WINTER BREAK LEARNING PACKET

STEM

5TH GRADE STUDENT

DEC 22ND – JAN 5TH

DEPARTMENT OF CURRICULUM & INSTRUCTION

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WEEK ONE - DECEMBER 22-26, 2025

STANDARD: 5.ESS1.3 Use a model to explain how the orbit of the Earth and sun cause observable patterns: a. day and night; b. changes in length and direction of shadows over a day.

ACTIVITY I

- Complete the activity titled: Shadow Detectives – Tracking the Sun!
- Find a stick outside and put it upright in the sunlight to create a shadow.
- Trace the shadow three times: in the morning, at noon, and in the afternoon.
- Measure the length and note the direction of each shadow and answer the reflection questions.
- Then read the short passage and complete the claim, evidence, and reasoning activity.

WEEK TWO - DECEMBER 29 - January 2, 2026

STANDARD: 5.ESS1.4 Explain the cause-and-effect relationship between the positions of the sun, earth, and moon and resulting eclipses, tides, and appearance of the moon.

ACTIVITY II

- Draw what a solar eclipse should look like from the passage you read.
- Label each part.
- Explain your diagram in your own words.
- Read the passage and complete the Moon Detectives: Tracking Phases and Tides Activity
- Follow the instructions (you can use a cell phone for light if needed).

WEEK ONE - DECEMBER 22-26, 2025

STANDARD: 5.ESS1.3 Use a model to explain how the orbit of the Earth and sun cause observable patterns: a. day and night; b. changes in length and direction of shadows over a day.

ACTIVITY I

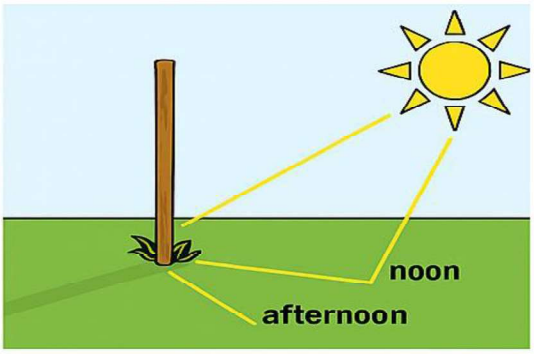
Morning

Shadow Detectives – Tracking the Sun!

Activity Instructions

- Put a stick upright in sunlight to create a shadow.
- Trace the shadow three fimes: in morning, at noon, an in the afternoon.
- Measure the length and note the direction of each shadow.
- Answer the reflection questions.

Observations



Time: _____

Length: _____

Direction: _____

Draw a diagram showing the Sun and Earth, and how rotation causes day and night

Reflection Questions

- Why did the shadow move?
- Why did the shadow get shorter or longer?
- How does the rotatlon of Earth cause day and night?

_____

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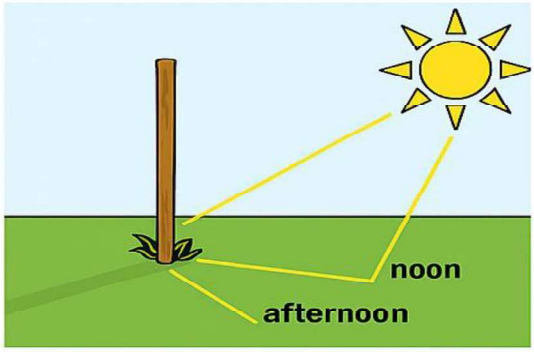
Noon

Shadow Detectives – Tracking the Sun!

Activity Instructions

- Put a stick upright in sunlight to create a shadow.
- Trace the shadow three fimes: in morning, at noon, an in the afternoon.
- Measure the length and note the direction of each shadow.
- Answer the reflection questions.

Observations



Time: _____

Length: _____

Direction: _____

Draw a diagram showing the Sun and Earth, and how rotation causes day and night and sdb changes.

Reflection Questions

- Why did the shadow move?
- Why did the shadow get shorter or longer?
- How does the rotatlon of Earth cause day and night?

_____

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_____

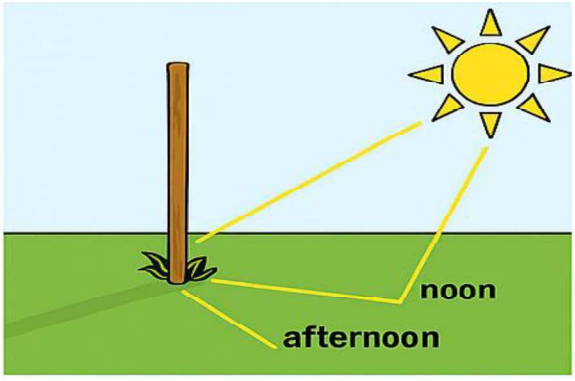
Afternoon

Shadow Detectives – Tracking the Sun!

Activity Instructions

- Put a stick upright in sunlight to create a shadow.
- Trace the shadow three fimes: in morning, at noon, an in the afternoon.
- Measure the length and note the direction of each shadow.
- Answer the reflection questions.

Observations



Time: _____

Length: _____

Direction: _____

Draw a diagram showing the Sun and Earth, and how rotation causes day and night and sdb changes.

Reflection Questions

- Why did the shadow move?
- Why did the shadow get shorter or longer?
- How does the rotatlon of Earth cause day and night?

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Why Do Shadows Change?

Have you ever noticed your shadow in the morning? It is long and stretches across the ground. At noon, your shadow is short and right under you. In the afternoon, it grows long again but points in a different direction. Why does this happen?

The Sun does not move around Earth. Instead, Earth spins on its axis. This spinning is called rotation, and it takes 24 hours to make one full turn. When your part of Earth faces the Sun, it is daytime. When it turns away, it is nighttime. This rotation also makes shadows change. In the morning, the Sun is low in the sky, so shadows are long. At noon, the Sun is high overhead, so shadows are short. Later in the day, the Sun moves lower again, and shadows grow long in the opposite direction. These patterns happen every day because of Earth's rotation.

Claim, Evidence, and Reasoning

Using the information from the text to complete the Claims, Evidence, and Reasoning chart.

1. State your claim – Answer the question: Why do shadows on Earth change?
2. State the evidence – What evidence from the information provided supports that?
3. Reasoning – Why does the evidence you provide support the claim?

WEEK TWO - DECEMBER 29 - January 2, 2026

STANDARD: **5.ESS1.4 Explain the cause-and-effect relationship between the positions of the sun, earth, and moon and resulting eclipses, tides, and appearance of the moon.**

ACTIVITY II

Solar and Lunar Eclipse

An eclipse happens when a planet or a moon gets in the way of the Sun's light. Here on Earth, we can experience two kinds of eclipses: solar eclipses and lunar eclipses.

A solar eclipse happens when the Moon gets in the way of the Sun's light and casts its shadow on Earth. That means during the day, the Moon moves between the Sun, and it gets dark. A new moon is typically seen during this eclipse. This total eclipse happens about every year and a half somewhere on Earth. Seeing a solar eclipse is rare. The last total solar eclipse happened in 2017. North America will experience another total solar eclipse on April 8, 2024.

During a lunar eclipse, Earth gets in the way of the Sun's light hitting the Moon. Unlike a solar eclipse, the Earth is in the center of the moon and sun.

The Moon will look reddish or orange because Earth's atmosphere absorbs the other colors while it bends some sunlight toward the Moon. Sunlight bending through the atmosphere and absorbing other colors is also why sunsets are orange and red.

During a total lunar eclipse, the Moon appears full due to the sunlight shining from all the sunrises and sunsets occurring on Earth.

Name: _____

Eclipse Diagrams

Solar Eclipse

Draw what a solar eclipse should look like from the passage you read above. Make sure to label each part. Explain your diagram in your own words.

Explain:

Lunar Eclipse

Draw what a lunar eclipse should look like from the passage you read above. Make sure to label each part. Explain your diagram in your own words.

Explain:

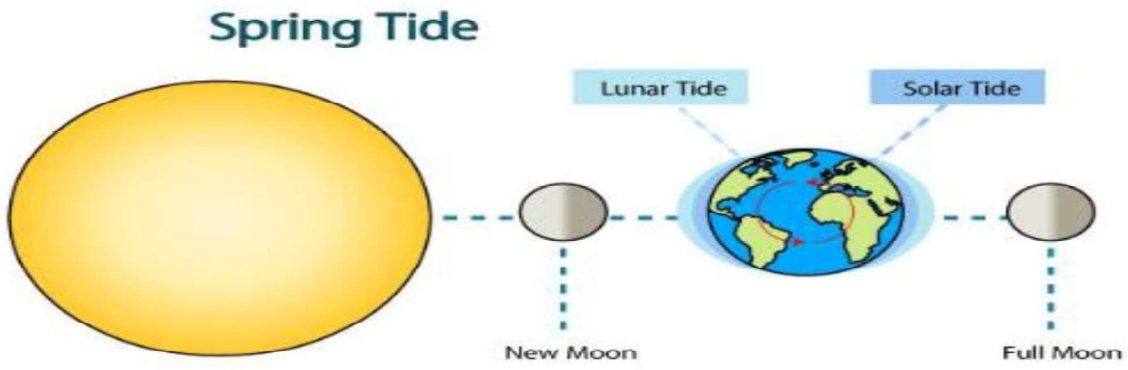
What Causes Tides?

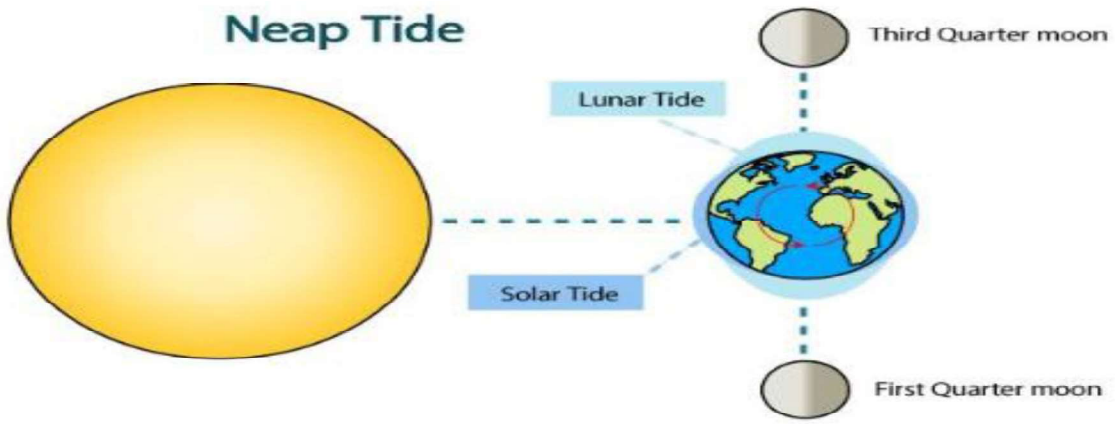
Have you ever noticed that the ocean water moves in and out during the day? These changes are called **tides**. A tide is the rise and fall of ocean water. But what makes this happen?

The main cause of tides is **gravity**. The Moon's gravity pulls on Earth's oceans. This pull makes the water bulge out on the side of Earth facing the Moon. That bulge is a **high tide**. There is also a high tide on the opposite side of Earth because water is pulled slightly away from the center. The areas in between have **low tides**.

The Sun also has gravity, and it affects tides too. When the Sun, Moon, and Earth are in a straight line (during a **new moon** or **full moon**), their gravity works together. This makes **spring tides**, which are extra high and extra low tides. When the Sun and Moon are at a right angle to Earth (during **quarter moons**), their gravity pulls in different directions. This makes **neap tides**, which are smaller changes in water level.

Tides happen every day, and they are important for sea life, boats, and even people who visit the beach. Next time you go near the ocean, look for the high tide and low tide marks!





NEW MOON

Moon Detectives · Tracking Phases & Tides!

Activity Instructions

· Use a lamp as the Sun.
· Hold a ball as the Moon and turn slowly around yourself (Earth).
· Watch how the lit part changes and draw each phase.
· Think about how Moon·s position affects tides.

Observations

Draw the Moon phases you see:

Positions:
New Moon: _____x_____
Full Moon: _____
Quarter: _____

Draw Sun, Earth, and Moon positions:

Reflection Questions

· Why does the Moon look different as it moves?
· Why do tides change with the Moon·s position?
· When are tides strongest?

FULL MOON

Moon Detectives · Tracking Phases & Tides!

Activity Instructions

· Use a lamp as the Sun.
· Hold a ball as the Moon and turn slowly around yourself (Earth).
· Watch how the lit part changes and draw each phase.
· Think about how Moon·s position affects tides.

Observations

Draw the Moon phases you see:

Positions:
New Moon: _____
Full Moon: _____x_____
Quarter: _____

Draw Sun, Earth, and Moon positions:

Reflection Questions

· Why does the Moon look different as it moves?
· Why do tides change with the Moon·s position?
· When are tides strongest?

_____

_____

_____

QUARTER MOON

Moon Detectives · Tracking Phases & Tides!

Activity Instructions

· Use a lamp as the Sun.
· Hold a ball as the Moon and turn slowly around yourself (Earth).
· Watch how the lit part changes and draw each phase.
· Think about how Moon·s position affects tides.

Observations

Draw the Moon phases you see:

Positions:
New Moon: _____
Full Moon: _____
Quarter: _____ x

Draw Sun, Earth, and Moon positions:

Reflection Questions

· Why does the Moon look different as it moves?
· Why do tides change with the Moon·s position?
· When are tides strongest?

Answer Key

ACTIVITY I

Shadow Detectives

Activity Goal:
Students observe how shadows change in length and direction throughout the day and connect this to Earth's rotation.

Observations (Sample Answers):

- **Morning:**
  - Time: 9:00 AM
  - Length: Long
  - Direction: West
- **Noon:**
  - Time: 12:00 PM
  - Length: Shortest
  - Direction: North
- **Afternoon:**
  - Time: 3:00 PM
  - Length: Long again
  - Direction: East

Diagram:

Students should draw the Sun on one side, Earth rotating, and arrows showing how sunlight creates shadows that move as Earth rotates.

Reflection Questions (Sample Responses):

1. **Why did the shadow move?**
   Because Earth rotates, changing the Sun's position in the sky.
2. **Why did the shadow get shorter or longer?**
   Shadows are shortest when the Sun is overhead (noon) and longer when the Sun is lower in the sky (morning and afternoon).
3. **How does the rotation of Earth cause day and night?**
   As Earth rotates, different parts face the Sun (day) or turn away from it (night).

Claim, Evidence, and Reasoning

Using the information from the text to complete the Claims, Evidence, and Reasoning chart.

4. State your claim – Answer the question: Why do shadows on Earth change?
5. State the evidence – What evidence from the information provided supports that?
6. Reasoning – Why does the evidence you provide support the claim?

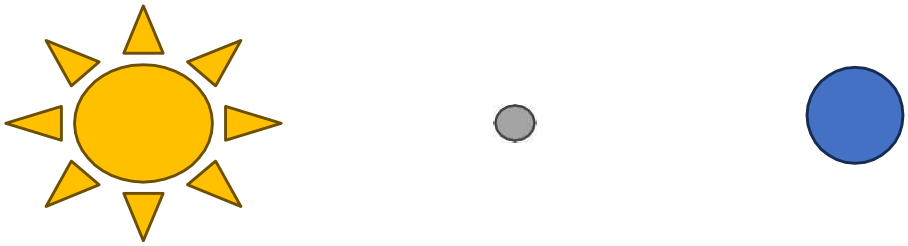
	Shadows on Earth change because Earth rotates, causing the Sun's position in the sky to appear different throughout the day.
	The text says: "The Sun does not move around Earth. Instead, Earth spins on its axis. This spinning is called rotation, and it takes 24 hours to make one full turn." It also explains: "In the morning, the Sun is low in the sky, so shadows are long. At noon, the Sun is high overhead, so shadows are short. Later in the day, the Sun moves lower again, and shadows grow long in the opposite direction."
	Because Earth rotates, the angle of sunlight changes during the day. When the Sun is low in the sky (morning or late afternoon), light hits objects at a slant, making long shadows. When the Sun is high overhead (noon), light hits objects directly, making short shadows. This daily pattern happens because of Earth's rotation.

ACTIVITY II

Eclipse Diagrams

Solar Eclipse

Draw what a solar eclipse should look like from the passage you read above. Make sure to label each part. Explain your diagram in your own words.



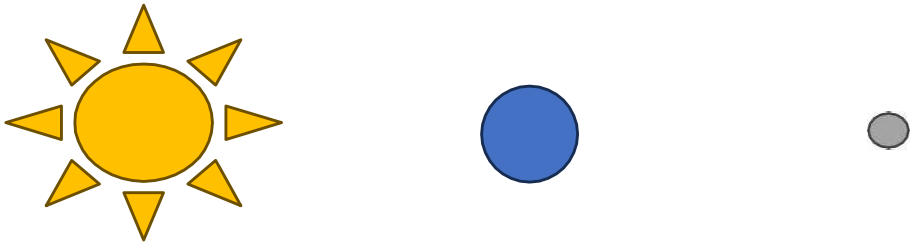
Sun Moon Earth

Explain:

During a solar eclipse the moon is in the middle of the sun and Earth. I remember this by using the acronym SOL (S for sun, O for moon, and L for Land). We see a new moon during a solar eclipse because there is no light shining on the side of the moon facing Earth.

Lunar Eclipse

Draw what a lunar eclipse should look like from the passage you read above. Make sure to label each part. Explain your diagram in your own words.



Sun Earth Moon

Explain:

During a lunar eclipse the Earth is in the middle of the sun and moon. I remember this because it is the opposite of a solar eclipse. We see a full moon during a lunar eclipse because the sun's rays are shining on the side of the moon facing Earth making it appear red or orange.

Moon Detectives · Tracking Phases & Tides!

Activity Instructions

· Use a lamp as the Sun.
· Hold a ball as the Moon and turn slowly around yourself (Earth).
· Watch how the lit part changes and draw each phase.
· Think about how Moon·s position affects tides.

Observations

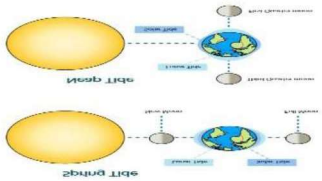
Draw the Moon phases you see:

New Moon: dark circle
Full Moon: fully lit circle
Quarter Moon: half lit circle

Positions:
New Moon: ●
Full Moon: ○
Quarter: ◑

Draw Sun, Earth, and Moon positions:

Reference the chart in the above reading.



Reflection Questions

· Why does the Moon look different as it moves?
· Why do tides change with the Moon·s position?
· When are tides strongest?

- Because we see different amounts of sunlight reflected from the Moon as its position changes around Earth.
- The Moon's gravity pulls on Earth's oceans. When the Moon is aligned with the Sun, tides are stronger (spring tides). When at a right angle, tides are weaker (neap tides).
- During **spring tides**—at new moon and full moon when the Sun, Moon, and Earth are in a straight line.