



# Preview - Information



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# Google Slides Lessons Preview





# Alberta Science Curriculum Space Unit – Grade 4

## 3-Part Lesson Format

### Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Quotes
- And More!

### 01 What Is The Universe?

#### Learning Goal

We are learning to understand what the universe is and what it includes so we can clearly explain how planets, stars, galaxies, and space are connected and organized.



### Matching Activity: Objects In The Universe

(Drag each description to the correct system)



Object in the Universe	Description
Galaxy	
Planet	
Star	
Solar System	
Natural Satellite	
Meteor	

A system that includes the Sun, planets, and other space objects

A group of billions of stars, gas, and dust held together by gravity

A small rocky object that burns as it enters a planet's atmosphere

A large object that orbits a star and does not make its own light

A hot, glowing ball of gas that gives off its own light

An object that orbits a planet, like a moon

### Part 2 – Action!

- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

### Part 3 – Consolidation!

- Exit Cards
- Quizzes
- Reflection
- And More!

### Consolidation – 3-2-1 Reflection Activity

After learning about the universe and the different objects found in space, reflect on the following:

- 3 things you learned about galaxies, stars, or planets.
- 2 things you found interesting about how our solar system is part of the Milky Way Galaxy.
- 1 question you still have about celestial bodies in the universe.

Write your responses in your notebook or discuss with a partner. If short on time, share your answers as a whole-class activity.



Consolidation



# Alberta Science Curriculum Space Unit - Grade 4

**Solar System - Multiple Choice**  
Write the correct letter (A, B, or C) in the Answer column

Question	A	B	C	Answer
1) What is at the center of our solar system?	Earth	The Sun	Neptune	
2) How old is the solar system?	4.6 billion years	460 years	46 million years	
3) Which planet is the largest?	Mars	Earth	Jupiter	
4) What force keeps planets in orbit around the Sun?	Gravity	Heat	Wind	
5) Which planet is closest to the Sun?	Mercury	Earth	Neptune	
6) What is an orbit?	A type of star	A repeating path around the Sun	A bright flash in space	

**Learning About Earth's Movement**  
Check True Or False For Each Statement Based On What You Learned.

1) A moon is a natural object that orbits a planet.	True/False
2) Most moons do not make their own light.	
3) Scientists believe Earth's moon formed after a collision.	
4) All moons have air that humans can breathe.	
5) Moons can be different sizes and shapes.	
6) Humans have landed on several different moons.	
7) Every planet in our solar system has at least one moon.	
8) Some moons may have hidden oceans under their surface.	
9) Moons orbit the Sun instead of planets.	
10) Studying moons helps scientists learn more about space.	

**W**

Telescope	Hubble
Planetarium	Planets
Stars	Moon
Galaxies	Space
Orbit	Observatory
Astronomer	Satellite
Universe	

Word search grid:

K X A S T R O N O M E  
I V V V R O X X B C P K K G V B  
J L Q O S W O N A E L C K A F A S  
S X W G Z H F R T X A N M L G N E  
I E R C S S D I B Y N K E A S E R  
B Q H U B B L E Z I E W V X T T V  
K G C R P L H R M P T P H I A A A  
U N I V E R S E K O S N V E R R T  
R W B T T E L E S C O P E S S I O  
S P A C E A H A P W O N B P L U R  
L S B I N O C U L A R S T T P M Y



# Alberta Science Curriculum Space Unit - Grade 4

**Safe Sun Viewing - Multiple Choice**  
Write the correct letter (A, B, or C) in the Answer column

Question	A	B	C	Answer
1) Why is it unsafe to look directly at the Sun?	It moves across the sky	It gives off very strong light	It looks small from Earth	
2) Which item is safe for viewing the Sun?	Binoculars	Regular sunglasses	Solar viewing glasses	
3) What part of sunlight can harm our eyes?	Ultraviolet (UV) light	Wind	Clouds	
4) Why are regular sunglasses not safe for Sun viewing?	They change colours	They are uncomfortable	They do not block enough light	
5) What can happen if UV light enters your eyes?	Eyes adjust safely	Eyes become stronger	Vision can be damaged	
6) What is a safe way to observe the Sun without looking at it?	Looking quickly	Using a pinhole projector	Closing one eye	

**Check True Or False For Each Statement**

1) A constellation is a pattern of stars seen from Earth.	
2) Stars in a constellation are close together in space.	
3) Some constellations helped people travel at night.	
4) People long ago used constellations to tell stories.	
5) Constellations help organize the night sky.	
6) Every culture names constellations the same way.	
7) Constellations change shape quickly each night.	
8) The same stars can be part of different constellations.	
9) Constellations are used to measure exact star distances.	
10) There are many recognized constellations in the sky.	

True      False

**Effect**

A. Scientists can predict sunrise, sunset, and seasons.
B. Stars appear to move across the night sky.
C. Some places have daylight while others have darkness.
D. One full year passes as Earth completes its path.
E. Day and night happen again and again.
F. We see different constellations in different seasons.
G. The sky looks different at different times of night.



# Workbook Preview



## Grade 4 – Science Unit

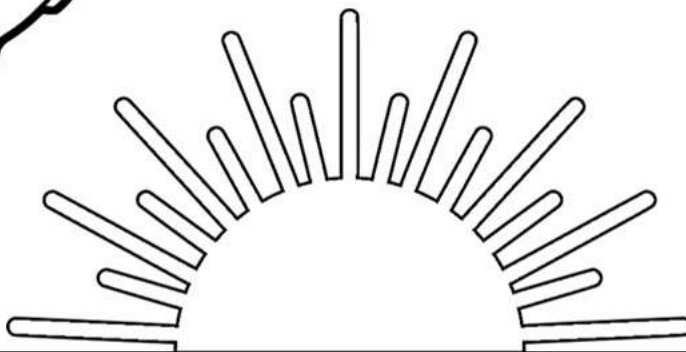
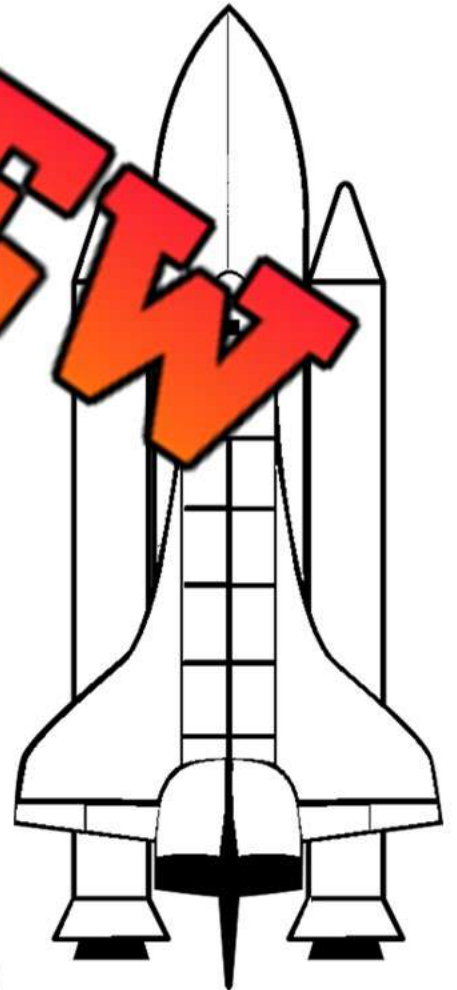
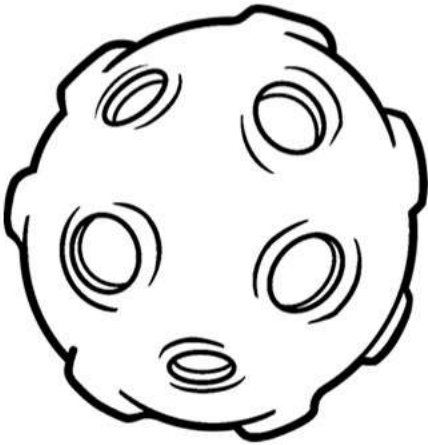
Organizing Idea: Space: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.

Guiding Question: How do objects in space impact daily life?

	<b>Learning Outcome</b> - Students investigate and describe objects in space in connection to daily life.	<b>Pages</b>
<b>S4.1</b>	The universe includes all of space and everything in it. Objects in space include the Moon, the Sun (a star), stars and their planets, planets and their moons	7-23
<b>S4.2</b>	Most objects in space are more easily observed at night	24-25
<b>S4.3</b>	Technologies for viewing objects in space include binoculars	26-30
<b>S4.4</b>	<h1 style="color: red; margin: 0;">Preview of 75 pages from this product that contains 132 pages total.</h1>	
<b>S4.5</b>		
<b>S4.6</b>		
<b>S4.7</b>		
<b>S4.7</b>	Earth's daily rotation and yearly revolution around the Sun causes the constellations to appear in different locations at different times.	40-44
<b>S4.8</b>	Polaris, the North Star, shows the approximate direction of the North Pole. The Orion constellation can be used to find the South Pole	45-46
<b>S4.9</b>	The Moon has been used throughout history to measure time. Some cultures may use a lunar calendar in addition to the international standard calendar.  Lunar calendars follow patterns of the Moon for timekeeping.	60-79
<b>S4.10</b>	The international standard (Gregorian) calendar is based on the amount of time it takes Earth to revolve around the Sun.  Most people follow the international standard calendar in daily life.	80-84
<b>Computer Science</b>		
<b>CS.1</b>	Students examine and apply design processes to meet needs.	54-59, 85-86

NAME: \_\_\_\_\_

# Space



# The Universe

## What is the Universe?

The **universe** is everything we can touch, feel, sense, measure, and detect. This means it is everything that is living, planets, galaxies, dust clouds, light, and even time.



Planet



Star

Before the universe was created, time, space, and matter did not exist.

## What is a Galaxy?

A **galaxy** is a massive collection of gas, dust, and billions of stars and their solar systems, all held together by gravity.



Natural Satellite

We live on the planet Earth, which is part of our solar system. Our solar system has eight planets and is only one part of the **Milky Way Galaxy**. When we look up at night and see the stars, we are seeing stars in the Milky Way. Scientists estimate that the Milky Way has 400 billion stars. Most of these stars have at least one planet orbiting them. In our solar system, the sun is the star and the eight planets orbit around it.

## The Universe – An Unimaginably Large Entity

This picture was taken by the Hubble Space Telescope. It shows thousands of galaxies as each of the tiny dots are galaxies.



Each galaxy has upwards of 400 billion solar systems.

Our solar system has 8 planets and one Sun, which means our

Milky Way Galaxy could have upwards of 3.2 trillion planets and 400 billion Suns.

It is also estimated that there are approximately 2 trillion galaxies that we can see from our planet. That's a lot of stars, solar systems and planets!

The universe is home to many celestial bodies. A **celestial body** is an object in space. Celestial bodies include stars, planets, natural satellites (moons), comets, asteroids, galaxies, and meteors or meteorites.



Meteor

**Questions**

Answer the questions below using evidence from the text

1) What is the difference between a solar system and a galaxy?

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2) How big is the Universe? Explain using the terms: galaxies, stars, and solar systems.

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**Visualizing**

Draw what you saw in the picture you were reading. Explain the picture

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**True or False**

Circle whether the statement is true or false

1. Galaxies are larger than the Universe	True	False
2. A galaxy can have upwards of 400 billion solar systems	True	False
3. A solar system has 100 billion planets in it	True	False
4. The universe has around 2 trillion galaxies	True	False
5. There could be 3.2 trillion planets in our galaxy	True	False

## Solar System – Size, Structure, Age

### What is a Solar System?

Our **solar system** is the collection of eight planets and their moons in orbit around the Sun. It also includes the smaller bodies in the form of asteroids and comets.

### Age of the Solar System

Our solar system was formed 4.6 billion years ago. It is believed that 4.6 billion years ago, gravity pulled a

cloud of dust and gas together to form a protostar. The massive concentration of dust and gas created a molecular cloud that could eventually form the Sun. With the birth of the Sun, the planets began to form 100 million years around it.

### Size and Structure of the Solar System

The image above shows the size and structure of our solar system. As you can see, the size of the Earth is small compared to the size of Jupiter, Saturn and Uranus.

The furthest object that we can see in our solar system is Sedna, which is 143.73 billion km away from the Sun. This means the diameter of the solar system is 287.46 billion km.

There are eight planets in our solar system and one sun that each planet orbits around. An **orbit** is a regular, repeating path that one object takes around another. Therefore, all the planets orbit the Sun, as they all travel in a circle around the Sun. Since planets are further away from the Sun, it takes them longer. In fact, it takes Neptune 165 years to orbit the Sun once! Earth orbits the Sun every 365 days. Earth is the 3<sup>rd</sup> planet from the Sun, or some refer to it as the 3<sup>rd</sup> rock from the Sun.



**Questions** Answer the questions below using evidence from the text

1) What is our solar system? When was it formed?

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2) What is the size of our solar system? Did anything surprise you about the size of the planets?

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**Questioning** Write 3 questions about the reading

1)

2)

3)

**True or False** Is the statement true or false?

1) The Sun orbits around the planets	True	False
2) All the planets orbit the Sun every 365 days	True	False
3) The Sun is the largest object in our solar system	True	False
4) The Earth orbits the Sun every 365 days	True	False
5) Our solar system was formed 4.6 billion years ago	True	False

## Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: \_\_\_\_\_

Mark

Is the statement true (T) or false (F)?

1) The Sun is older than every planet in the solar system.	T
	F
2) A planet's orbit changes shape based on its size.	T
	F
3) Sedna marks the smallest distance in the solar system.	T
	F
4) Earth takes longer than Venus to travel once around the Sun.	T
	F

Name: \_\_\_\_\_

Mark

Is the statement true (T) or false (F)?

1) The Sun is older than every planet in the solar system.	T
	F
2) A planet's orbit changes shape based on its size.	T
	F
3) Sedna marks the smallest distance in the solar system.	T
	F
4) Earth takes longer than Venus to travel once around the Sun.	T
	F

Name: \_\_\_\_\_

Mark

Is the statement true (T) or false (F)?

1) The Sun is older than every planet in the solar system.	T
	F
2) A planet's orbit changes shape based on its size.	T
	F
3) Sedna marks the smallest distance in the solar system.	T
	F
4) Earth takes longer than Venus to travel once around the Sun.	T
	F

Name: \_\_\_\_\_

Mark

Is the statement true (T) or false (F)?

1) The Sun is older than every planet in the solar system.	T
	F
2) A planet's orbit changes shape based on its size.	T
	F
3) Sedna marks the smallest distance in the solar system.	T
	F
4) Earth takes longer than Venus to travel once around the Sun.	T
	F

Name: \_\_\_\_\_

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# Diagram of our Solar System

Diagram of our Solar System

Label the solar system using the word bank

## Word Bank

Mercury

Uranus

Earth

Jupiter

Saturn

Neptune

Mars

Venus

Sun



# What are Moons?

## What are Moons?

**Moons** are natural objects that orbit planets. Scientists call moons “natural satellites” because a satellite also orbits a planet. Most people think satellites are just machines we send into space to orbit a planet, but satellites can be natural too.

Planets and asteroids orbit the Sun, but moons orbit planets. Moons come in different shapes and sizes and are made of rock. Most moons are airless, but some have atmospheres and even hidden oceans. We know a lot more about the moon because in 1969, the American astronauts landed on the moon and took rock samples back to Earth to study them.

## Moons and Planets

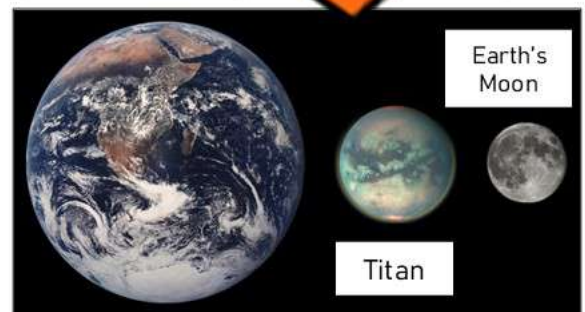
The Earth has one moon that orbits around it. There are 214 moons in our solar system. Most of the moons orbit around Jupiter, Uranus and Saturn. Smaller planets usually have less moons, Mars has two, Venus and Mercury don't have any. Although scientists aren't 100 percent sure, they believe Jupiter has 79 moons.

It was discovered in 2019, that Saturn has 20 new moons that scientists didn't know about. This gives Saturn a total of 82 moons. Saturn's biggest moon “Titan” is larger than the planet Mercury! Check out the size comparison in the photo below. The planet Uranus is larger than Titan, but Titan is larger than our moon.

The Earth's moon can be seen by us each evening on a clear night, but it's really far away! It is 384,399 kilometres from the Earth! It took the American astronauts 3 days travelling at an average speed of 3,280 kph.

## How was Earth's Moon Formed?

There are many theories that try to explain how the moon was formed. No one knows for sure! The most accepted theory is that the moon formed when the Earth and another small planet collided. The debris from the collision began to orbit the Earth. Over time, the debris collected to form a moon.



**Questions**

Answer the questions below using evidence from the text

1) What are moons? Do all planets have moons?

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2) How was Earth's moon formed?

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**Summarize**

What is the main idea and supporting details

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**True or False**

Circle whether the statement is true or false

1. Moons are natural satellites because they orbit planets	True	False
2. Moons orbit around the Sun, not around planets	True	False
3. Scientists know exactly how many moons there are in our solar system	True	False
4. Most moons have atmospheres (air) and oceans	True	False
5. Moons are made of rock materials	True	False

## Moons in our Solar System

### Moons in our Solar System

There are over 200 different moons in our solar system. Many of these moons are similar, but some are different. Research 4 different moons from 4 different planets, and write about what is known about these moons (what it's made of, size, atmosphere, oceans, etc.)

#### Research


Learn more about some of the moons in our solar system

Moon's Name	Planet the Moon belongs to	Draw the Moon	Information (atmosphere, volcanos, oceans, size, temperature, etc.)

**PREVIEW**

**Research**

Learn more about some of the moons in our solar system

Moon's Name	Planet the Moon Belongs to	Draw the Moon	Information (atmosphere, volcanos, oceans, size, temperature, etc.)
			

# Planetary Systems In Space

## What are Planetary Systems?

A planetary system is a group of celestial bodies, including a star and everything that orbits it. Here are some key points:

- The star acts like the parent of the family. Its gravity makes the other bodies orbit it.
- Planets are like the star's kids, and they travel around the star in paths called orbits.
- Some planets have moons, which are smaller bodies that orbit the planets.

## The TRAPPIST-1 System: A Closer Look

TRAPPIST-1 is a solar system located about 40 light-years away from us (it takes 40 years for light to travel there!) What makes it so special? Find out!

### The Star: TRAPPIST-1

At the center of this system is the star TRAPPIST-1. It's a lot smaller and cooler than our Sun. In fact, it's called an "ultra-cool dwarf" star.

### The Planets

TRAPPIST-1 is famous for its seven Earth-sized planets. These planets are TRAPPIST-1b, 1c, 1d, 1e, 1f, 1g, and 1h. Here are some fun facts:

- All 7 planets are a similar size to Earth. They could have rocky surfaces just like ours!
- Three of the planets (1e, 1f, and 1g) are in the "habitable zone." This means they could potentially have liquid water on their surfaces.
- The planets are so close to each other that if you stood on one of them, you could see some of the other planets in the sky, just like we see the Moon from Earth!

### Other Features

- The TRAPPIST-1 system is too far away for us to know if it has moons or comets. But, astronomers are using powerful telescopes to learn more about it every day.



**Questions** Answer the questions below using evidence from the text

1) Why is the star important in a planetary system?

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2) What is special about the planets in the TRAPPIST-1 system? Write 3 things.

1)

2)

3)

**Draw** Draw your own drawing of TRAPPIST-1 with the information you have

**Multiple Choice** Circle the correct answer

1) Is TRAPPIST-1 a star or planet?	Star	Planet
2) How many planets does TRAPPIST-1 have?	7	8
3) Is TRAPPIST-1 bigger or smaller than our Sun?	Bigger	Smaller
4) Are all seven TRAPPIST-1 planets in the habitable zone?	Yes	No
5) Is our Solar System a planetary system?	Yes	No

# Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class

Name: \_\_\_\_\_

Mark

Circle the correct answer.

1) What is at the centre of TRAPPIST-1?	Star
	Planet
2) What keeps the planets moving around TRAPPIST-1?	Gravity
	Wind
3) How many planets orbit TRAPPIST-1?	Three
	Seven
4) What tool do astronomers use to study TRAPPIST-1?	Microscopes
	Telescopes

Name: \_\_\_\_\_

Mark

Circle the correct answer.

1) What is at the centre of TRAPPIST-1?	Star
	Planet
2) What keeps the planets moving around TRAPPIST-1?	Gravity
	Wind
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Name: \_\_\_\_\_

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Circle the correct answer.

1) What is at the centre of TRAPPIST-1?	Star
	Planet
2) What keeps the planets moving around TRAPPIST-1?	Gravity
	Wind
3) How many planets orbit TRAPPIST-1?	Three
	Seven
4) What tool do astronomers use to study TRAPPIST-1?	Microscopes
	Telescopes

## Activity: Galaxy in a Bottle

### Objective

What are we learning more about?

To help students understand the vastness and diversity of the universe in a fun and creative way.

### Materials

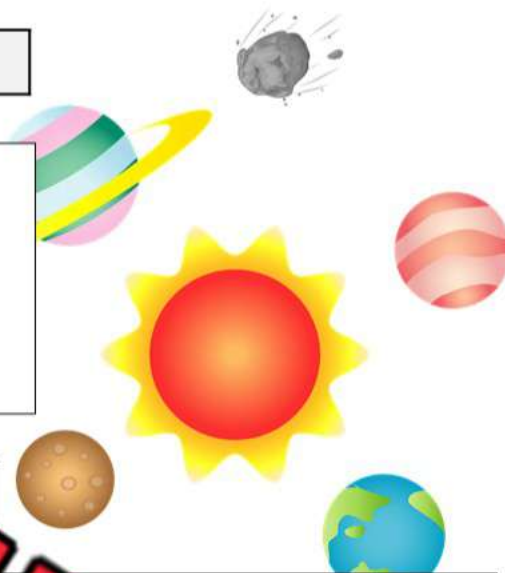
What do we need for our experiment?

- ✓ Clear plastic bottle with a cap
- ✓ Different colored glitter (each color represents a different element or celestial body in the universe)
- ✓ Cotton balls
- ✓ Water
- ✓ Food coloring (optional)

### Procedure

How do we create the galaxy?

- 1) First, talk to the students about the universe and show them pictures of stars, galaxies, and different elements. Explain how each color of glitter represents a different element or type of celestial body, for instance blue for water, gold for planets, and silver for asteroids.
- 2) Take the clear bottle and add a bit of water just to wet the cotton balls.
- 3) Stretch out some cotton balls and push them into the bottle until the bottle is covered.
- 4) Sprinkle the first color of glitter on top of the cotton balls. This represents one element or celestial body in the universe.
- 5) Add another layer of cotton balls, pressing down so that the glitter gets encased between the layers. This is to show how the universe is layered.
- 6) Repeat the process with different colors of glitter and more cotton, creating multiple layers in the bottle.
- 7) Once the bottle is full, put the cap on tightly. Now you have your own little universe!
- 8) Students can shake the bottle to see how the "universe" changes, just like our actual universe is always in motion.



**Observations**

What do you see?

1) Can you see individual "stars" or "planets" or do they all blend together?

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2) How does the look of your galaxy change when you hold it up to the light?

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**Results**

Answer the questions below

1) How is our actual universe similar to your galaxy in a bottle?

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2) Order the space components in order from smallest to larger:

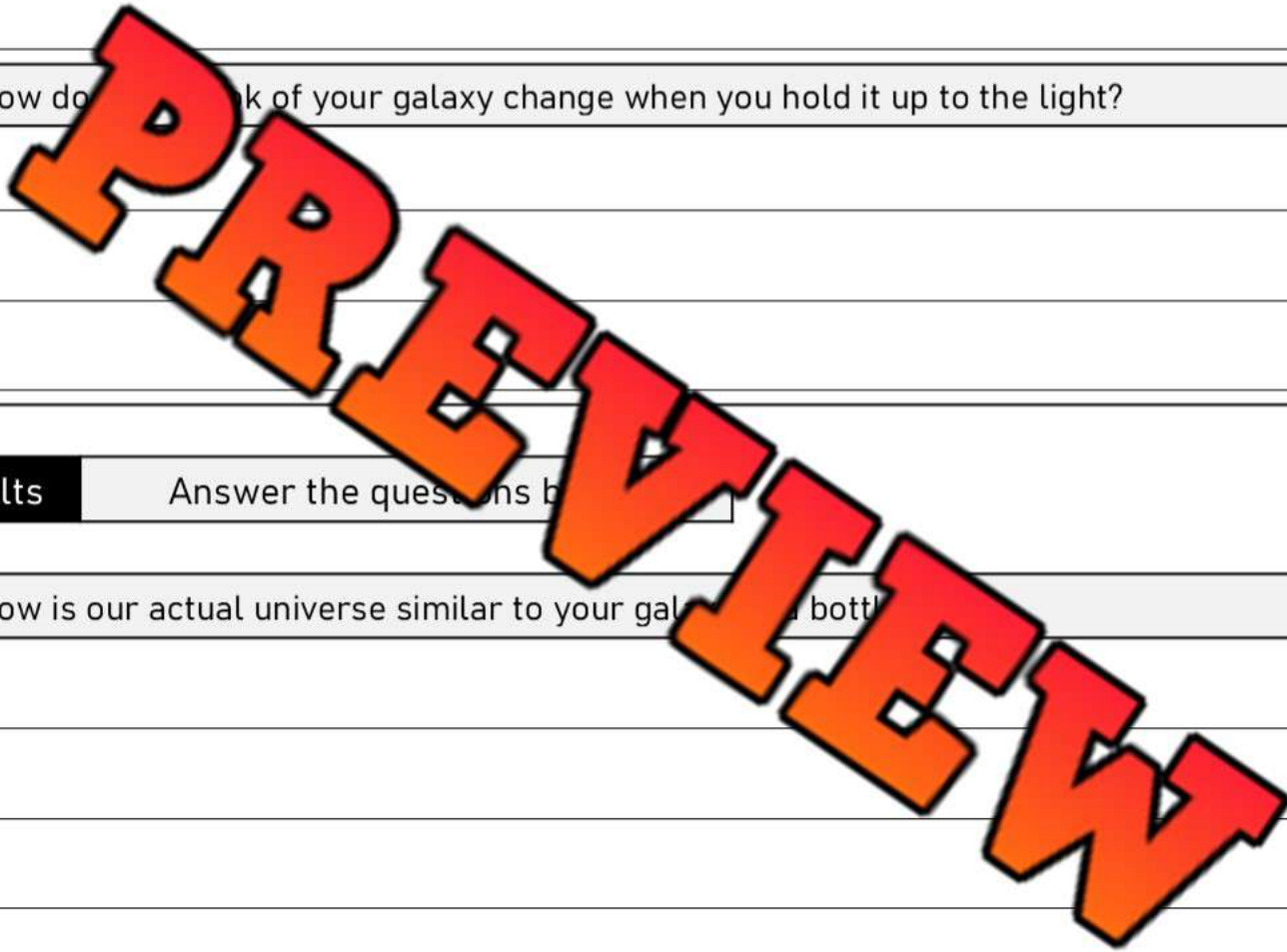
Planets      Galaxies      Stars      Solar System      Moons      Universe

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**Questions**

Answer the questions below using evidence from the text

1) Why are most objects in space easier to observe at night?

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2) What is skyglow and how does it affect our observation of space objects?

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**Making Connections**

Are we able to see space objects during the day? How about at night? Explain.

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**True or False**

Is the statement true or false?

1) The Sun outshines most objects in the sky.	True	False
2) We can only see space objects during the day.	True	False
3) Skyglow is caused by natural light.	True	False
4) Planets like Mars can be seen at night.	True	False
5) We can see galaxies at night with a telescope.	True	False

## Technologies for Viewing Space

### Technologies for Viewing Objects in Space

Welcome to our report about the exciting technologies used for observing objects in space. We will talk about three main tools - binoculars, telescopes, and planetariums. These are instruments that astronomers, scientists, and even everyday people use to explore the wonders of our universe.

#### Telescopes

Telescopes make things look closer and bigger. They can show more details and see farther than binoculars. They come in different sizes, from ones you can use in your backyard to big ones that observe things even in space like the Hubble telescope. With a telescope, you can see things like Jupiter's craters, Saturn's rings, far galaxies, and nebulae (clouds of dust and gas in space).

#### Binoculars

Binoculars are like two small telescopes that you hold up to your eyes. They're often the first thing beginners use to look at space. They're easy to use, cheap, and you can carry them around. You can see the moon, planets like Jupiter and Saturn, and even faraway star groups and galaxies with them.

#### Planetariums

A planetarium is a special room where you can see pictures of the night sky on a big dome ceiling. They use high-tech projectors to display images of the night sky onto a dome overhead. They simulate the motion of the stars and planets to recreate the sky at any point in time. Planetariums are great for people to learn about the objects in the sky without needing their own viewing equipment.



**Explain**

Describe the technologies below

Telescope	
Binoculars	
Planetarium	

**Making Connections**

How are you connected to any of these technologies?

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**True or False**

Is the statement true or false?

1) Binoculars are like small telescopes.	True	False
2) You can't see planets with binoculars.	True	False
3) All telescopes are the same size.	True	False
4) Telescopes can see farther than binoculars.	True	False
5) A planetarium shows a live view of the actual night sky.	True	False

# Hubble Telescope

## What is the Hubble Telescope?

The Hubble Telescope is a big telescope that's not on Earth, but in space! It was named after a famous scientist named Edwin Hubble.

## Why is Hubble Special?

The Hubble Telescope is special because it's above the Earth's atmosphere. This means it can see things that telescopes on Earth can't. It can take really clear pictures of stars, galaxies, and planets.

## How Hubble Works

The Hubble Telescope gets power from the sun through two solar panels. It can't go wherever it wants in space. It has to stay in a path called an orbit. It's about 550 kilometres above Earth. That's higher than any airplane can fly!

People on Earth control Hubble. They use computers to tell Hubble where to look and when to take pictures. Then Hubble sends the pictures back to Earth so scientists can study them. So even though Hubble is very far away, it's always connected to us here on Earth.

## What Has Hubble Seen?

Hubble has seen a lot of amazing things. It has looked at faraway galaxies, bright stars, and even the birth and death of stars. It has also taken pictures of planets in our solar system.

## Cool Facts About Hubble

- It was launched into space in 1990.
- Hubble has traveled more than 4 billion miles in space!
- Hubble doesn't need a driver, it is controlled by people on Earth.



**Think**

Write 5 things you learned about the Hubble Telescope

1)	
2)	
3)	
4)	
5)	

**Draw**

Draw the Hubble Telescope

**True or False**

Is the statement true or false?

1) The Hubble Telescope is on Earth.	True	False
2) Hubble was named after a scientist.	True	False
3) Hubble can see better than Earth telescopes.	True	False
4) Hubble gets power from the moon.	True	False
5) Hubble can go anywhere in space.	True	False

# Safe Sun Viewing

## Looking at the Sun Safely

The Sun gives us light and warmth. But, did you know looking directly at the Sun can hurt your eyes? It's so bright that it can cause damage. But don't worry! We can still observe the Sun safely with the right tools and rules.

## Why We Can't Look at the Sun

The Sun is really bright, but it is extremely bright. It's so bright that our eyes can't handle the Sun's light. It gives us a lot of light, including types we can't see like ultraviolet (UV) light. This light is really harmful. If it gets into our eyes, it can hurt them.

It's like how your skin can get sunburned if you stay outside too long without sunscreen. Your eyes can get sunburned, too. This is not like a normal burn. It can cause a lot of pain and even make you lose your vision. That's why it's very important not to look directly at the Sun, especially without protection.

## Using Safety Equipment

Special equipment is needed to look at the Sun. One of these tools is "solar viewing glasses." These glasses have super dark lenses that protect your eyes. You can't use regular sunglasses because they don't block enough sunlight.

Another way to look at the Sun safely is by using a "pinhole projector." It's something you can make yourself. It lets you see the Sun without looking at it directly.

## Following Safety Rules

- 1) Never look directly at the Sun, even if the Sun doesn't seem very bright
- 2) Only use safe equipment. Regular sunglasses or binoculars are not safe



**Questions**

Answer the questions below using evidence from the text

1) Why can looking directly at the Sun hurt your eyes?

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2) What special equipment can we use to look at the Sun safely?

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**Making Connections**

What does the text remind you of?

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**True or False**

Is the statement true or false?

1) We can't see ultraviolet light.	True	False
2) Regular sunglasses are safe for Sun viewing.	True	False
3) Our eyes can get "sunburned" by the Sun.	True	False
4) Binoculars are safe for looking at the Sun.	True	False
5) It's safe to look at the Sun if it doesn't seem bright.	True	False

# Experiment – Pinhole Projector

## Objective

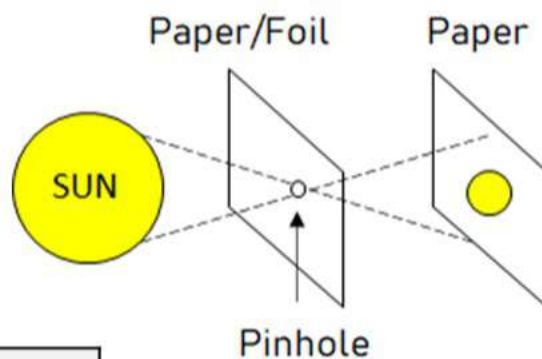
What are we learning about?

To create a simple pinhole projector that allows you to safely observe the Sun.

## Materials

What do we need for our experiment?

- 1) Two pieces of cardboard
- 2) A small piece of aluminum foil
- 3) A pin
- 4) A pin



## Method

How do we do our experiment?

- 1) Prepare the Projector: Start by taking one piece of the cardboard. In the center of this cardboard, cut a small square that measures about 1x1 inches.
- 2) Create the Pinhole: Next, take a small piece of aluminum foil and cut it so it's just a bit larger than the hole you've cut in the cardboard. Then, place the piece of aluminum foil securely over the square hole. Ensure it's flat and covers the hole completely.
- 3) Make the Pinhole: Now, it's time to make the actual pinhole. Take the pin and fully poke a tiny hole right in the center of the aluminum foil.
- 4) Set Up for Viewing: To use your pinhole projector, first make sure your back is towards the Sun. You should be facing away from the Sun, not towards it.
- 5) Position the Projector: Hold the piece of cardboard with the foil above your shoulder or to your side. Make sure the Sun is shining directly onto the foil side of the cardboard.
- 6) Position the Screen: Hold the second piece of cardboard (this will be your screen) in front of you, in the shadow of the first cardboard piece.
- 7) Observe: You should see a small, round, bright spot of light appear on the second piece of cardboard. This is the projected image of the Sun. Adjust the distance between the two pieces of cardboard to focus the image.

**Observations**

What do you see?

1) Describe what you saw using your projection. Explain the shape and colour.

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2) What happens to the shape of the Sun's projection if you move the second piece of cardboard closer or further away?

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**Results**

Answer the questions below

1) Why is the projection of the Sun the shape that it is?

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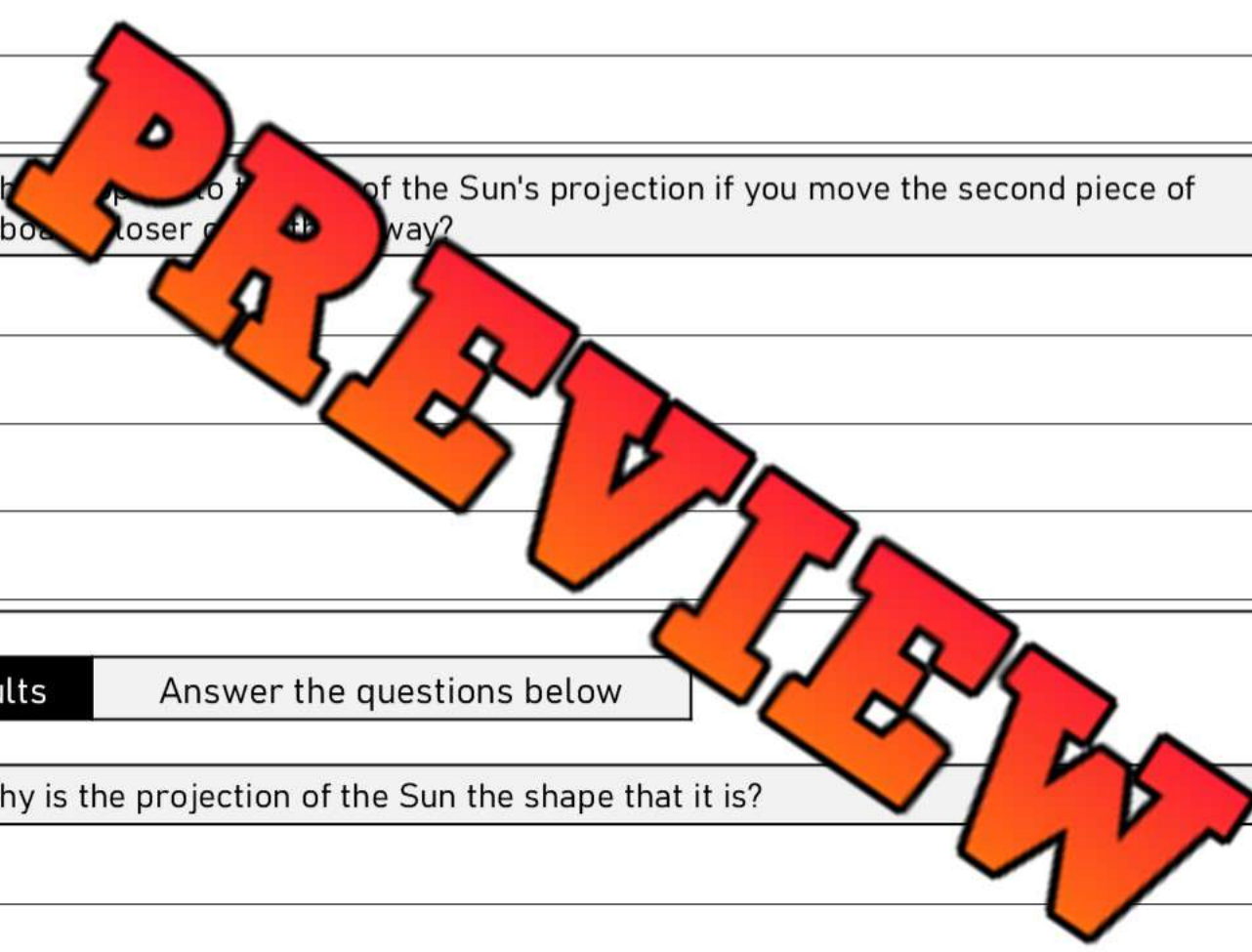
2) Why can you look at the projection of the Sun, but not directly at the Sun itself?

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## Celestial Object in the Night Sky

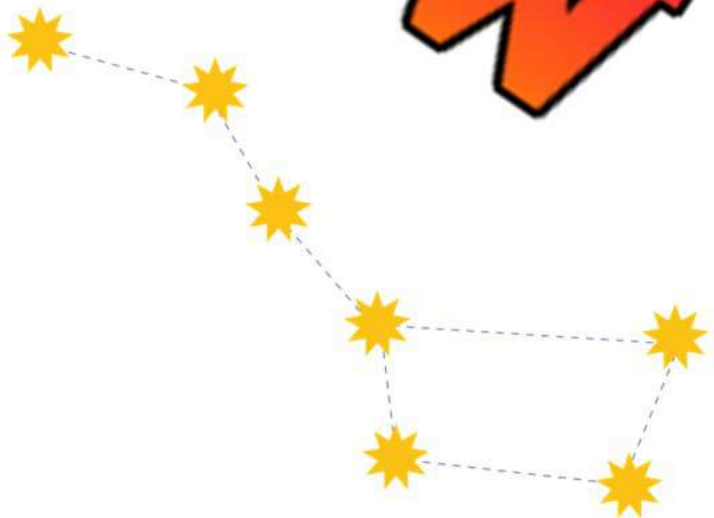
### What is a Celestial Object?

A **celestial object** is a natural object which is located outside of the Earth's atmosphere. The Moon, the Sun, an asteroid, planet or star are all examples of celestial objects.

We can see the same celestial objects in our night sky, between sunset and sunrise. If the sky is clear with no clouds, many celestial objects can be seen with an unaided eye, binoculars or telescope. Sometimes, we can only see certain celestial objects during certain times of the year. This is because we are orbiting the Sun and other planets are also orbiting the Sun. We are travelling at different speeds, but these speeds, orbits, and rotations are predictable. This gives scientists the ability to understand when certain celestial objects will be visible in the night sky.

### List of Celestial Objects We Can See

- **The Moon** – Can be observed most of the time if the sky is clear.
- **Jupiter** – Jupiter is the largest planet in our solar system and is very bright and exciting to observe. It is best observed just hours before sunrise because the visibility of it lessens when the sky gets brighter.
- **The 5 Visible Planets** – the five planets that are closest to the Sun are the ones that can be easily seen in the night sky with the naked eye. These planets from closest to the Sun are – Mercury, Venus, (Earth), Mars, Jupiter, Saturn. With a telescope, you can see dynamic features like Jupiter's cloud belts, Saturn's rings and Mars' ice caps.
- **The Big Dipper** – The best known constellation - collection of stars that consists of seven stars.



**Questions**

Answer the questions below using evidence from the text

1) Why are some celestial bodies only visible during certain times of the year?

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2) Why is Saturn visible? When should we look to see Jupiter?

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**Making Connections**

Can you see a celestial body? Explain.

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**True or False**

Is the statement true or false?

1. The Earth is a celestial body	True	False
2. The Big Dipper is a collection of 7 stars	True	False
3. Uranus is part of the 5 visible planets	True	False
4. Jupiter can be seen with the naked eye	True	False
5. We see stars and planets randomly on random days throughout the year	True	False

## What Are Constellations?

### What Are Constellations?

When you look up at the night sky, you can see a lot of stars. A constellation is a group of stars that make a special shape. People long ago started noticing these shapes in the stars and gave them names. It's kind of like a big dot-to-dot in the sky!

### Where Do Constellation Names Come From?

The names of constellations come from many different places. Many constellations have names from ancient stories called myths. These myths were told by people like the Greeks and Romans. For example, the constellation Orion was named after a great hunter in Greek mythology.

But not all constellation names are from old stories. Some constellations have names that come from the shape they make in the sky. For example, "Ursa Major" means "Big Bear" and "Ursa Minor" means "Little Bear" because people thought these constellations looked like bears.

### Are Stars in a Constellation Close Together?

When you look at a constellation, you might think the stars are close to each other. But, that's not true! Stars in the same constellation can be very far away from each other, even millions of kilometers apart. They only seem to be close together because we are so far away from them.

### Cool Facts About Constellations

- There are 88 recognized constellations.
- Different cultures around the world have different constellations.
- Constellations can help us know which way is north or south.



**Questions**

Answer the questions below using evidence from the text

1) What are constellations?

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2) Are the stars in a constellation close together? Explain why they look close.

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**Draw**

Draw the two constellations Ursa Major and Ursa Minor

Ursa Major	Ursa Minor

**Multiple Choice**

Circle the correct answer

1) What is a constellation?	Shape	Star
2) Where do constellations get their names from?	Scientists	Stories
3) What does "Orion" represent in mythology?	Hunter	Bear
4) "Ursa Major" means what in English?	Little Bear	Big Bear
5) What makes stars in a constellation seem close together?	Size	Distance

# Earth's Movements and the Changing Sky

## Earth's Daily Spin

Every day, Earth spins around in a circle. We call this spin "rotation." It's why we have day and night. When your part of Earth is facing the Sun, it's daytime for you. When your part of Earth is facing away from the Sun, it's nighttime.

## ROTATION VS REVOLUTION



**24 / 1**  
HOURS / DAY



**365 / 1**  
DAYS / YEAR



## How Rotation Changes the Sky

The spinning Earth makes the stars appear to move in the sky. As Earth spins, different stars come into view. That's why the night sky changes over the course of the year. It isn't that the stars are moving. Instead, it is us spinning that allows us to see different stars in the sky.

## Earth's Yearly Journey Around the Sun

But Earth doesn't just spin. It also moves around the Sun in a circle. This movement is called "revolution." It takes a year for Earth to complete one full revolution around the Sun.

## How Revolution Changes the Constellations We See

This yearly journey changes the night sky too. As Earth moves around the Sun, the nighttime side of Earth faces different directions in space. That means we get to see different stars at different times of the year.

### Summer Constellations:

- 1) Cygnus (The Swan)
- 2) Lyra (The Lyre)
- 3) Aquila (The Eagle)
- 4) Sagittarius (The Archer)
- 5) Scorpius (The Scorpion)

### Winter Constellations:

- 1) Orion (The Hunter)
- 2) Taurus (The Bull)
- 3) Gemini (The Twins)
- 4) Canis Major (The Greater Dog)
- 5) Cassiopeia (The Seated Queen)

**Questions**

Answer the questions below using evidence from the text

1) Explain how Earth's rotation causes us to see different stars at night.

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2) Why do we see different constellations at different times of the year?

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**Draw**

Draw your own diagram of how the Earth moves

Earth's Rotation	Earth's Revolution Around the Sun

**Multiple Choice**

Circle the correct answer

1) What is Earth's daily spin called?	Rotation	Revolution
2) Why do we have day and night?	Rotation	Revolution
3) Do stars move in the sky?	Yes	No
4) What is Earth's yearly journey around the Sun called?	Rotation	Revolution
5) Why do we see different stars at different times of the year?	Rotation	Revolution

# Exit Cards

**Cut Out** Cut out the exit cards below and have students complete them at the end of class

Name: \_\_\_\_\_

Match each term to what it means.

Rotation	<input type="checkbox"/>	<input type="checkbox"/>	Earth moving around the Sun
Revolution	<input type="checkbox"/>	<input type="checkbox"/>	Earth spinning in place

Name: \_\_\_\_\_

Match each term to what it means.

Rotation	<input type="checkbox"/>	<input type="checkbox"/>	Earth moving around the Sun
Revolution	<input type="checkbox"/>	<input type="checkbox"/>	Earth spinning in place

Name: \_\_\_\_\_

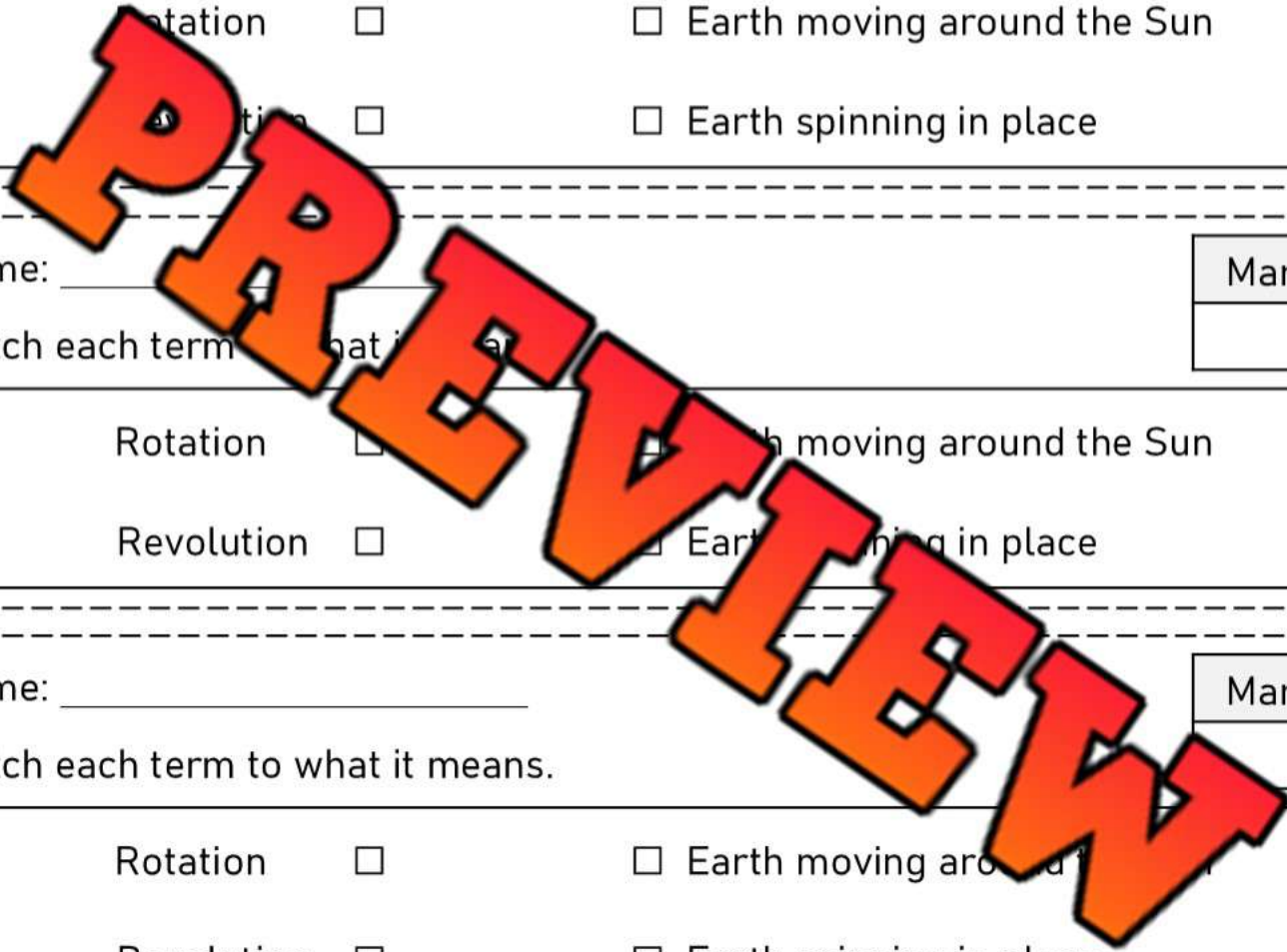
Match each term to what it means.

Rotation	<input type="checkbox"/>	<input type="checkbox"/>	Earth moving around the Sun
Revolution	<input type="checkbox"/>	<input type="checkbox"/>	Earth spinning in place

Name: \_\_\_\_\_

Match each term to what it means.

Rotation	<input type="checkbox"/>	<input type="checkbox"/>	Earth moving around the Sun
Revolution	<input type="checkbox"/>	<input type="checkbox"/>	Earth spinning in place

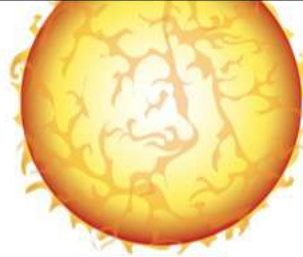


## Experiment – Rotating Earth

### Research Question

Why do we have day and night?

Why do we have a day with light and a night with no light?



### Materials

What do we need for our experiment?

- 1) Globe
- 2) Lamp or small flashlight
- 3) Dark room



### Method

How do we complete the experiment?

- 1) Take the lamp shade off the lamp
- 2) Put the globe about 20 centimetres away from the light
- 3) Point the globe so that Canada is being lit up. Notice that the rest of the world are dark while Canada is light.
- 4) Spin the globe slowly. Notice if some parts are now a bit lit up and some places are now in the dark.
- 5) Keep spinning the globe until Canada is now in the dark. Which countries are now lit up?
- 6) Now switch the position of the lamp and the globe. Notice when you repeat the steps above that Canada is either further or closer to the Sun. This creates our seasons.





## Observations

Answer the questions below

1) When it is light in Canada, which countries are in the dark?

1)

2)

3)

4)

5)

2) When Canada is positioned so that it points closer to the Sun, which season is it?

Summer

Winter

Spring

3) When Canada is positioned so that it points further from the Sun, which season is it?

Summer

Winter

Fall

4) Why do we have seasons? Describe the relative locations of the Sun and the Earth during each season.

Summer

Fall

Winter

Spring

## Using Stars to Find Our Way

### Using Stars for Navigation

For a long time, people have used stars to find their way.

This is called navigation. Before we had compasses or GPS, sailors would look at the stars to figure out where they were. The North Star was like their compass, always pointing them North.

### Orion, the South Star

If you're in the Southern Hemisphere, you can use the Orion constellation to help find your way. Orion is easy to find because it has a pattern of stars that look like a hunter. If you draw an imaginary line through Orion's belt, this line points to the North Star.

### Polaris, the North Star

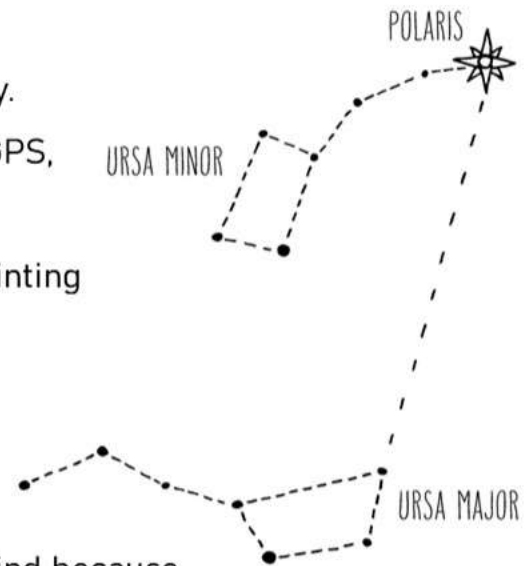
There is a special star in the sky that always points to the North, called Polaris, or the North Star. It's not the brightest star, but it has a special place in the sky. Where you are, if you can find Polaris, you can find North. This is because Polaris is located almost directly above the North Pole of the Earth.

### Local Names for the North Star

Different cultures and people have given the North Star their own special names. In Canada, many Indigenous groups have their own unique names about this star.

For example, the Inuit people refer to the North Star as "Niqirtsuituq." It means "the one that never moves." It describes the North Star's special position in the sky, always in the north, unmoving.

The Cree people call the North Star "Atchakos Iskwew," which means "Star Woman." This name comes from a story about a woman who travelled to the sky and became a star.



**Questions**

Answer the questions below using evidence from the text

1) How does the North Star help people find their way?

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2) Do all groups of people call the North Star the same name? Explain.

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**Draw**

Draw the Plow and Ursa Major/Ursa Minor


**Multiple Choice**

Circle the correct answer

1) Which hemisphere can Orion be seen in?	Northern	Southern
2) Which star can show us which direction is south?	Orion	Polaris
3) Is Polaris the brightest star in the sky?	Yes	No
4) Does the North Star move in the sky?	Yes	No
5) Which constellation is Polaris part of?	Ursa Major	Ursa Minor

# Constellations

## What are Constellations?

A **constellation** is a group of visible stars that we can see from Earth. A constellation forms a pattern that often takes the shape of an animal, mythological creature, a man, a woman, or an inanimate object like a compass, microscope, or crown.

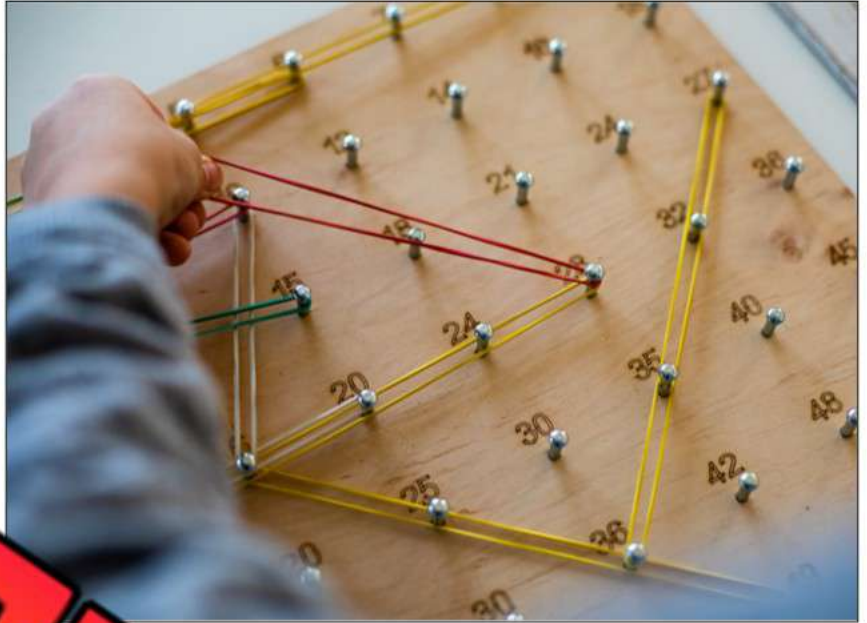
## Research

Learn more about the major constellations. Draw a picture and write down interesting information you learned about the constellation.

Constellation	Drawing	Information
The Big Dipper		<hr/> <hr/> <hr/> <hr/>
The Little Dipper		<hr/> <hr/> <hr/> <hr/>
Orion		<hr/> <hr/> <hr/> <hr/>
Taurus		<hr/> <hr/> <hr/> <hr/>
Gemini		<hr/> <hr/> <hr/> <hr/>

## Experiment – Geoboard Constellations

Use a geoboard to represent 4 constellations. You can research your own, or choose from the options provided. Once you've created your geoboard constellation, draw it using dot paper.



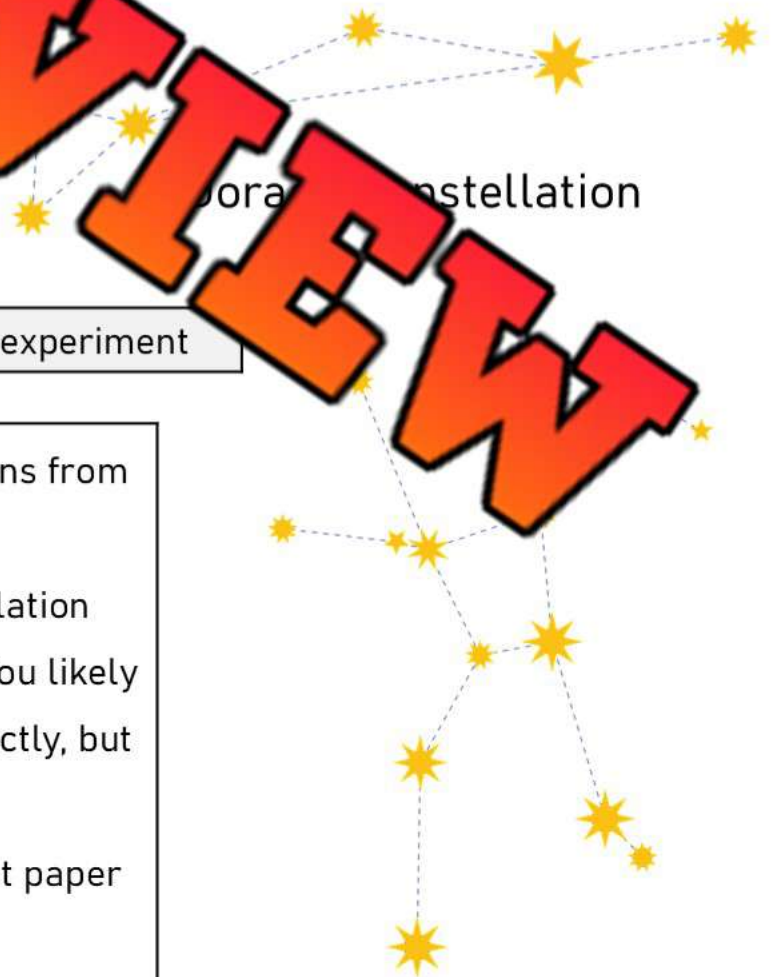
### Materials

- Paper with dot paper
- Geoboard
- Elastics
- Constellations

### Procedure

How you perform the experiment

- 1) Research or choose 4 constellations from the options provided to you
- 2) One at a time, represent a constellation using elastics on the geoboards. You likely won't be able to represent it perfectly, but do your best!
- 3) Draw each constellation on the dot paper before moving on to the next constellation



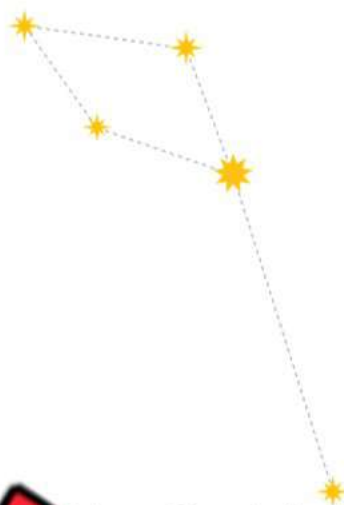
Hercules Constellation

Examples

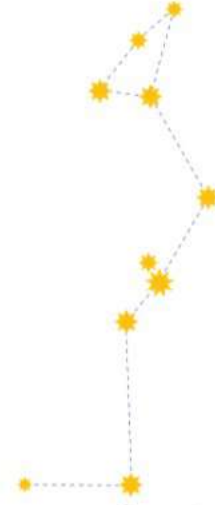
Below are some examples of constellations you can use



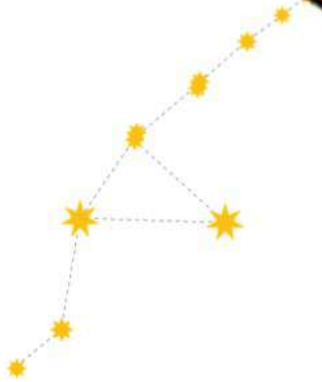
Draco Constellation



Ursinus Constellation



Serpens Constellation



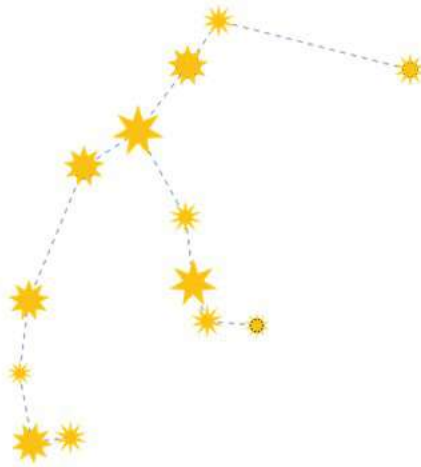
Grus Constellation



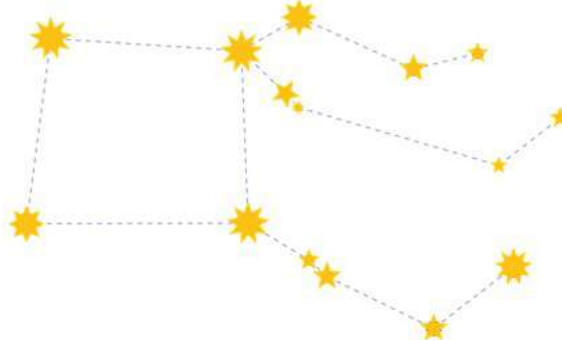
Triangulum Constellation



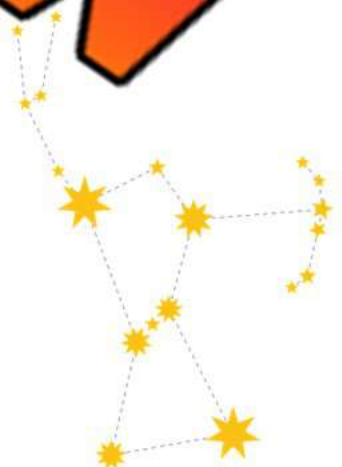
Scorpio Constellation



Perseus Constellation



Pegasus Constellation




Orion Constellation

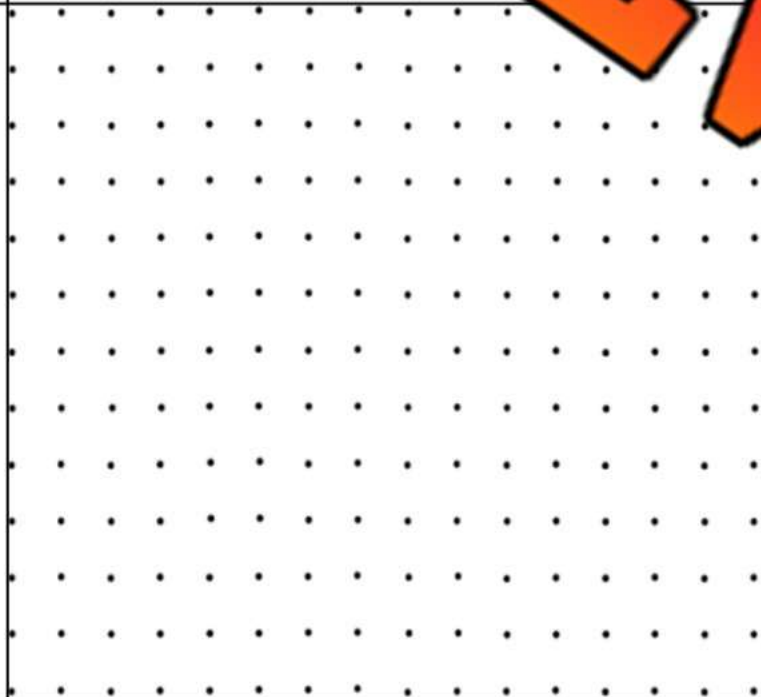
**PREVIEW**

# Experiment – Geoboard Constellations

**Draw**

Draw each constellation you decide to represent on your geoboard

Constellation Name	Drawing	How Many Stars
		

Constellation Name	Drawing	How Many Stars
		

**PREVIEW**

## Indigenous Constellation Story - Great Bear Hunt

Many Indigenous groups, including the Cree, Mi'kmaq, Haudenosaunee, and Haida share a story relating to the Big Dipper constellation.

### The Great Bear Hunt

It is about a huge bear called Mista Muskwa, who roamed over the lands. All living things were afraid because it was big, mean and powerful.

One day, seven birds decided to meet and plan to get rid of the bear. Some of the best hunters were chosen to move to the north.

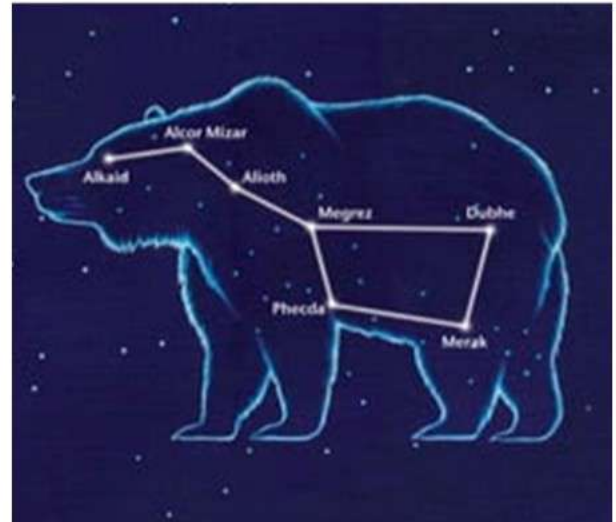
The best hunters and birds were the Robin, Chickadee, Moose-bird, Blue Jay, Pigeon, Horned Owl and Screech Owl.

The ravens did not like the plan. They liked the bear because they followed it around and ate the bear's left-overs. So, the ravens decided to tell Mista Muskwa about the plan to get rid of him.

Mista Muskwa was mad when he found out. He found the hunters and birds and to scare them. But, when the hunters were not afraid, the bear turned around. This is what bullies do when confronted.

As he left, the hunters attacked and left Mista Muskwa bleeding. Mista Muskwa shook off the blood, like a wet dog shakes off water. As he did, the blood landed on the earth and painted the leaves red. That is why the leaves change colours in the fall season.

As he shook, he also splattered a drop of blood on the Robin's chest. Now, all robins have a red chest. To remind us all about bullies, Mista Muskwa was placed in the sky along with seven birds.



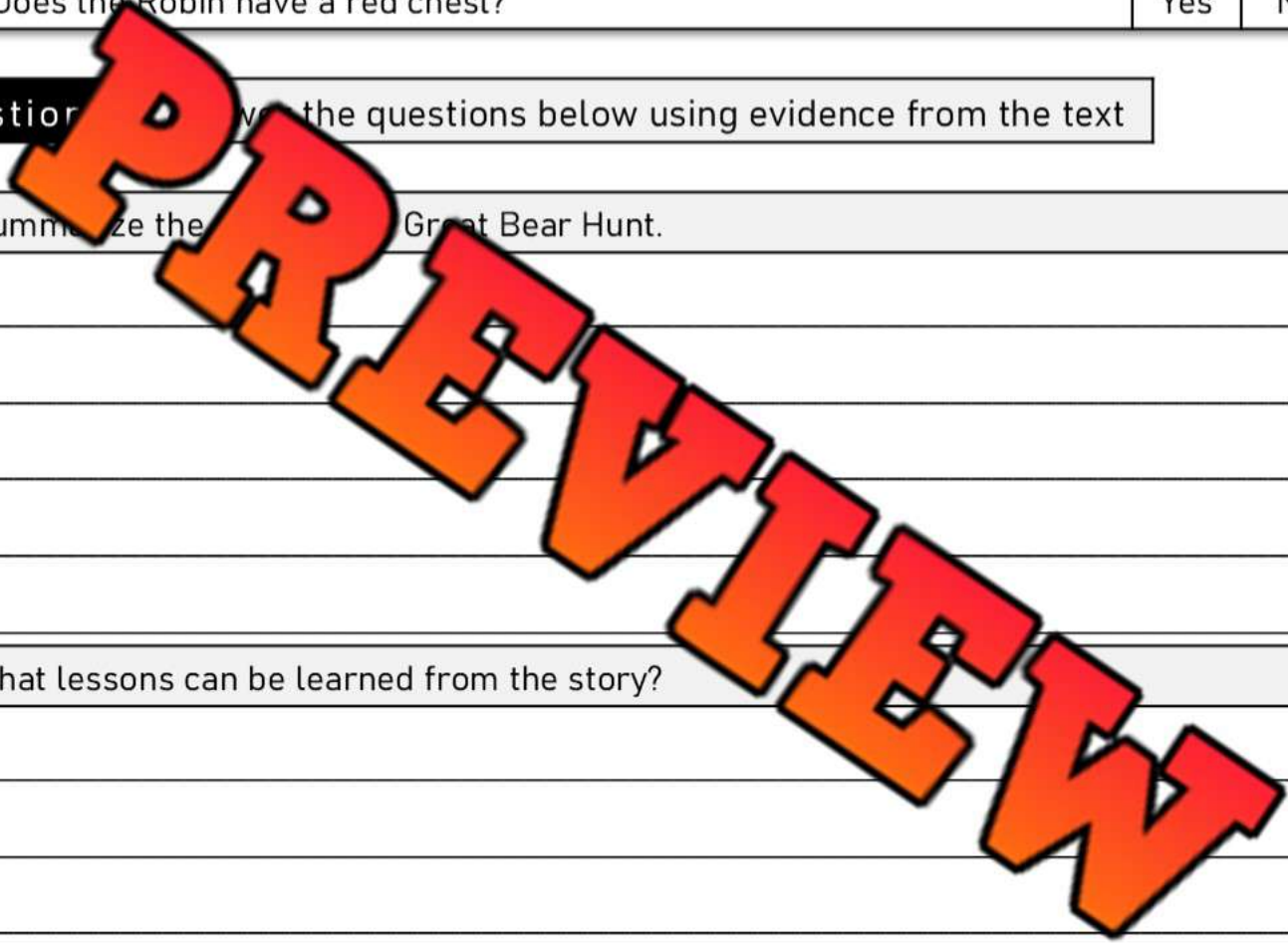
**Yes/No** Is the answer to the question yes or no?

1) Do constellations tell a story to the First People?	Yes	No
2) Was Mista Muskwa a nice and kind bear?	Yes	No
3) Did the ravens want to protect Mista Muska?	Yes	No
4) Were the hunters who stopped Mista Muskwa the biggest animals?	Yes	No
5) Does the Robin have a red chest?	Yes	No

**Question** Answer the questions below using evidence from the text

1) Summarize the Great Bear Hunt.

2) What lessons can be learned from the story?



**Making Connections** What does this story remind you of?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

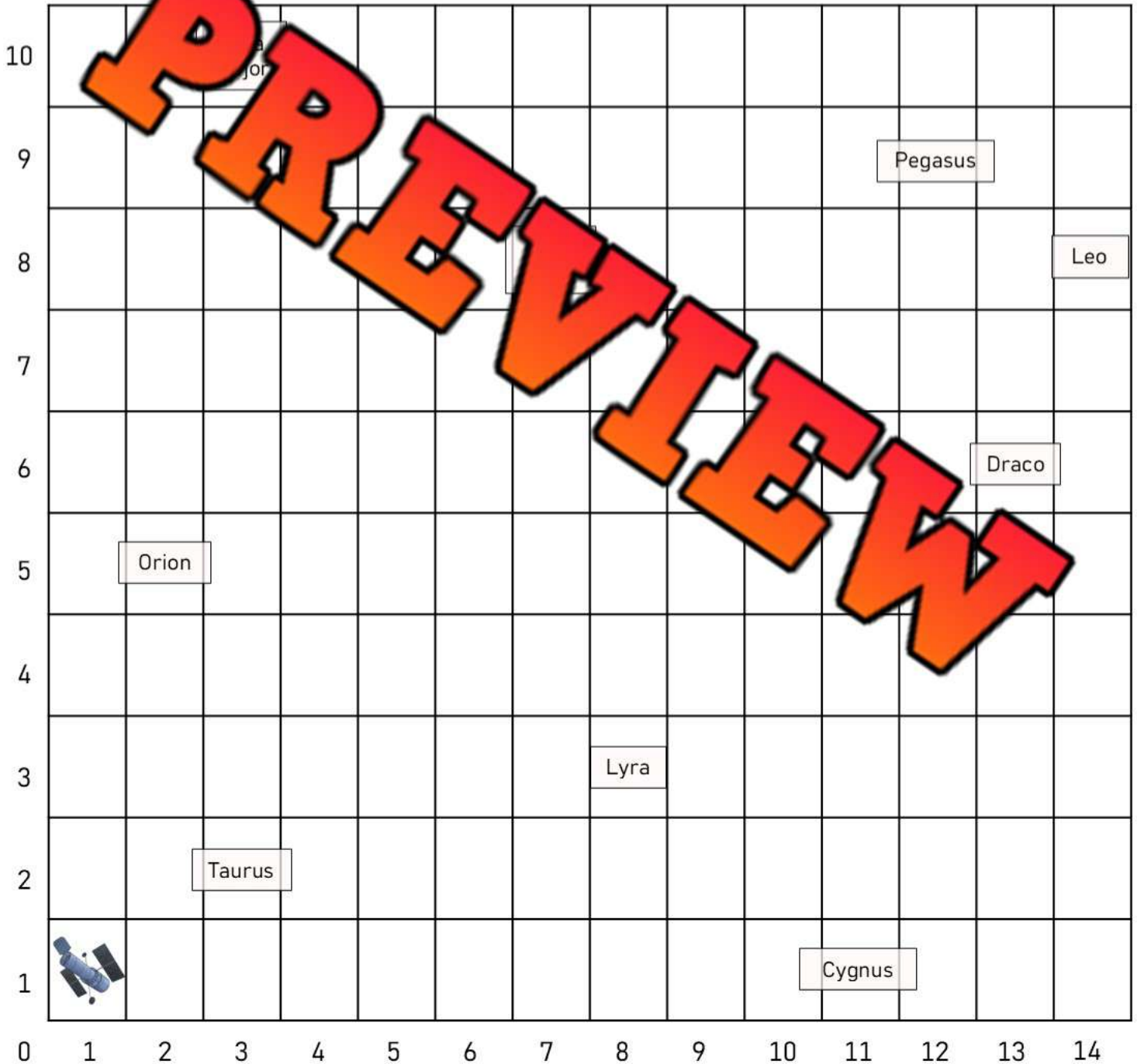
\_\_\_\_\_

# Coding - Hubble Telescope And Constellations

The map below shows where certain constellations can be found. The Hubble Telescope is controlled by humans on Earth, but we need to tell it where to look. Use the map to move the Hubble Telescope to where it needs to be pointed.

## Mapping

Use this map to write the code on the next page





# STEM Assignment - Designing a Space Telescope

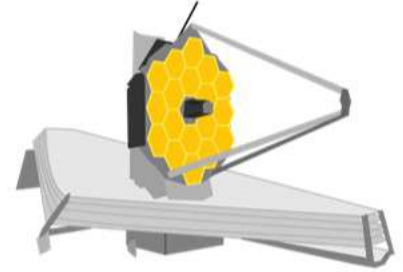
Create your own telescope that can see deep into space.

What tools does your telescope need?

- Solar panels, lenses, engine so it can move, propeller, antenna to communicate with Earth, etc.

What is your telescope capable of doing?

- Can it go anywhere in space, or does it orbit?
- Can it move quickly?
- Can it take pictures?
- Does it have a magnification allowing it to see living things?



What was your telescope designed to do?

- Will it check for life on other planets?
- Will it look for planets that may be habitable?

## Questions

Answer the questions about your telescope below

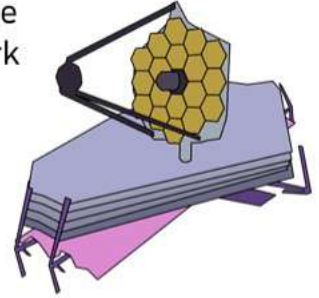
1) What is the name of your telescope?

2) What tools will your telescope have?

3) What is your telescope capable of doing?

4) What will your telescope be designed to do? What is the goal of using the telescope?

Write simple If/Then statements so that the controller of the telescope can send instructions for the telescope to follow. For example, to work a movement of the telescope, the code could look like this.



If the left arrow button is pressed

THEN turn left

**IF/THEN** Write code for each tool that your telescope has so that you can control the tools

**PREVIEW**

If \_\_\_\_\_  
THEN \_\_\_\_\_

If \_\_\_\_\_  
THEN \_\_\_\_\_

If \_\_\_\_\_  
THEN \_\_\_\_\_

If \_\_\_\_\_  
THEN \_\_\_\_\_

If \_\_\_\_\_  
THEN \_\_\_\_\_

If \_\_\_\_\_  
THEN \_\_\_\_\_

If \_\_\_\_\_  
THEN \_\_\_\_\_

Name: \_\_\_\_\_

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Curriculum Connection  
CS.1

Draw

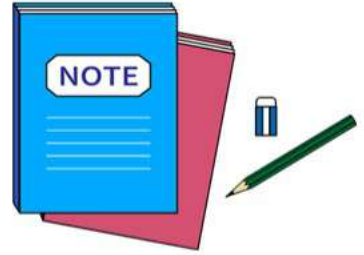
Draw your telescope. Make sure it has the tools you included in your plan

**PREVIEW**

Name: \_\_\_\_\_

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Your space telescope has just been launched. You are at the controls. What did you discover on your first three days? Write down your observations in your journal entries below.



**Journal**

Write your three journal entries below

Day 1 - Journal Entry

**PREVIEW**

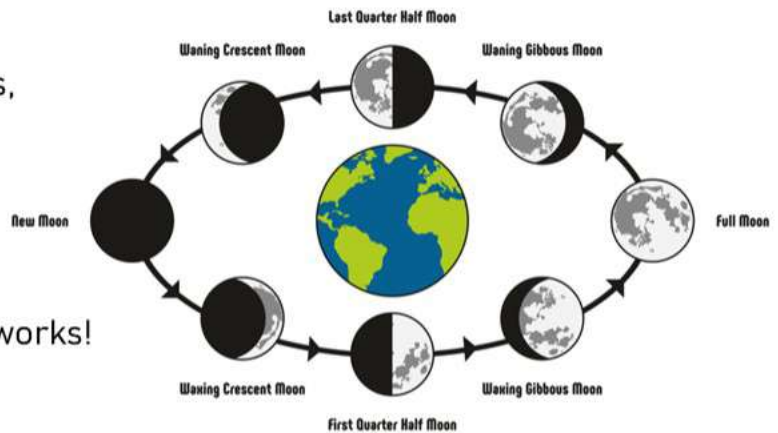
Day 2 - Journal Entry

Day 3 - Journal Entry

## Measuring Time Using The Moon

### The Moon: Our Ancient Calendar

Long before we had clocks or calendars, people kept track of time by looking at the Moon. The Moon has been used to measure time for thousands of years. Learn more about how this works!



### Moon Phases

Have you ever noticed that the Moon looks different at different times? Sometimes it's full and round, and other times it's just a thin crescent. These are what we call the Moon's "phases." The Moon goes through a set of phases every month, from a New Moon (when it looks like there's no Moon at all) to a Full Moon and back again.

### Using the Moon to Measure Time

Because the Moon's phases repeat about every month, people used them to measure time. This is where the word "month" comes from! It comes from the word "month," which means the amount of time it takes for the Moon to go through all of its phases. This takes about 29.5 days, but we round it up to 30 or 31 days for our calendars.

### Lunar Calendars

Some cultures even created lunar calendars based on the Moon's cycles. For example, the Haida calendar uses the phases of the Moon to measure time. Each new month begins with the sighting of the New Moon.

### The Moon's Impact Today

Even today, the Moon still helps us keep track of time. We divide the year into 12 months, which roughly lines up with the number of times the Moon orbits Earth in a year. The Moon's phases can also help farmers know the best time to plant crops.

**Questions**

Answer the questions below using evidence from the text

1) Explain in your own words how the Moon was used to measure time.

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2) Why is the word "month" based on the Moon?

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**Questioning**

Write 3 questions you have about the reading

1)	
2)	
3)	

**Multiple Choice**

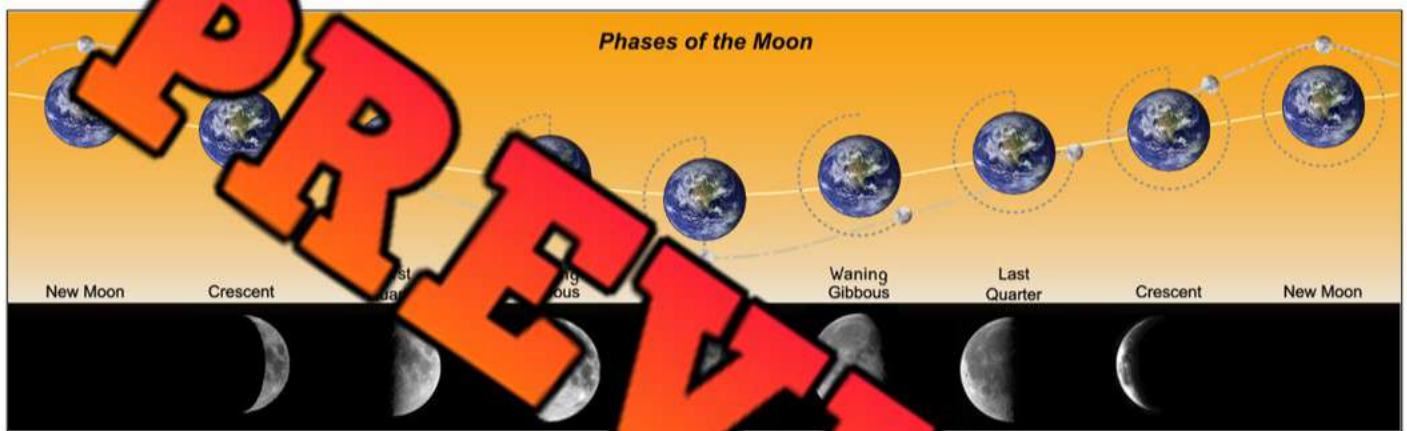
Circle the correct answer

1) The word "month" comes from which word?	Moon	Moonth
2) How long does it take for the Moon to go through all phases?	29.5 days	31 days
3) What calendar uses the phases of the Moon to measure time?	Haida	Gregorian
4) How many months do we divide the year into?	10	12
5) Which of these is a phase of the moon?	Blue Moon	Crescent

# Phases of the Moon

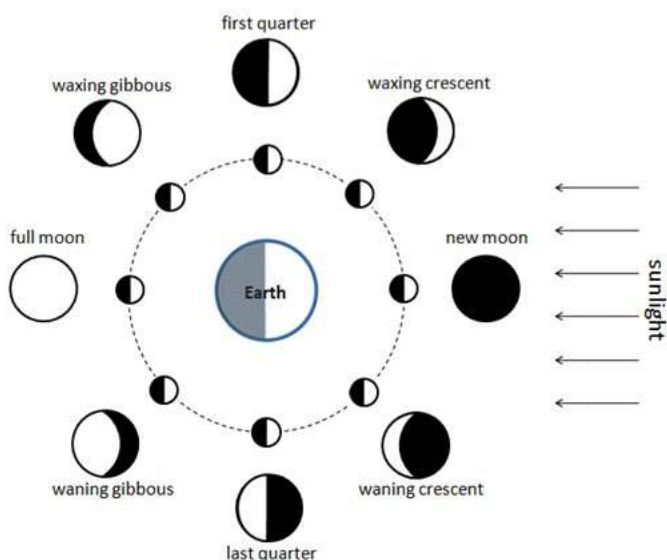
## What are the Phases of the Moon?

Have you ever noticed that the shape of the moon changes? Some nights the moon is a full circle, while other nights it is a small sliver. Astronomers have figured out that we have 8 main phases of the moon, meaning we have 8 different shapes of the moon that we can see on any given night.



## Why does the Moon change shape?

The Moon is shaped like a sphere, and it orbits around the Earth. The Moon takes about 4 weeks to finish one orbit around the Earth. **Orbit** means a path that is repeated over and over again. Since the orbit is repeated over and over again, we can predict exactly what phase of moon we will see in the future.



The moon will go through the 8 phases in the 4-week orbit. This is called the **lunar cycle**. We see a different shape because the Sun lights up different parts of the moon as it orbits around the Earth. A new moon can't be seen, while a full moon is completely visible on Earth. The Sun always lights up half of the moon, but what we see depends on where the Moon is in its orbit around the Earth.

**Diagram**

Draw each of the phases of the moon

Waxing Crescent	First Quarter	Waxing Gibbous	Full Moon	Waning Gibbous	Last Quarter	Waning Crescent	New Moon

**Questions**

Answer the questions below using evidence from the text

1) Why do we have different phases of the moon?

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2) What is the lunar cycle? If we see a full moon today, how many days until the next full moon?

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**True or False**

Circle whether the statement is true or false

1. There are 9 phases of the moon	True	False
2. The lunar cycle is 28 days long	True	False
3. The Earth orbits around the moon	True	False
4. The sun always lights up half of the moon	True	False
5. We cannot see a new moon	True	False

# Exit Cards

**Cut Out** Cut out the exit cards below and have students complete them at the end of class

Name: \_\_\_\_\_

Mark

Draw two phases of the Moon and label them.


Name: \_\_\_\_\_

Mark

Draw two phases of the Moon and label them.


Name: \_\_\_\_\_

Mark

Draw two phases of the Moon and label them.


Name: \_\_\_\_\_

Mark

Draw two phases of the Moon and label them.


**PREVIEW**

## Experiment – Moon Phases

Recreate the moon phases using Oreo cookies. Follow the instructions below to complete the activity.

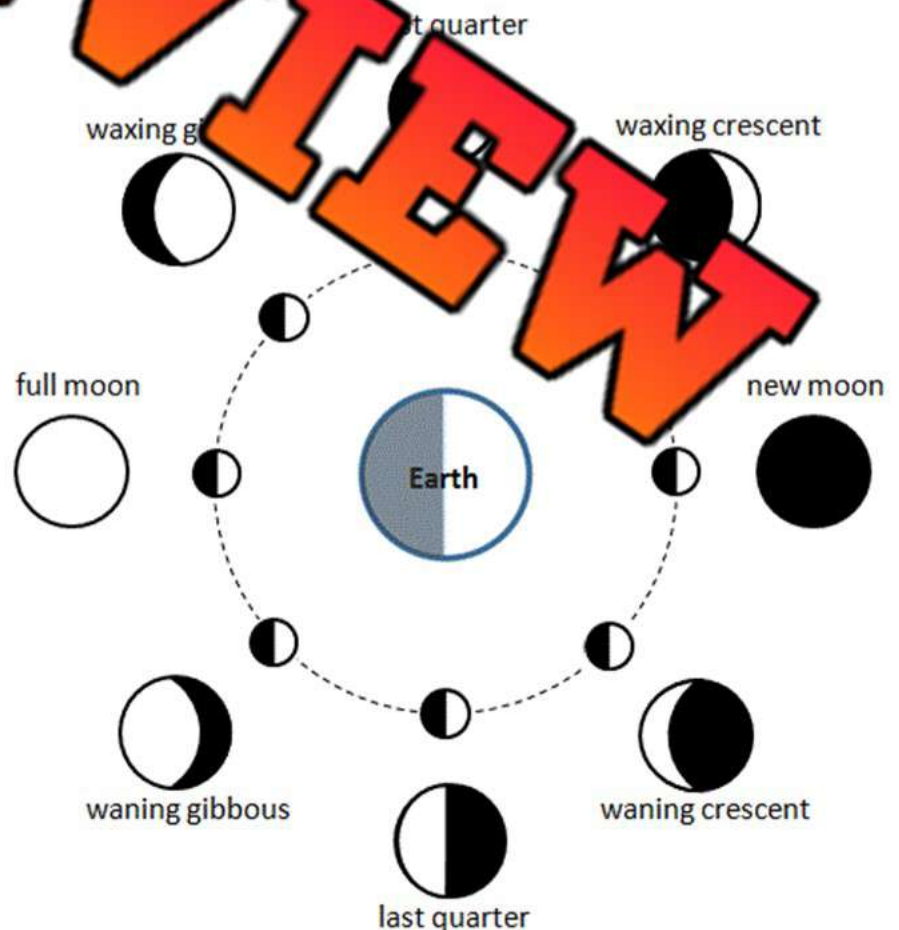
### Materials What you need

- 8 Oreos
- Popsicle sticks
- A popsicle stick to use for scraping the icing off the cookies



### Procedure How you can complete the activity

- 1) Separate the cookie so that the icing is on one side of the cookie and not the other. Twisting the cookie a bit works to achieve this.
- 2) Use the popsicle stick to create each phase of the moon
- 3) Glue the phase of the moon onto the paper plate. Make sure to put them in order
- 4) Label the moon phases with their official name



**Results**

Answer the questions below

1) Does the Moon emit light or reflect light?

2) Does the Moon move around the Earth or does the Earth move around the Moon?

3) Why do we see different phases of the moon?

4) Why are the phases of the moon predictable? How do astronomers know what moon phase we will have a month from now?

5) Go online and search "Moon Phase Calculator". Find out what moon phase we will have on your next birthday. Then find out the moon on your 30<sup>th</sup> birthday and about your 60<sup>th</sup> birthday?

Date	Name of Moon
Next Birthday	
30 <sup>th</sup> Birthday	
60 <sup>th</sup> Birthday	

Name: \_\_\_\_\_

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## Moon Calendar of Alberta's Indigenous Groups

### Moon Calendar of Alberta's Indigenous Groups

Indigenous groups in Alberta, Canada have been looking at the Moon for thousands of years to understand the changing seasons and to keep track of time. This way of measuring time is often called a "lunar calendar". Let's learn how it works!



*moon phases*

### What is a Lunar Calendar?

A lunar calendar is a type of calendar that's based on the Moon's cycles. Just like how a solar calendar is based on the Sun, a lunar calendar is based on the Moon. Instead of months, a lunar calendar has "moons".

### How does the lunar calendar work?

In Alberta, many Indigenous groups like the Cree and Blackfoot used the lunar calendar. Each moon in their calendar is named after what happens in nature during that time. Check out the examples below.

#### Blackfoot Moons:

- Cold Maker Moon (January): The moon of the coldest time of the year.
- Snow Moon (February): This moon appears when the snow is deep.
- Rain Falling Moon (March): The moon of the rainy season.
- Flowers Blooming Moon (May): This moon marks the beginning of spring.
- Long Days Moon (June): The moon of the longest days of the year.
- Black Cherries Moon (August): This is when chokecherries are ripe.

#### Cree Moons:

- Birch Moon (April): This moon comes when the birch sap starts flowing.
- Raspberry Moon (July): The moon when raspberries are ripe and ready to pick.
- Leaves Changing Colour Moon (September): The moon when leaves change colour.
- Flying Ducks Moon (October): This moon appears when ducks start their migration.
- Frost Moon (November): The moon when the first frost typically occurs.
- Freezing Moon (December): This moon presides over the coldest time of the year.

**Questions**

Answer the questions below using evidence from the text

1) How do the moons throughout the year relate to the environment changing?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2) What moon is it right now according to the Blackfoot/Cree Lunar Calendar? Explain what is happening in nature this month?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**True or False**

Is the sun the center of the solar system?

1) A lunar calendar is based on the Sun's cycles.	True	False
2) A lunar calendar is based on months.	True	False
3) 'Cold Maker Moon' marks the coldest time.	True	False
4) 'Flowers Blooming Moon' indicates flower bloom.		False
5) 'Flying Ducks Moon' signifies ducks hibernating		False

**Visualizing**

Draw what you were picturing while you were reading. Explain the picture

	_____
	_____
	_____
	_____
	_____

## Story - Little Bear and the Lunar Calendar

**Draw**

Illustrate the story by adding pictures to the book

### Little Bear and the Lunar Calendar

Once upon a time, in the vast lands of Alberta, there lived a young Cree boy named Little Bear. Little Bear was curious and loved to learn about the world around him. His grandmother, a wise and respected elder in their community, often told him stories about the night sky. Little Bear loved these stories, but what he loved most were the moons that shone brightly above them.

In January, during the coldest winter, his grandmother pointed to the sky and said, "Look, Little Bear, it's the Frost Moon." Little Bear looked up and saw the full moon's bright glow against the dark, snowy landscape. He learned that in this cold time, the frost could be so thick that the trees pop and crack.

When April arrived, the snow had begun to melt, and life was returning to the forest. One night, his grandmother pointed upwards again, "That's the 'Goose Moon.' It's a sign the geese are returning from the south." Little Bear had heard the honking of geese overhead, but it seemed so far away that he didn't realize they had arrived.

By June the days were long and warm. "See the 'Goose Moon,' Little Bear?" his grandmother asked. Under the full moon, he could hear the faint peeping of baby birds in their nests. The moon was telling them that it was a time of birth and growth.

When August came, his grandmother said, "Now is the time of the 'Flying Up Moon.' Look at the young birds learning to fly." Little Bear watched as small birds fluttered awkwardly, trying out their new wings under the moonlit sky.

**PREVIEW**

In September, the leaves started changing. His grandmother pointed to the 'Leaves Changing Color Moon.' "The moon is teaching the sky is changing again, Little Bear. Winter is not far away now."

# PREVIEW

December finally arrived, bringing with it the "Little Spirit Moon." His grandmother explained, "This is a time for us to be thankful for what we have and to think about the year that has passed."

Little Bear found comfort in the constant cycle of the moons. Each one brought changes to the world around him, but also, each one brought new learnings and experiences. The moons were his guide throughout the year, always reliable and enlightening.

## Cree Story - Wesakechak

Once upon a time, long, long ago, in the days when the Earth was young, there was a Cree tribe living in the region now known as Alberta.

The tribe loved to tell stories, and their favorite story was about Wesakechak, the trickster god, and how he brought the Sun and the Moon into the sky.

According to the story, there was a time when the Earth was dark. The people could not see, and they kept bumping into each other. They asked Wesakechak for help.

Wesakechak was a kind and mischievous god who loved to help people but also enjoyed a good joke. He wanted to help the people and had a bright idea.

He traveled far away to the east, where he found a large glowing ember from a mighty fire. It was as bright and warm as the sun and moon combined. He took the ember and threw it high into the sky, where it stuck and became the Sun. It lit up the world and brought warmth to the people.

The people were happy but soon realized the Sun was too bright and hot to be in the sky all the time. They could not rest, and it was too hot to do anything. Again, they asked Wesakechak for help.

Wesakechak then traveled to the west, where he found a beautiful pebble by a cool stream. He tossed the pebble into the sky where it stuck and became the Moon. The Moon was cooler and softer than the Sun, perfect for when the people needed to rest.

The people were finally happy. They had the Sun to warm and light their days, and the Moon to cool and softly light their nights. And that is how Wesakechak gave the Cree people the Sun and the Moon.

From then on, every time the Cree people saw the Sun rise and the Moon glow, they would remember Wesakechak and the great gifts he had given them.



**True or False**

Circle whether the statement is true or false

1) Wesakechak was a Cree god.	True	False
2) Wesakechak found the Sun in the west.	True	False
3) The Sun came from a glowing ember.	True	False
4) The people were unhappy with the Sun.	True	False
5) The Sun and the Moon were both gifts from Wesakechak.	True	False

**Questions** Answer the questions below using evidence from the text

1) Describe how the Cree created the Sun according to the story.

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2) What problem did the people face after the Sun was placed in the sky and how was it resolved?

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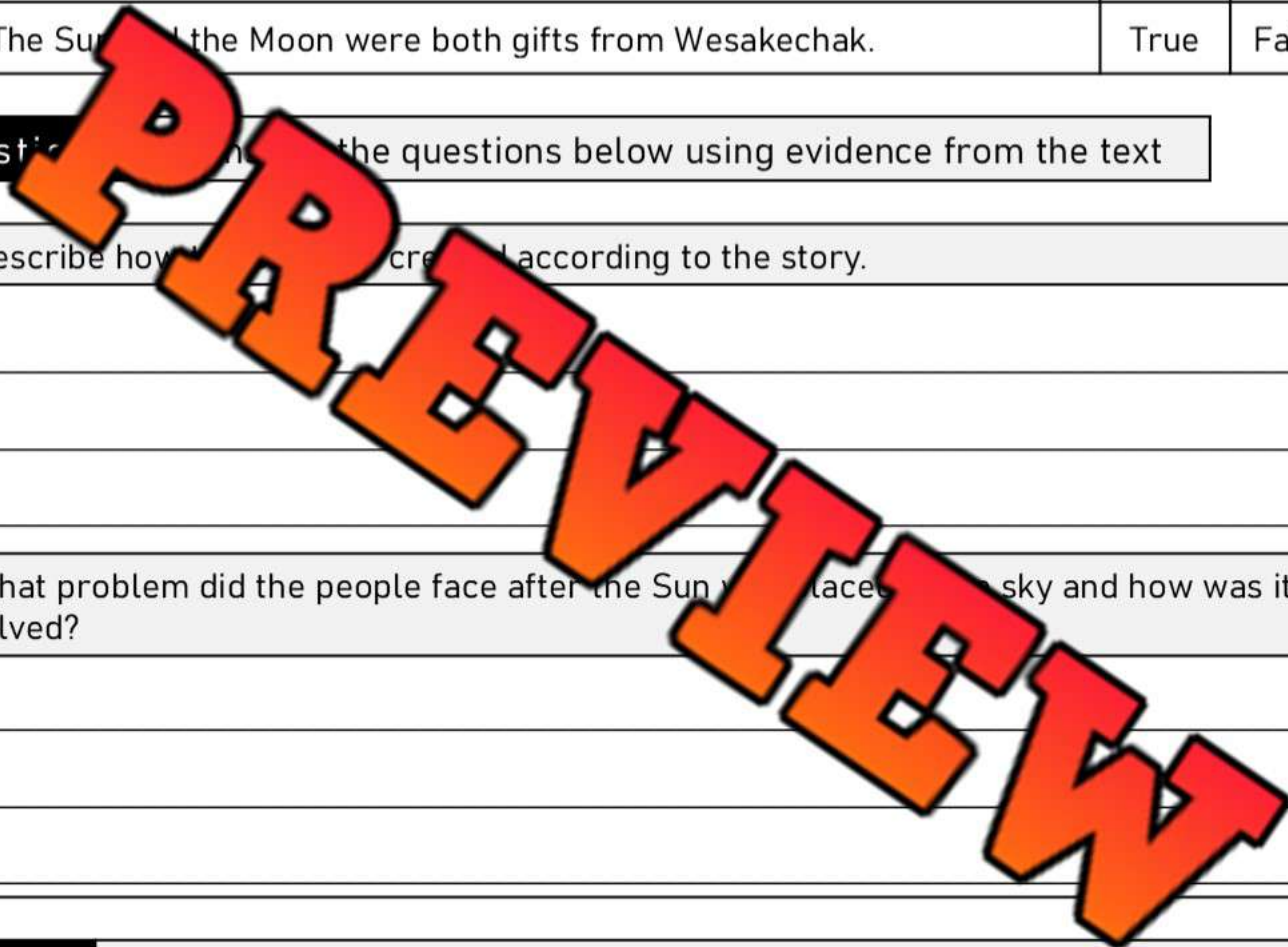
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**Visualizing**

Draw what you were picturing while you were reading. Explain the picture

	_____
	_____
	_____
	_____
	_____



## What is the Gregorian Calendar?

### What is the Gregorian Calendar?

Did you know that there are many types of calendars? The one most of us use today is called the Gregorian Calendar. This is our international standard calendar.

### How Does the Gregorian Calendar Work?

The Gregorian Calendar is based on the Earth's journey around the Sun. This journey is what we call a year. It takes about 365.25 days for the Earth to complete this journey. But, we can't have a quarter of a day on our calendar, can we?

### What Are Years, Leap Years

So, we say a year has 365 days. But what about that extra quarter day? Well, we save them up. Every four years, we have an extra day from those quarter days. We add this extra day to our calendar. This year with an extra day is called a leap year, and it has 366 days. This day is February 29<sup>th</sup>.

The complete list of leap years in the first half of the 21st century is therefore 2000, 2004, 2008, 2012, 2016, 2020, 2024, 2028, 2032, 2036, 2040, 2044, 2048, 2052, 2056, 2060, 2064, 2068, 2072, 2076, 2080, 2084, 2088, 2092, and 2096.

### Using the Gregorian Calendar in Daily Life

Everyone around the world uses the Gregorian Calendar in daily life. It helps us know what day it is, when to celebrate holidays, and even when to start school. So, the next time you look at a calendar, remember that it's not just a bunch of squares and numbers. It's a tool that helps us keep track of our trip around the Sun!



**True or False**

Circle whether the statement is true or false

1) Gregorian Calendar is our international standard.	True	False
2) The Earth's journey around the Sun is called a year.	True	False
3) The Earth takes 365.25 days to orbit the Sun.	True	False
4) A leap year has 367 days.	True	False
5) The Gregorian Calendar is based on the Moon's cycles.	True	False

**Questions** Answer the questions below using evidence from the text

1) What is the Gregorian Calendar? How does it work?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2) Why do we need leap years?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Think**

How many days are in each of the years below?

	Year	Days
1)	2024	
2)	2026	
3)	2028	
4)	2030	

	Year	Days
5)	2048	
6)	2064	
7)	2072	
8)	2099	

## Comparing Calendars: Lunar vs Gregorian?

### What is a Lunar Calendar?

A lunar calendar is a type of calendar based on the cycles of the moon. Here are some key points about lunar calendars:



### What is the Gregorian Calendar?

The Gregorian calendar, also known as the international standard calendar, is based on the Earth's rotation around the sun. Here's what you need to know:

### How are They Similar?

Both the lunar and Gregorian calendars are used to keep track of time. They both have cycles (months and years) that repeat over and over. In addition, they are both based on the repeating events involving the Earth's rotation.

### How are They Different?

- Based on Different Things: The lunar calendar is based on the moon's cycles, while the Gregorian calendar is based on the Earth's rotation around the sun.
- Length of Months: In a lunar calendar, each month is about the length of the moon's cycle (approximately 29.5 days), matching the moon's cycle. In the Gregorian calendar, months can have 28, 30, or 31 days.
- Starting the Year: Lunar calendars often start the year based on a particular phase of the moon. The Gregorian calendar starts the year on January 1, no matter what the moon looks like.
- Usage: Lunar calendars are often used for cultural or religious reasons. The Gregorian calendar is used for everyday activities and schedules worldwide.

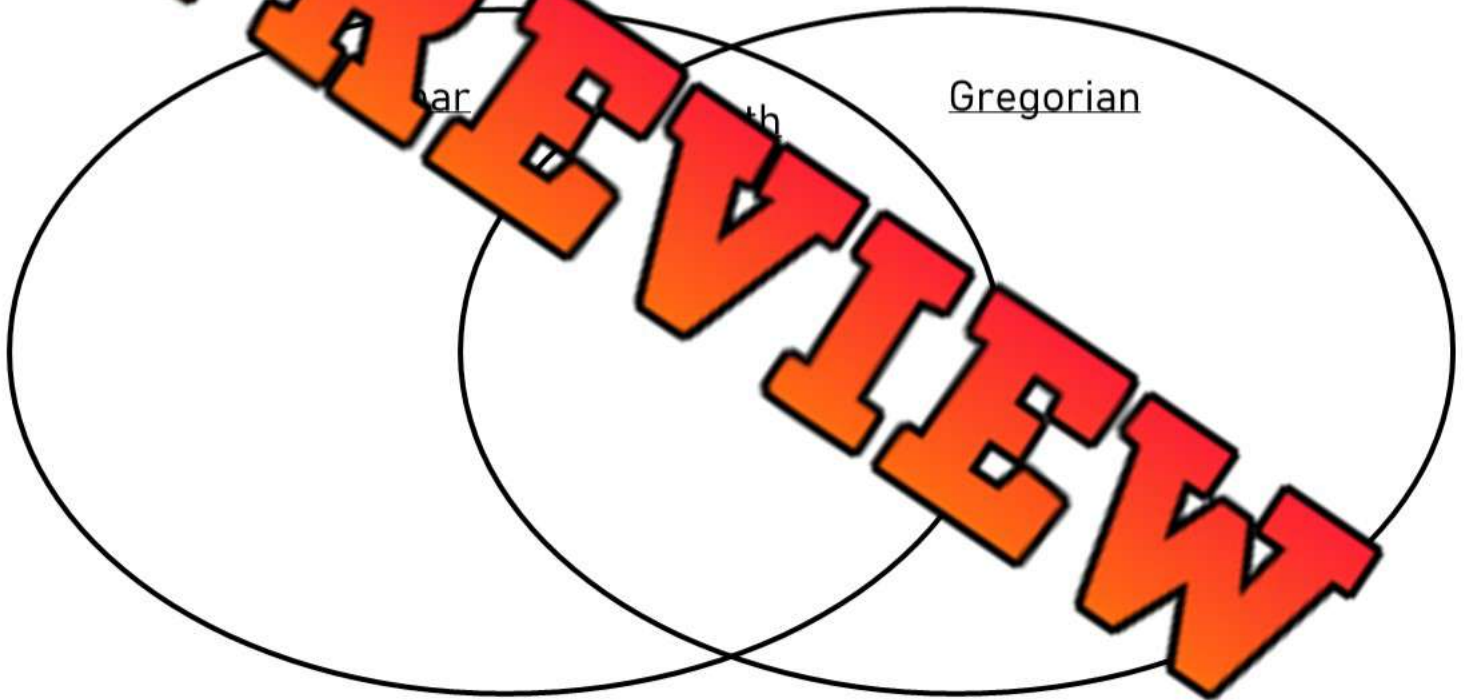


**True or False**

Circle whether the statement is true or false

1) Lunar calendars are based on the sun.	True	False
2) Gregorian calendar has 10 months.	True	False
3) Both calendars have repeating cycles.	True	False
4) Gregorian calendar months vary in length.	True	False
5) The Gregorian calendar always starts the year on January 1.	True	False

**Compare** the Lunar Calendar and Gregorian Calendar



**Question**

Which calendar do you prefer? Explain.

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# Paper Gregorian Calander Code Wheel

## Objective

What are we learning about?

Through this offline coding activity, students will enhance their understanding of the Gregorian calendar, including the sequence and length of each month.

## Materials

What do we need for our experiment?

- 1) Two pieces of cardstock or thick paper
- 2) A brad (or pushpin)
- 3) Markers or colored pencils
- 4) Scissors
- 5) Ruler
- 6) Pencil



## Method

How do we create the code wheel?

- 1) Cut two circles from the cardstock paper. One circle should be larger than the other one. The larger one will represent the months of a year. The smaller one will represent the days in a month.
- 2) On the outer edge of the larger circle, write the names of the 12 months. Divide the circle equally so that each month has its own section.
- 3) On the outer edge of the smaller circle, write the numbers 1 to 31 around the circle. This will represent the possible number of days in a month.
- 4) Put the smaller circle on top of the larger one, lining up the 1 on the smaller circle with January on the larger one.
- 5) Push the brad through the centers of both circles to hold them together. This will let you spin the circles around.
- 6) Now you have a "Gregorian Calendar" code wheel! You can spin the smaller circle to see how many days are in each month. Remember, some months have 30 days, some have 31, and February has 28 or 29.
- 7) As a coding activity, the teacher can give each student a date (e.g., "April 5" or "October 23"). The student will then have to spin their "Gregorian Calendar" code wheel to find the given date.

**Results**

Answer the questions below

1) Which months have 31 days?

2) Which months have 30 days?

3) How many days does February have? Why is it different?

4) Can you find your birthday on the code wheel? What about other dates like Halloween or New Year's Day?

**Important Dates**

Birthday: \_\_\_\_\_

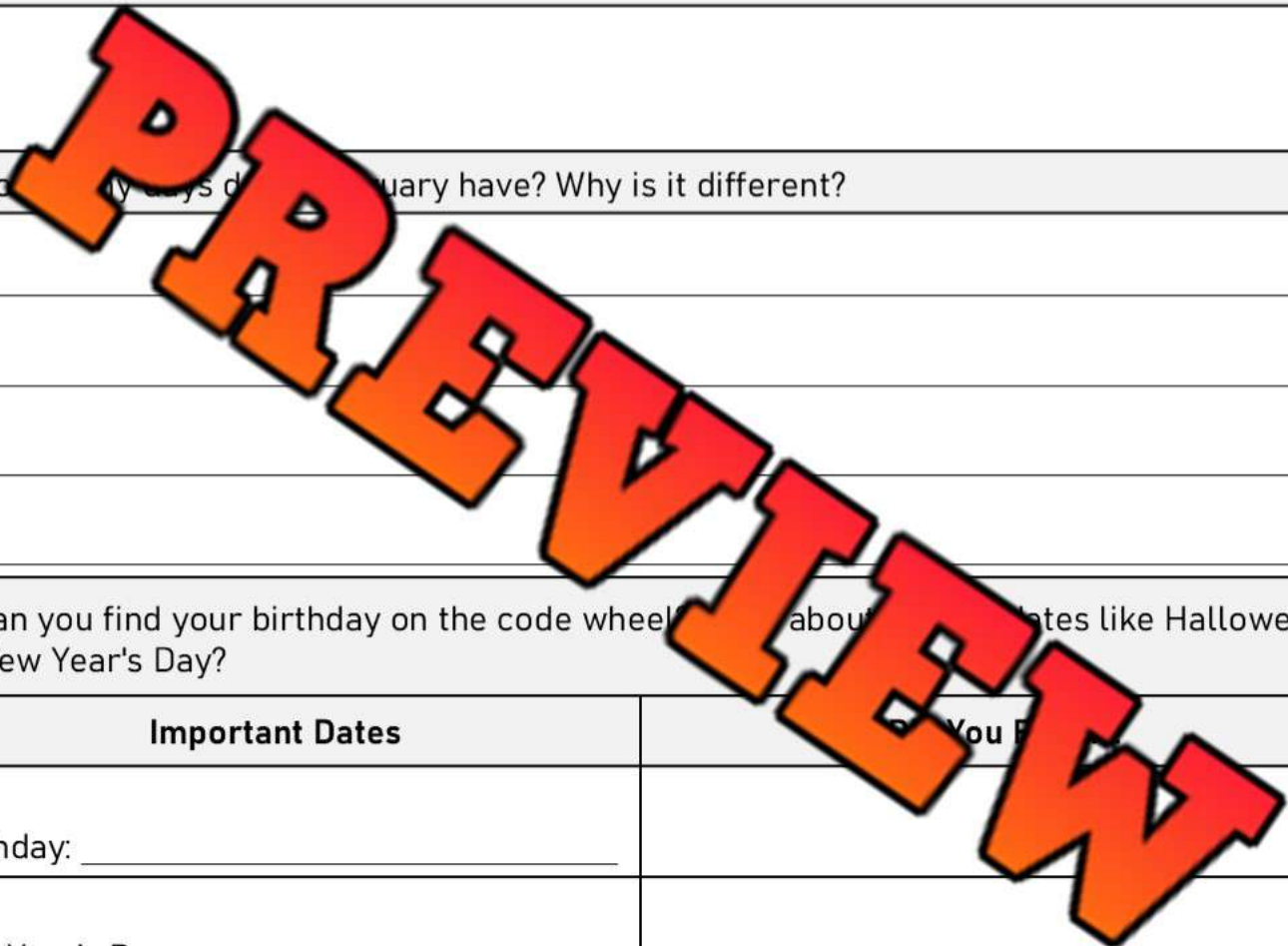
New Year's Day: \_\_\_\_\_

Halloween: \_\_\_\_\_

Valentine's Day: \_\_\_\_\_

Easter: \_\_\_\_\_

Canada Day: \_\_\_\_\_



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Unit Test - Space

### Multiple Choice

/10

<p>1) Which planets are beside the Earth?</p> <p>a) Mars and Jupiter</p> <p>b) Mercury and Mars</p> <p>c) Venus and Mars</p> <p>d) Jupiter and Saturn</p>	<p>2) Which is the largest?</p> <p>a) The Earth</p> <p>b) The Milky Way Galaxy</p> <p>c) Our Solar System</p> <p>d) The Universe</p>
<p>3) Which calendar do most people follow?</p> <p>a) Lunar</p> <p>b) Solar</p> <p>c) Gregorian</p> <p>d) None of the above</p>	<p>4) What is a Gregorian calendar based on?</p> <p>a) Sun</p> <p>b) Moon</p> <p>c) Earth</p> <p>d) Stars</p>
<p>5) What does Earth's rotation cause?</p> <p>a) Day and night</p> <p>b) Seasons</p> <p>c) Both</p> <p>d) None of the above</p>	<p>6) What is Earth's movement around the Sun called?</p> <p>a) Spinning</p> <p>b) Revolution</p> <p>c) Revolution</p> <p>d) Rotation</p>
<p>7) Which star always points to the North?</p> <p>a) Sirius</p> <p>b) Orion</p> <p>c) Polaris</p> <p>d) Vega</p>	<p>8) The Earth orbits the Sun in _____ days.</p> <p>a) 24 hours</p> <p>b) 12 hours</p> <p>c) 30 days</p> <p>d) 365 days</p>
<p>9) What does a Full Moon in the lunar calendar signify?</p> <p>a) New month</p> <p>b) End Month</p> <p>c) Mid Month</p> <p>d) New year</p>	<p>10) Which telescope is in space?</p> <p>a) Planetarium</p> <p>b) James Webb Telescope</p> <p>c) Gregorian Telescope</p> <p>d) Hubble Telescope</p>

**Definitions**

What does each term mean? (1 mark each)

Term	Definition (what does it mean)
Universe	
Moon	
Constellation	

**Short Answer**

Answer the questions - Each question is worth 2 marks

1) What technologies can be used to see space objects from Earth? .

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2) Why should we never look at the Sun?

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3) Why can we see space objects only at night and not during the day?

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