Ringed Planet**  
Daisy Allyn

Because of its ring system, Saturn is often considered one of the most interesting planets in our Solar System. But there's much more that is worth knowing about the ringed planet.

### HANDS ON ACTIVITY

- "Floating on Water" on page 21

### Literacy Enrichment Activity

An acrostic poem is a poem that does not typically rhyme. It uses the letters of a word to describe that word. For example:

S: Space

T: Twinkling

A: Astronauts

R: Really hot

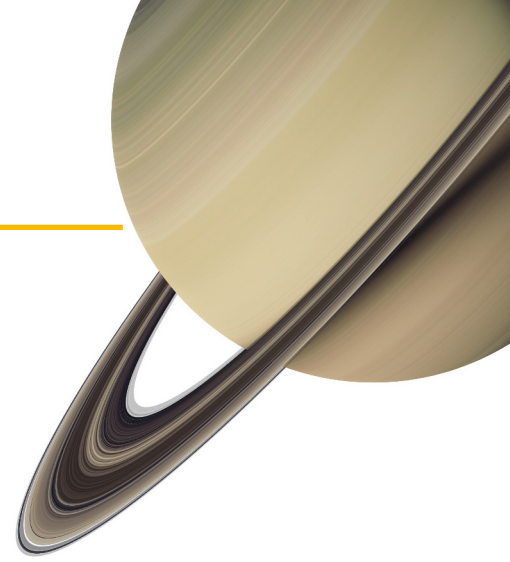
S: Sparkling

- ★ Make an acrostic poem for the word "Saturn". Help your child come up with the words, write them down and encourage your child to use copywork to print them his or herself.
- ★★ Make an acrostic poem for the word "Saturn". Have your child find words in some of the library books and copy them out for his or her poem.
- ★★★ Make an acrostic poem for the word "Saturn". Have your child find words in books, or come up with them on his or her own!





SATURN



## HANDS ON ACTIVITY

# Floating on Water

Types of Learning: Exploring Density, Making Observations, Problem Solving

**WHAT'S HAPPENING?**

Saturn is the sixth planet in our Solar System and is a **gas giant**, like Jupiter. It is best known for its beautiful rings which are made up of billions of particles, mostly ice and some rock.

While not quite as big as Jupiter, Saturn is still massive; more than 700 Earths could fit inside of it!

Saturn is composed of around 96% hydrogen and 4% helium. The layers of hydrogen get denser further into the planet, eventually becoming metallic and leading to a hot interior core.

Despite its massive size, Saturn has the lowest **density** out of all of the planets in our Solar System. In fact, Saturn's density is even less than water. So, if you could find a body of water large enough, Saturn would actually float!

*Adapted from ThePlanets.org.*

*Check it out here for more interesting facts.*

**Materials**

- Various household items

**Directions**

Let's play with density today and see if you can build a structure that will float on water.

1. Using items found around your house, build a structure that you think will float on water. Use the kitchen sink or a bowl filled with water to test your creation.
2. Can you find anything round like Saturn in your house that floats?

P.S. While you are doing this activity, also fill a balloon with water and place it in the freezer for your next activity!





## TOPIC 8

# Uranus

Uranus is the seventh planet from the Sun, and is named after the Greek god of the sky. Uranus is an ice giant, mostly made of flowing icy materials above a solid core. Uranus looks blue from the methane in its atmosphere. While not as spectacular as Saturn, Uranus also has rings. Let's explore...

### Spark Curiosity



Did you know? Uranus orbits the Sun on its side (it looks more like a rolling ball than a spinning top!).



I wonder if there are other planets in the galaxy or universe that rotate on their side?

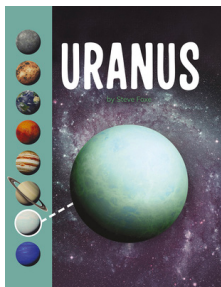
### Resource Suggestions



#### Uranus 101 | National Geographic

National Geographic

Uranus is a planet beyond convention. Find out why it boasts the coldest temperatures in the Solar System, what phenomena caused the unique tilt of its axis, and the curious origin of the planet's name.



#### Uranus

Steve Foxe

Uranus is the seventh planet from the Sun and has a special feature, it tilts! Discover the mysteries of this ice giant that sits half in darkness for more than 40 years at a time!

### HANDS ON ACTIVITY

- "Icy Blue Process Art" on page 23

### Math Enrichment Word Problem

It takes Uranus 84 Earth years to orbit the Sun one time!

- ★ If you were 2 years old when Uranus started its orbit around the Sun, how old would you be when this orbit was completed?
- ★★ If you were 13 years old when Uranus started its orbit around the Sun, how old would you be when this orbit was complete?
- ★★★ How long would it take for Uranus to orbit the Sun 3 times?



URANUS

## HANDS ON ACTIVITY

# Icy Blue Process Art

Types of Learning: Experimenting, Creativity, Sensory Learning

## WHAT'S HAPPENING?

Uranus is the seventh planet from the Sun. It is more than twice as far from the Sun as Saturn. Uranus is an **ice giant** like its sister planet Neptune. Although it has a gas surface, like the gas giants Jupiter and Saturn, much of the interior of the planet is made up of frozen elements. As a result, Uranus has the coldest atmosphere of all the planets in the Solar System.

One of Uranus' most unique features is that it rotates on its side. If you picture the Sun and the planets of the Solar System on a table, the other planets would rotate or spin like tops. Uranus, on the other hand, would roll like a marble. Most scientists agree that Uranus' odd rotation is because another large planetoid object collided with the planet with enough force to change its tilt.

Also, Uranus' odd rotation in relation to the Sun gives it very different seasons. The Sun would shine on parts of Uranus for as long as 42 years and then it would be dark for 42 years.

*Adapted from Ducksters.*

[Check it out here for more interesting facts.](#)

## Materials

- Balloon
- Scissors
- Cookie sheet
- Blue paint
- Paintbrush

## Directions

This process art activity is a wonderful way to remember this icy, cold, blue planet!

1. Fill a balloon with water and freeze overnight.
2. Cut the balloon and peel it away revealing an icy round ball
3. Put that icy ball on a cookie sheet and get out the blue paint!
4. Try to paint an icy blue Uranus!





## TOPIC 9

# Neptune

Neptune is the eighth planet from the Sun, and is named after the Roman god of the sea. Like Uranus, it is an ice giant and also has a blue appearance from the methane in its atmosphere. However, scientists are baffled by how blue Neptune is, as it actually has less methane than Uranus. Let's explore...

### Spark Curiosity



Did you know? Mathematicians predicted that Neptune existed before it was directly observed in 1846.



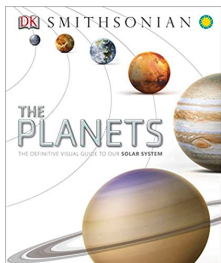
I wonder why Neptune is so blue?

### Resource Suggestions



**All About Neptune for Kids: Astronomy and Space for Children - FreeSchool**  
Free School

Neptune is the eighth and final planet in the Solar System. Neptune was the first planet to be discovered with math, and was the final objective of the Voyager 2 probe, which visited it in 1989.



**The Planets: The Definitive Visual Guide to Our Solar System**  
DK

Featuring all-new 3D models built using data gathered by NASA and the European Space Agency, The Planets is an awe-inspiring journey through the Solar System, from Earth to Mars and beyond.

### HANDS ON ACTIVITY

- "Playdough Moons" on page 25

### Literacy Enrichment Activity

Let's go on a letter scavenger hunt through our Solar System!

- ★ Write down the letters for the word "Neptune" on 7 small pieces of paper. Hide them throughout a room and have your child find those letters and put them in the correct order to spell Neptune!
- ★★ Write down each of the 8 planets on pieces of paper and hide them throughout a room. Have your child find those planet names and read them once found.
- ★★★ Write down each of the 8 planets on pieces of paper and hide them throughout a room. Have your child find those planet names, read them, and then place them in the correct order beginning with the planet closest to the Sun.





NEPTUNE

## HANDS ON ACTIVITY

# Playdough Moons

Types of Learning: Following Directions, Creativity, Sensory Learning

## WHAT'S HAPPENING?

Neptune has 14 moons, the largest of which is **Tritan** (named after the Greek god of the ocean). Tritan is a little bit smaller than Earth's moon and is covered in active volcanoes that erupt freezing cold nitrogen all over Tritan's surface.

Tritan is a strange moon, as it is the only large moon in our Solar System with a **retrograde orbit**. This means that it orbits in the opposite direction of Neptune's rotation. For this reason, scientists think that Tritan may have actually been a dwarf planet, but was captured by Neptune's gravitational pull.

*Adapted from Planets for Kids.*

[Check it out here for more interesting facts.](#)

## Materials

- Playdough
- Toothpicks

## Directions

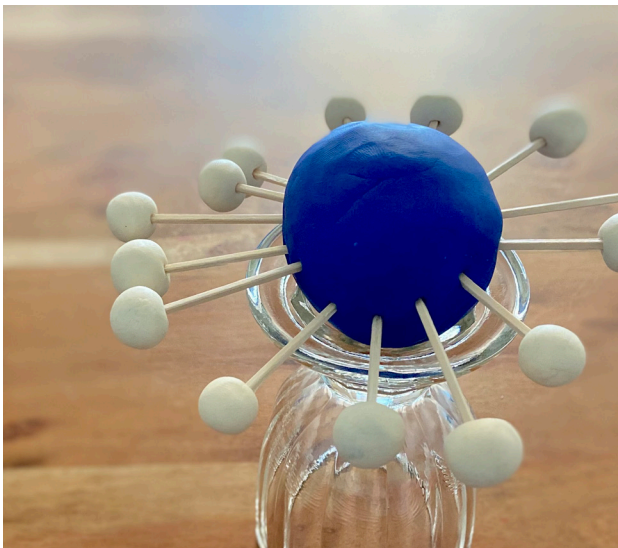
Today we will make Neptune and each of the 14 moons belonging to this planet (including Tritan!).

1. Make a batch of playdough, colouring half of it blue and leaving the other half un-coloured.
2. Roll the blue playdough to form a ball which represents Neptune.
3. Make 14 tiny balls out of the white playdough and stick them onto 14 toothpicks.
4. Insert these toothpicks into Neptune and you have created Neptune with its 14 moons!

## Playdough Recipe

This is the best playdough recipe, as even very little ones can help in almost the whole recipe. PLUS you can't mess it up! If it is too sticky – add more flour, too clumpy – add more boiled water.

1. Mix **1.5 cups flour**, **1/2 cup salt**, and **2 tsp cream of tartar** in a bowl. The order of ingredients doesn't matter – just pop it all in and stir!
1. Add in **1 cup boiling water** and **2 tbsp oil** and stir. You can add **food colouring** directly to the boiling water if you prefer for nice, easy colour mixing. Or if you want different colours, you can add the food colouring at the end into divided batches.
2. Knead a few times and it will become perfectly smooth. You can mix in some **essential oils** if you have any, or **vanilla**, or **cinnamon**.





## TOPIC 10

# Dwarf Planets

There are currently five official dwarf planets in our Solar System: Ceres, Pluto, Haumea, Makemake, and Eris. Another six objects are almost certainly dwarf planets, but are waiting for official classification, and there may be hundreds more dwarf planets in the Solar System. Let's explore...

### Spark Curiosity



Did you know? Pluto was reclassified from a planet to a dwarf planet in 2006.



What planet (or dwarf planet!) would you like to visit most if you could go anywhere in the Solar System?

### Resource Suggestions



#### Meet the 5 Dwarf Planets!

SciShow Kids

Jessi introduces you to some of the most newly-named members of the Solar System: the five dwarf planets!



#### A Place for Pluto

Stef Wade

Pluto got the shock of his life when he was kicked out of the famous nine. His planet status was stripped away, leaving him lost and confused. Poor Pluto! But when Pluto is about to give up, he runs into a dwarf planet and finally finds his place in the Solar System.

### HANDS ON ACTIVITY

- "My Dwarf Planet Book" on page 27

### Math Enrichment Word Problem

Pluto is about  $\frac{1}{6}$ th the width of Earth. If Earth were a nickel, Pluto would be the size of a pencil eraser.

- ★ How many Plutos placed side by side would it take to be the width of Earth?
- ★★ How many Plutos placed side by side would it take to be double the width of Earth?
- ★★★ If Pluto was twice its size, what fraction would it be compared to Earth?



## HANDS ON ACTIVITY

# My Dwarf Planet Book

Types of Learning: Creativity, Art, Research, Writing

## WHAT'S HAPPENING?

Dwarf planets are worlds that are too large to be considered asteroids, too small to be planets, and don't have all of the qualifications of a planet. A planet is a celestial body that:

1. Is in orbit around the Sun.
2. Has sufficient mass for self-gravity so it assumes a nearly spherical/round shape.
3. Has cleared the neighborhood around its orbit.
4. Isn't a satellite.

A dwarf planet is usually missing at least one of these characteristics, most often that it hasn't cleared the neighborhood around its orbit.

So far, astronomers have identified five dwarf planets in our Solar System: **Ceres**, **Pluto**, **Haumea**, **Makemake**, and **Eris**.

Ceres is located in the asteroid belt between Mars and Jupiter, and the rest of the dwarf planets are located in the outer Solar System in or near the Kuiper belt.

*Adapted from Planets for Kids.*

[Check it out here for more interesting facts.](#)

## Materials

- Markers or pencil crayons

## Directions



"My Dwarf Planet Book" on pages 28-33

For a long time, Pluto was the ninth planet in the Solar System, but now, it is classified as a Dwarf Planet – poor Pluto!

So, what makes a dwarf planet a dwarf planet? Read the "What's Happening" section and watch the video to find out.

1. Using the printable "My Dwarf Planet Book" on pages 28 to 33, make a dwarf planet book by and draw a picture of each of the five dwarf planets.
2. Write one interesting fact about each of the dwarf planets in your book.



CERES



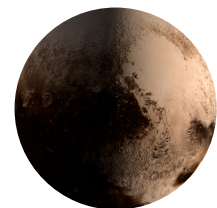
MAKEMAKE



HAUMEA



ERIS



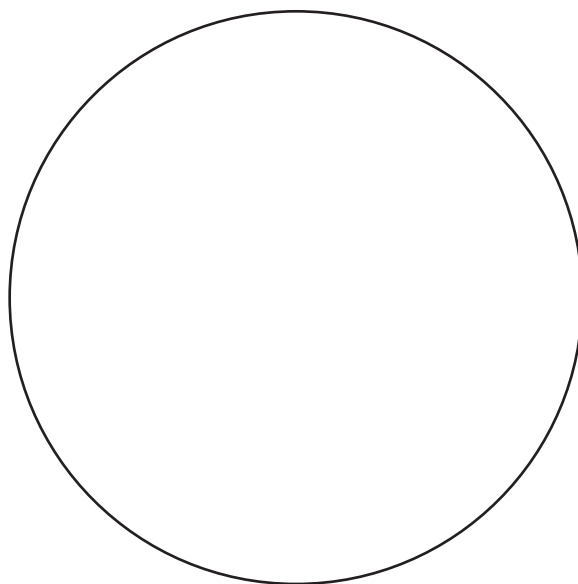
PLUTO



MY

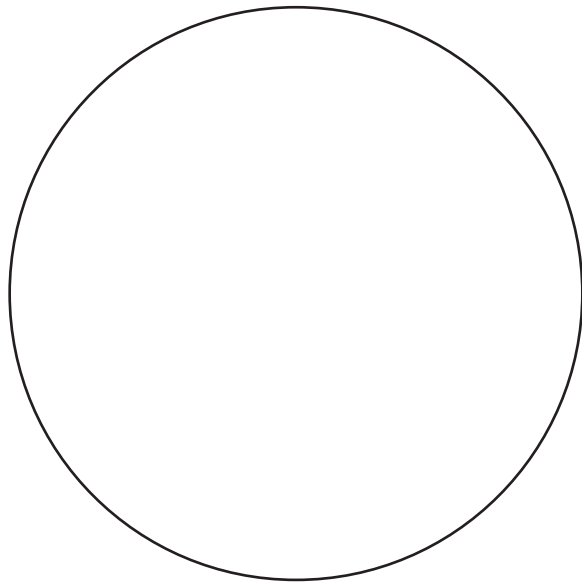


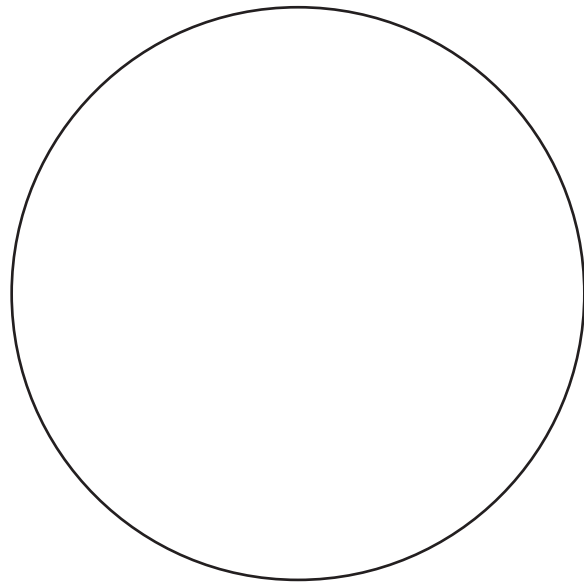
BOOK

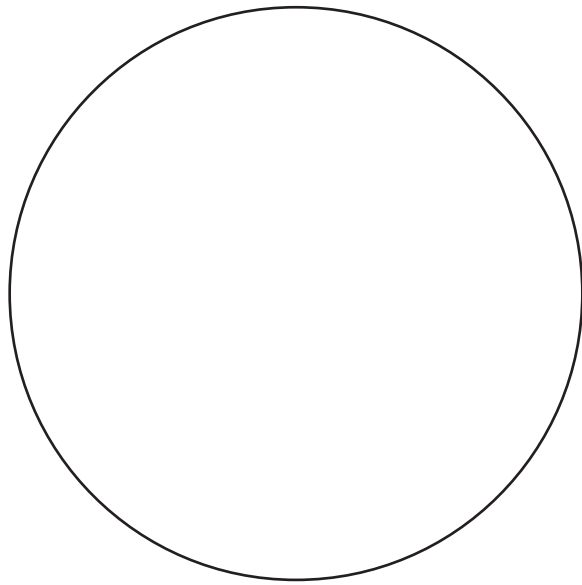


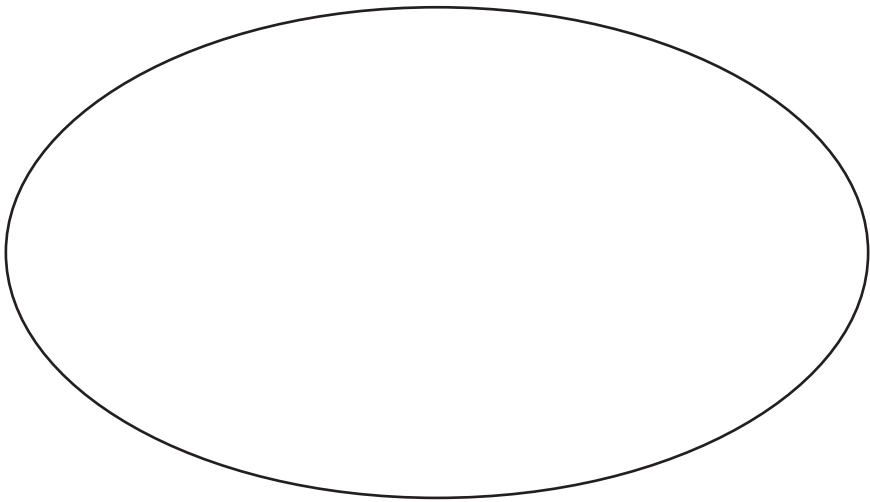
Written and illustrated by



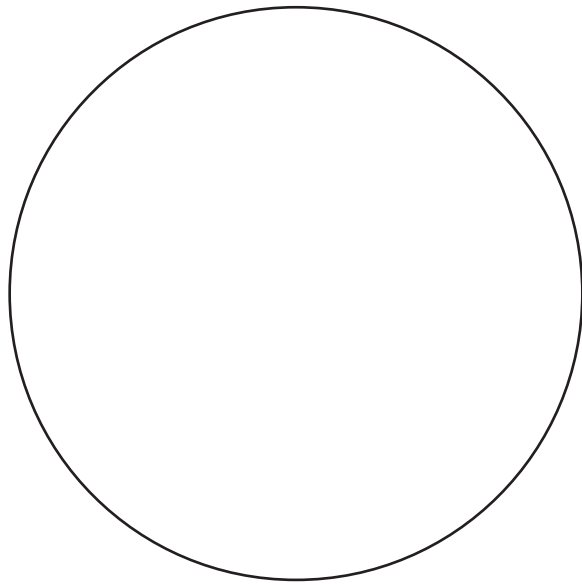
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This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface.

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My Unit Study Notes on The Solar System

TOPIC 1: THE SUN

TOPIC 2: MERCURY



My Unit Study Notes on The Solar System

TOPIC 3: VENUS

TOPIC 4: EARTH



My Unit Study Notes on The Solar System

TOPIC 5: MARS

TOPIC 6: JUPITER



My Unit Study Notes on The Solar System

TOPIC 7: SATURN

TOPIC 8: URANUS



My Unit Study Notes on The Solar System

TOPIC 9: NEPTUNE

TOPIC 10: DWARF PLANETS