

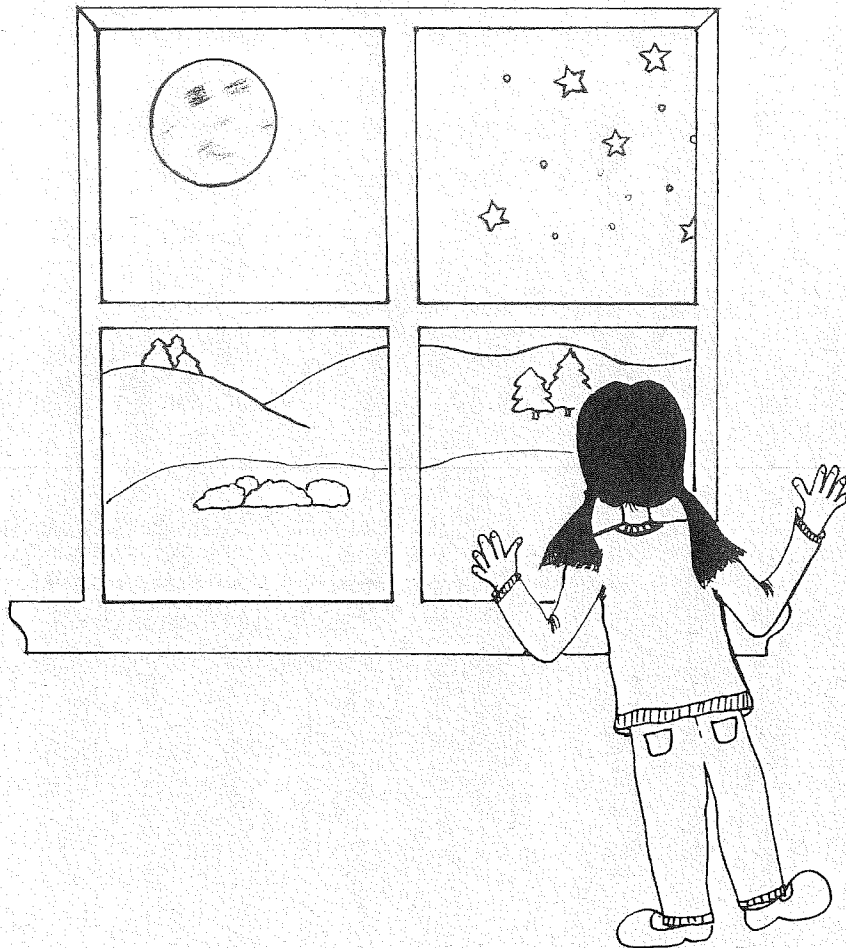
BATTLE CREEK AREA

Mathematics &  
Science Center

Student Journal

4ES

# View From the Earth



A Fourth Grade Unit  
supporting the  
Michigan Science K-7 Content Expectations

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

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

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



1. Your class is collecting weather data. Explain what information can be learned by keeping a log that records the temperature, wind direction, wind speed, precipitation, cloud cover, and position of the sun over a period of time.

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2. Describe how the weather data relates to the season you are currently experiencing.

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3. Predict how the weather data might change in the following weeks and how the changes in weather are related to the seasons.

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4. Predict how the position of the sun in the sky might change in the following weeks.

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

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

**2**

**Moon Observations**

Date	Time	Moon Shape	Location of Moon	Comments

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

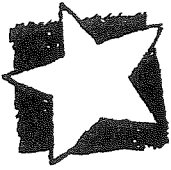


Date: \_\_\_\_\_

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Draw and label a picture map of the moon observation area in your schoolyard. Draw the position of the moon you observed today. (Label the moon, point of reference, any landmarks, and north, south, east, and west in your picture.)



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

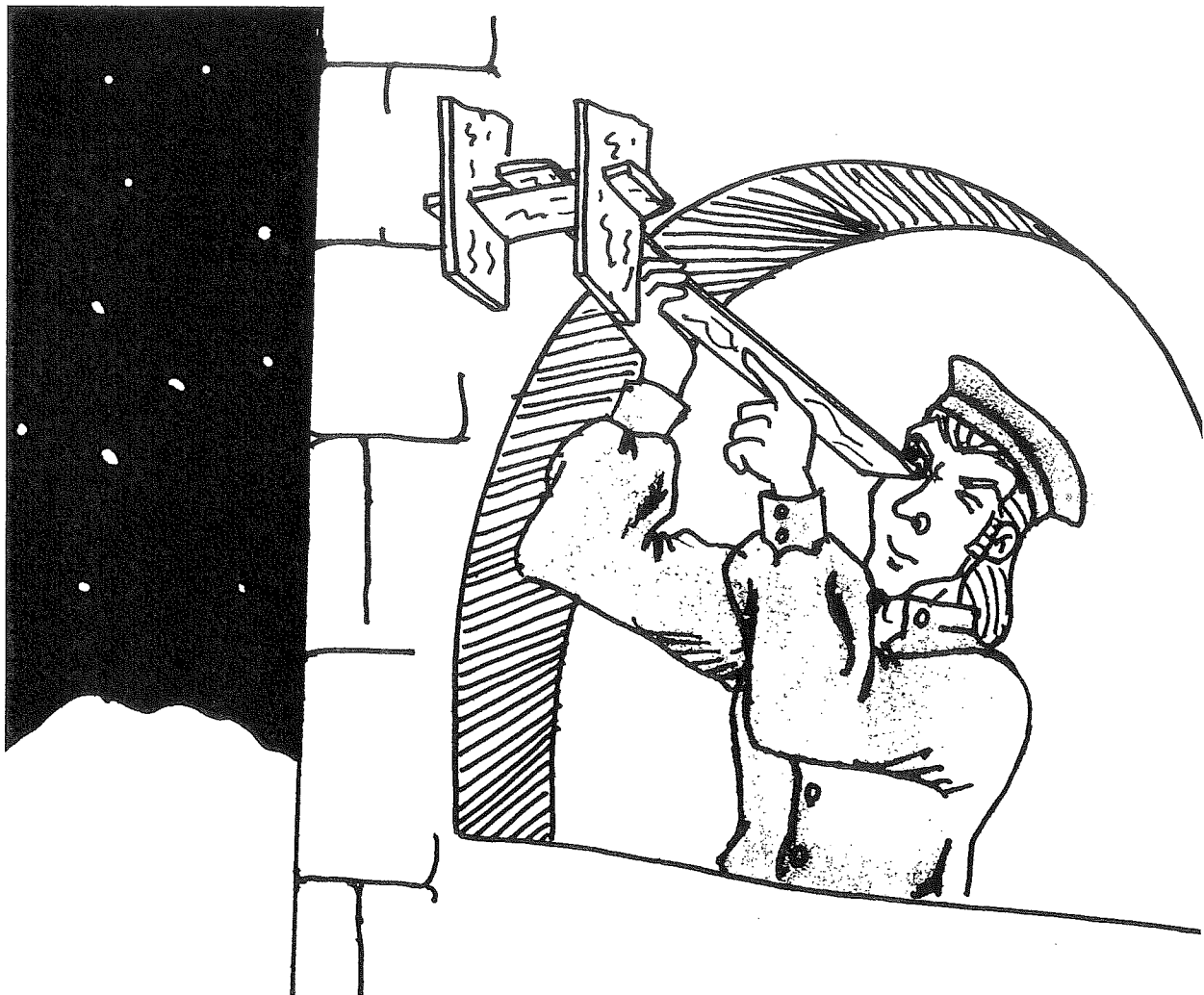
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**3**

**Nicolaus Copernicus**

When we see the sun each day, it looks like it is moving across the sky. People of long ago believed that the moon, the sun, the stars, and all the objects in space moved around the Earth while the Earth stayed still.

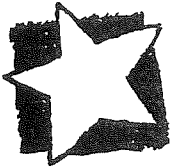
More than 500 years ago, a man from Poland named Nicolaus Copernicus learned how the sun, the moon, and the Earth really move. He read everything he could find about astronomy in college. He watched the sky and measured the objects moving in space with a simple tool called a cross-staff.



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

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

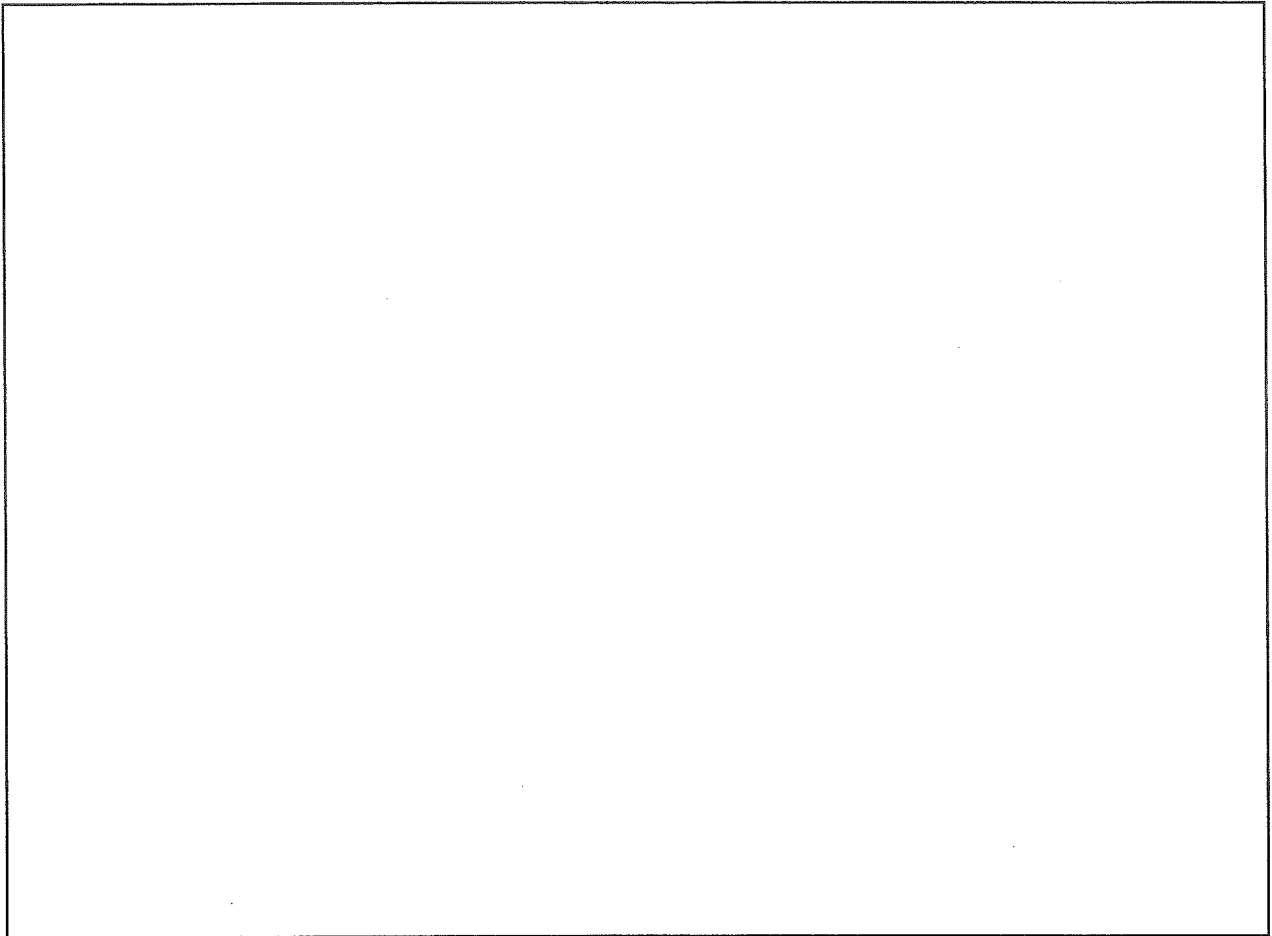
JOURNAL  
What Makes Daytime and  
Nighttime? (cont.)



3

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Draw and label a diagram that shows how the Earth moves to give us day and night.  
Write a caption for your diagram that explains how we get day and night on Earth.



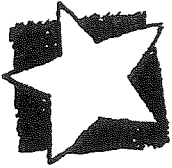
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A C T I V I T Y

**Moon Shapes**

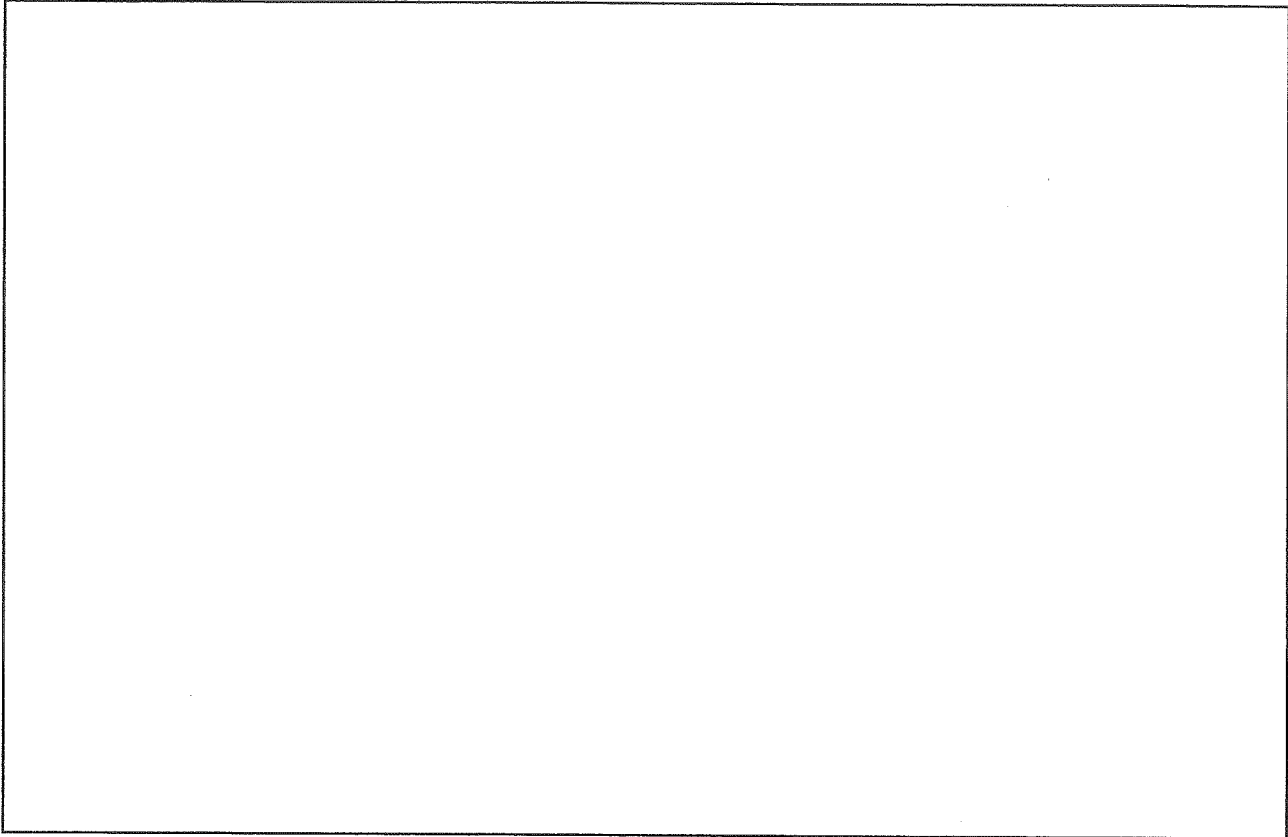
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**4**

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Draw and label a picture of the motion of the moon and Earth. Use arrows to show the motion of the objects. Write a caption for your picture and describe the motion of the Earth and moon.



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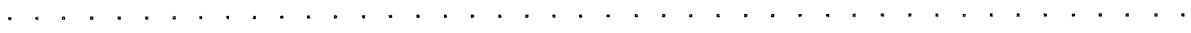
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Name: \_\_\_\_\_

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



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1. Draw and label a picture of the position of the sun, moon, and Earth when the moon appears in the full position. Describe where the lighted side of the moon is facing and where the shadowed part of the moon is facing.

2. Describe what is meant by the phrase, "The moon seems to change."





A C T I V I T Y

**How Big Is It?**

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

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

**5**

**Calvin Learns About the Sun**

1. Do you agree with Calvin's dad when he tells Calvin that the sun sets in Flagstaff, Arizona? \_\_\_\_\_

Explain why or why not.

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2. Does the sun go out when it sets? \_\_\_\_\_

Explain your answer.

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3. Do you think the sun is the size of a quarter? \_\_\_\_\_

Explain your answer.

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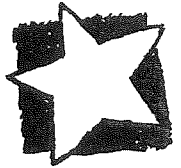
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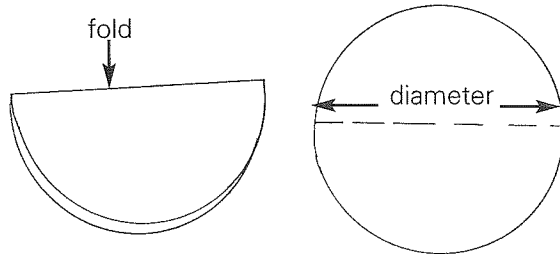
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Name: \_\_\_\_\_



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

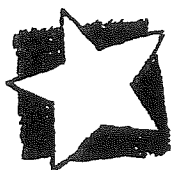
1. Fold the circle in half. The folded line is the diameter of the circle.
2. Draw and measure the diameter of the circle. Record your measurement on the chart. Remember to label your measurements in centimeters. (cm)



Item	Distance Measured
Actual measurement of diameter of circle	
Distance to far corner of room from your work station	
Appeared measurement of diameter of circle	

3. Locate a far corner of the room. Use the measuring tape to measure the distance from your workstation to the new location. Record the distance on your chart. Use meters and centimeters for your unit of measurement.
4. Have one partner stand in the far corner and hold up the circle so you can see it. Line up the metric ruler with the diameter of the circle at a distance. What does the diameter appear to measure from a distance? Record your measurements on your chart.





A C T I V I T Y

**How Big Is It? (cont.)**

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

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

**5**

5. Walk over to your partner and measure the diameter of the circle. Has the diameter of the circle changed? \_\_\_\_\_

6. Write a statement about the difference in the actual measurement of the diameter of the circle and what appears to be the measurement of the diameter of the circle at a distance.

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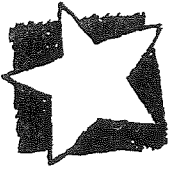
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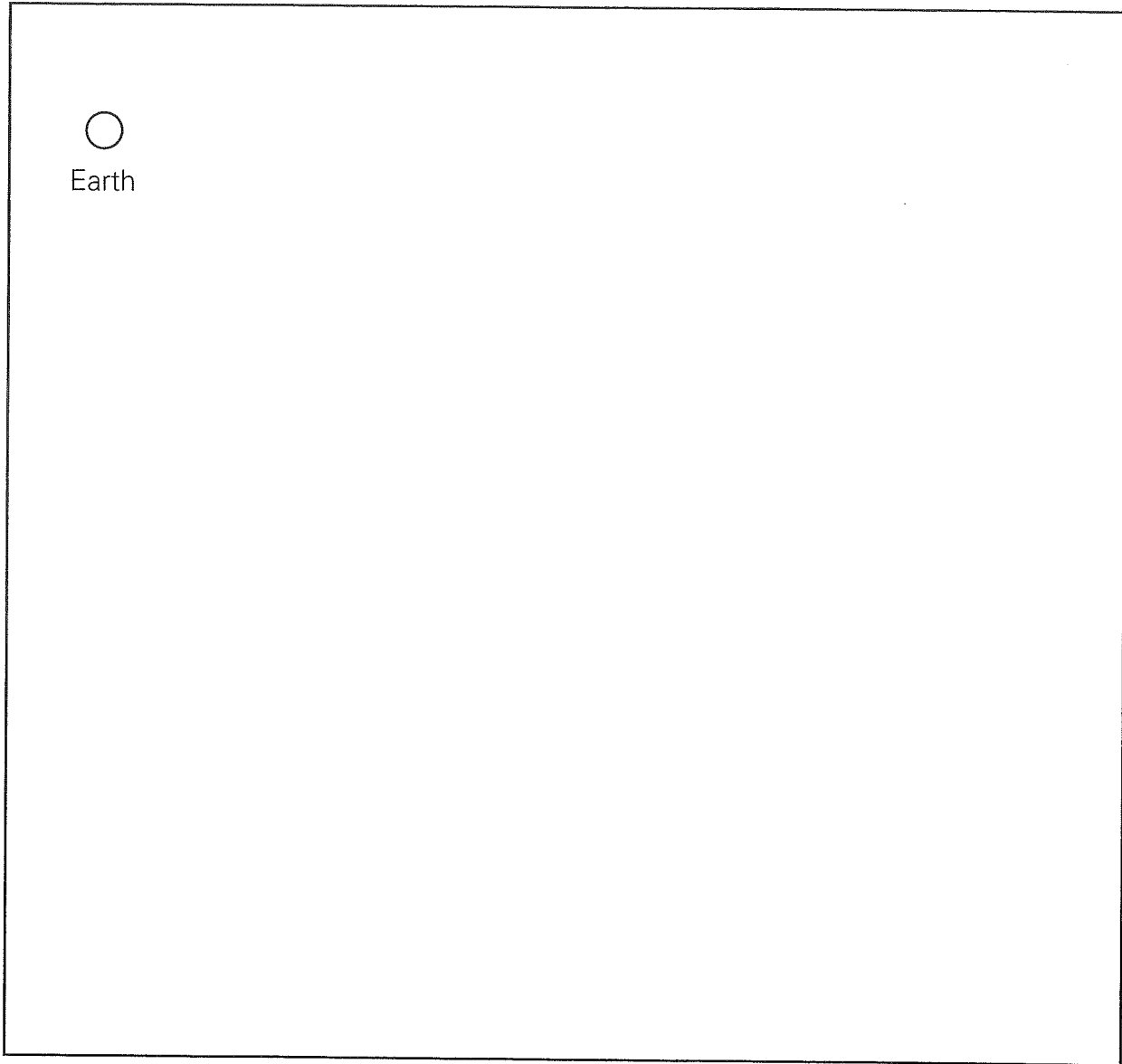
Name: \_\_\_\_\_

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

# 6

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1. The distance from the Earth to the moon is 30 diameters of the Earth. Measure the diameters of the Earth in the picture and use a ruler to measure the diameter of the Earth. Draw the location of the moon on the picture.



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



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

6

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2. Write how the scaled model of the moon and Earth demonstrates the size and distance of the moon and Earth.

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A C T I V I T Y

**Comparing the Sun, Moon,  
and Earth**

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

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

**7**

**Informational Text Reading Strategy**

Topic or your research: \_\_\_\_\_

Name of resource: \_\_\_\_\_ Pages read: from \_\_\_\_\_ to \_\_\_\_\_

Type of reading: story informational technical

- Read for 10 minutes
- Share with your team the information in the section you just read.
- Write notes in the space below:

Look at your notes. Choose the key ideas and write them in the space below. (Use bullets.)

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

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

A C T I V I T Y  
**Comparing the Sun, Moon,  
and Earth (cont.)**



**7**

**Informational Text Reading Strategy**

Topic or your research: \_\_\_\_\_

Name of resource: \_\_\_\_\_ Pages read: from \_\_\_\_\_ to \_\_\_\_\_

Type of reading: story informational technical

- Read for 10 minutes
- Share with your team the information in the section you just read.
- Write notes in the space below:

Look at your notes. Choose the key ideas and write them in the space below. (Use bullets.)





A C T I V I T Y

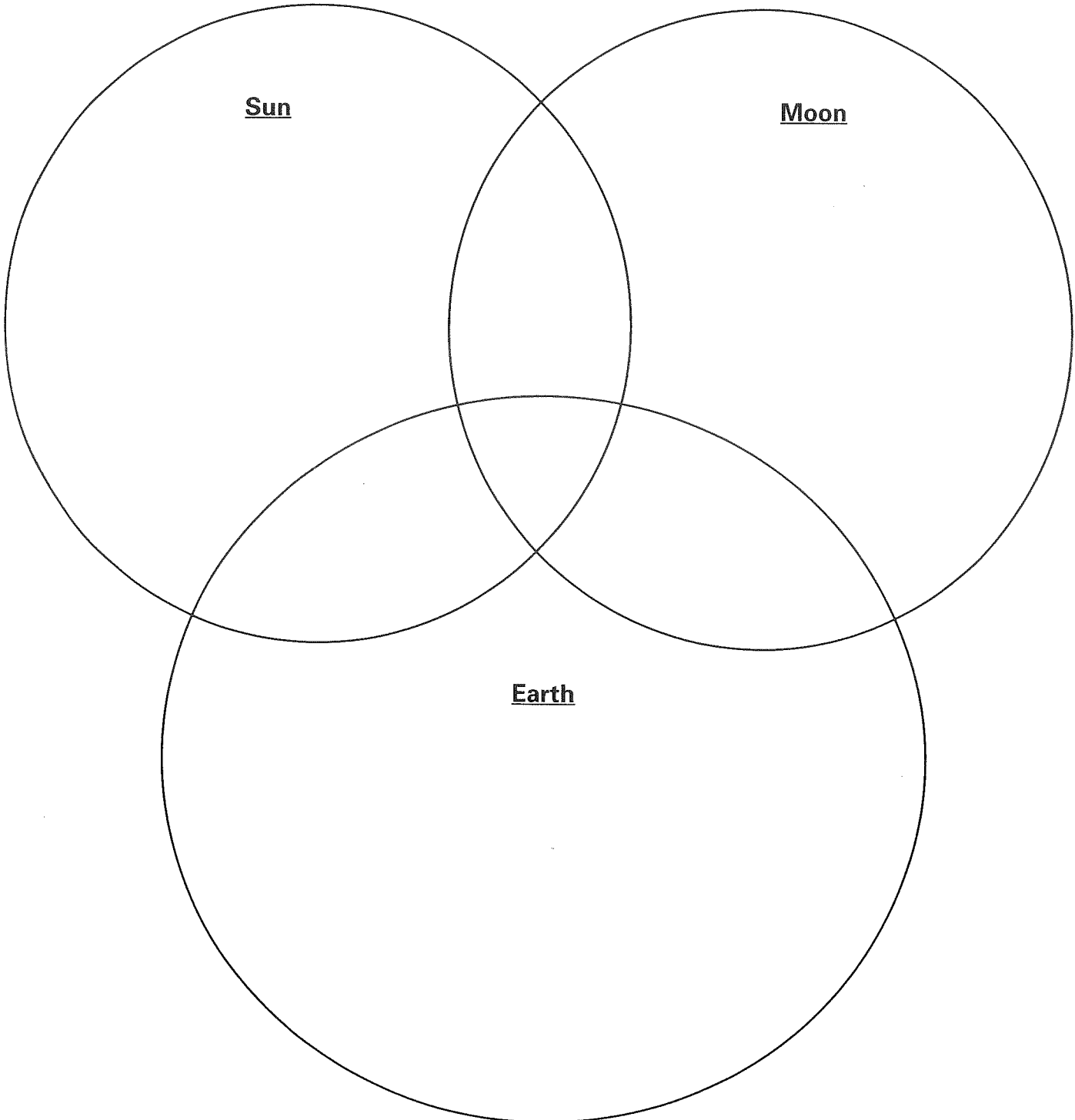
**Comparing the Sun, Moon, and Earth (cont.)**

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

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

**7**

**Comparing the Sun, Moon, and Earth**







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

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

**7** .....

### The Herschel Family: Astronomers

William Herschel was born in Germany in 1738. When he was 19 years old, he moved to England where he worked as a professional musician. He also spent time on his favorite hobby, which was astronomy. He loved to study the nighttime sky.

William built his own very large telescope so he could study objects in space. Using his telescope, he discovered what he thought was a comet. It turned out to be a new planet that was later named Uranus.

William was honored for his work in astronomy by the royal family of England. He was made a knight and awarded enough money so that he no longer had to work as a musician. The money from this pension allowed him to continue his work in astronomy, to build even larger telescopes, and to make more discoveries in the sky.

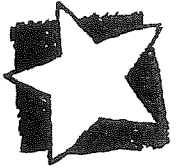
William's sister, Caroline Lucretia Herschel, was also a professional musician who was interested in astronomy. After William was appointed King George III's astronomer, Caroline was hired by the king as William's assistant. She recorded William's observations and made calculations for him. After William died, Caroline continued to catalogue over 3000 stars and other objects in the nighttime sky, contributing to her family's achievements. For her work she was awarded a gold medal by the Royal Astronomical Society.

John Herschel, William's son, made another contribution to his family's discoveries. Using observations of the movements of known planets, John helped prove that another planet with its own moon existed in our solar system. The planet was later named Neptune.

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

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

B I O G R A P H Y  
**Comparing the Sun, Moon, and  
Earth (cont.)**



7

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List the contributions made by each member of the Herschel family to the field of astronomy.

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A C T I V I T Y

**Solar Dance**

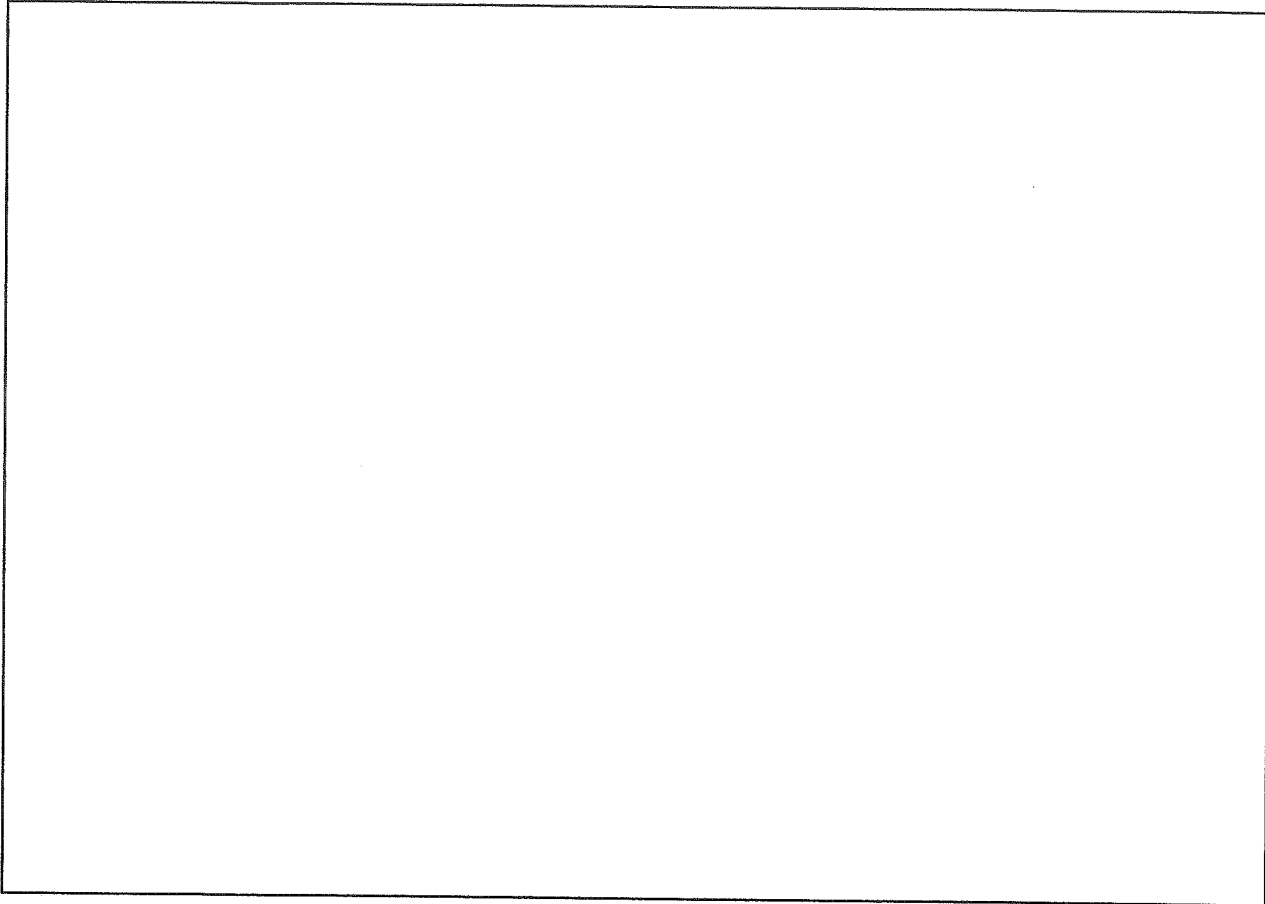
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Date: \_\_\_\_\_

**8**

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Draw and label a model of the movement of the Earth and moon that includes the sun.  
Write a caption for your drawing that includes the time it takes for the Earth and moon to complete one orbit and one spin.



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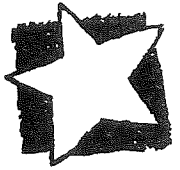
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Name: \_\_\_\_\_



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

8

1. If you are 5 years old, how many times has the Earth orbited around the sun during your lifetime? How do you know that?

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2. If you are 5 years old, how many months have you been living? (Hint: There are 12 months in a year.) \_\_\_\_\_

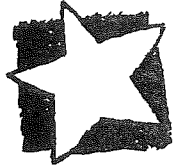
Complete the chart based on your own age:

Your Age	Number of times the Earth has orbited the sun	Number of times the moon has orbited the Earth



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

A C T I V I T Y  
**The Sun and the Seasons**



**10**

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

- .....
1. Draw and label a diagram of the model your group made to explain the changes in the seasons.

2. Write what you think is happening.

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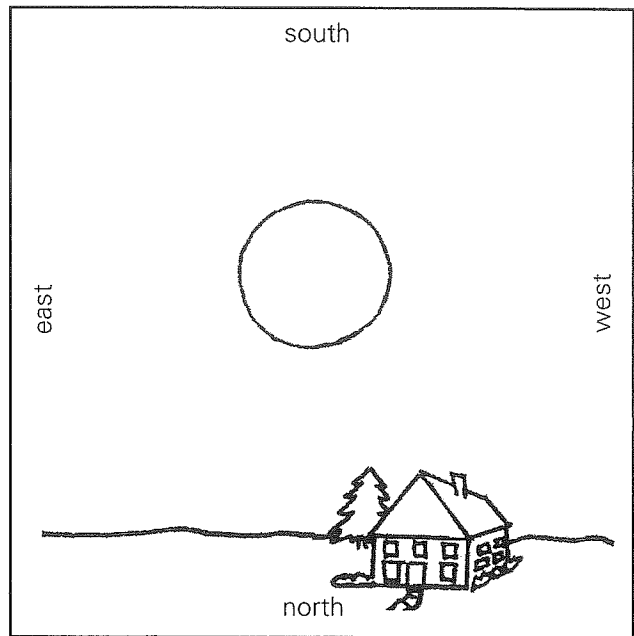
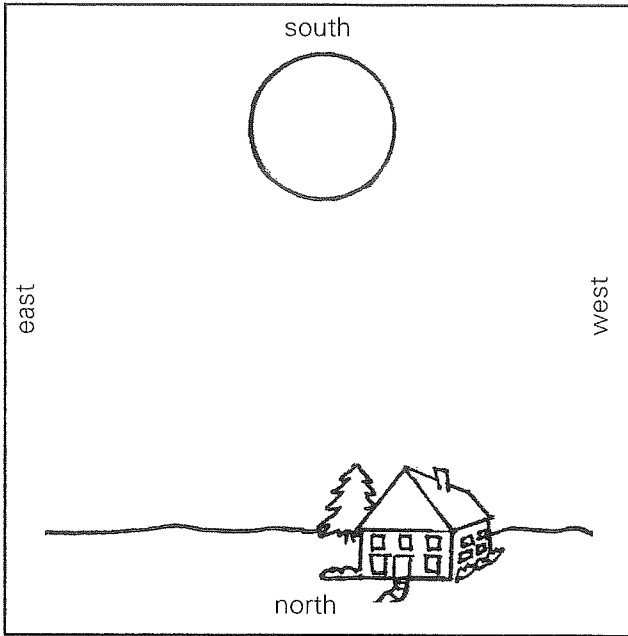
Name: \_\_\_\_\_

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

# 10

Stan and Derek were collecting observation data about the apparent position of the sun in the sky over a 6-month period. Stan and Derek used their fists to measure how high the sun appeared in the sky at noon each day. They used the horizon as their point of reference. They noticed that when they started collecting their data, the sun appeared to be 10 fists high in the sky and when they concluded their observations, the sun appeared to be only 4 fists high in the sky.

Look at the pictures of the sun at 10 fists high and 4 fists high. Label the season for each picture. Explain how you know the season using the position of the sun. Include in your explanation why the sun appears to change position from high to low in the sky.



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

A C T I V I T Y

# What Can We Learn From Layers of Rock and Fossils?



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

11

## My Rock Story

Write a story about your rock. Be sure to include descriptive words, measurements, illustrations, and your personal ideas about your rock.

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A C T I V I T Y

What Can We Learn From Layers of Rock and Fossils? (cont.)

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

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

11

Does My Rock Tell of Long Ago?

1. What imprints or objects are in the rock? (Describe what you see.)

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2. Do you think the imprints are remains of ancient life forms?

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3. Compare what you see to modern life forms you know about. What do you think it might be?

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4. What evidence do you have that makes you think that?

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5. How do you think the imprint or object got into the rock?

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6. What does the material look like that surrounds the object or imprint?

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7. Compare the surrounding material to modern earth material. Does it look like anything you know about?

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8. Why do you think the rock is the size it is?

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9. Why do you think the rock is the shape that it is?

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

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



**Rock Layers Tell About the History of the Earth**

1. Draw the model of the Earth's rock layers. Label the oldest rock layer and the youngest rock layer.

2. Explain how fossils found at different layers help scientists tell about the history of the Earth.

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**What Can We Learn From Layers of Rock and Fossils? (cont.)**

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

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

**11** .....

Use the following words to write a paragraph explaining how fossils and rock layers give evidence about life on Earth millions of years ago: *fossils, ancient life forms, modern life forms, rock layers, extinct, evidence.*

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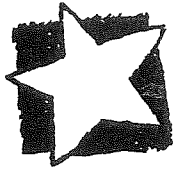
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Name: \_\_\_\_\_



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

1. What question are you investigating?

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2. What do you think will happen?

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3. Draw and write how you will make a model of the rock layers to determine what happens to plant and animal material that is between the layers.

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4. Make a list of the materials you will need to make the model. Include the material you will use to make the rock layers.



A C T I V I T Y  
**Fossil Layers (cont.)**

**12**

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

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

5. Draw and label a picture of your model.

6. Write how your model demonstrates how fossils are made between the rock layers.

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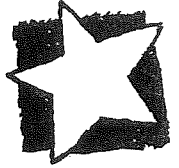
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Name: \_\_\_\_\_



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

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1. Draw and label a picture of rock layers of the Earth that includes fossils.

2. Tell which layers and fossils are the oldest and which are the youngest.

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A C T I V I T Y

**What Can We Learn From Our  
Weather Observations?**

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

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

**14**

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1. What weather data is your team exploring to find patterns or trends? (temperature, cloud cover, wind speed, wind direction, precipitation)

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2. Write the question you are investigating.

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3. Make a chart that shows the weather data you are exploring.

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

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

A C T I V I T Y  
**What Can We Learn From Our  
Weather Observations? (cont.)**



14

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4. What can you conclude from your data?

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5. What other weather data do you think is related to the data you explored?

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6. Write what you found out using the data from the *Weather Observation Log*.

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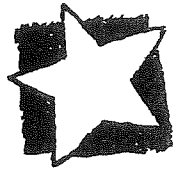
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Name: \_\_\_\_\_

ACTIVITY  
**Our View From the Earth Report**



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

15

**Earth Report Product Descriptor**

<b>Your Earth Report newspaper must include:</b>	<b>Yes</b>	<b>No</b>
1. Newspaper title		
2. School name		
3. Date		
4. Name of reporters		
5. At least one article that compares the sun, moon, and Earth to include:		
relative size - from largest to smallest		
relative distances		
shape		
ability to support life		
ability to produce light		
6. At least one article that explains the motion of the Earth and moon and how it defines a day, month, and year to include:		
the motion of the Earth around the sun.		
the motion of the spin of the Earth.		
the motion of the moon around the Earth.		
the moon phases.		
the appearance of the sun and moon moving across the sky.		
7. At least one article that explains what scientists learn from fossils to include:		
where fossils are found.		
how fossils give evidence of the history of the Earth.		
8. At least one weather report to include:		
temperature		
cloud cover		
precipitation		
wind speed		
wind direction		
the changes in weather over the seasons.		



## Key Terms

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**ability to support life** - The ability to support life refers to the conditions and elements necessary for organisms to survive. (air, water, food, light)

**ancient life forms** - Ancient life forms are very old. They existed many thousands and millions of years ago.

**apparent movement** - Apparent movement is the appearance of motion. The sun and moon appear to move across the sky but it is the rotation of the Earth that gives the apparent motion.

**breathable atmosphere** - Breathable atmosphere refers to the combination of gases in the air that can support life.

**calendar** - A calendar is a way of dividing time into days, months, and years.

**capable** - Capable is to have the qualities or ability to do something. The Earth is capable of supporting life.

**cloud cover** - Cloud cover tells how much of the sky has clouds. Cloudy, non-cloudy, and fog are words to tell about cloud cover.

**cycle** - A cycle is a series of events that repeat over and over. The moon phases are a cycle.

**data** - Data is information about something that can be used to find out about different ideas.

**day** - A day is the amount of time it takes for the Earth to spin around one complete turn.

**diameter** - A diameter is the distance across the center of a circle or sphere.



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**Earth** - The Earth is the planet on which people live. It is a sphere that orbits the sun.

**Earth's axis** - Earth's axis is an imaginary straight line that runs through the North and South Poles. The Earth rotates or spins on its axis.

**evidence** – Evidence is what is observed, read, or discovered and supports an idea or fact.

**extinct** - An extinct plant or animal once lived on the Earth but has died.

**fossil** – A fossil is the remains or evidence of a plant or animal that lived long ago.

**modern life forms** - Modern life forms are plants and animals that exist right now or have existed within modern history.

**month** – A month is the approximate amount of time it takes the moon to orbit the Earth, about 29 days. Calendar months fall between 28 and 31 days.

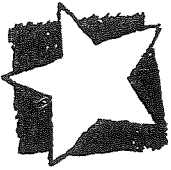
**moon** – The moon is a rock satellite that orbits the Earth. It is the brightest object in the Earth's night sky. The moon does not produce its own light, but reflects light from the sun.

**moon phase** - The moon phase, or phases of the moon, is the visible part of the moon that reflects the sun and is visible from Earth.

**natural satellite** - A natural satellite refers to orbiting objects that are not man-made. The moon is a natural satellite of Earth.

**night** - Night occurs when that part of the Earth is turned away from the sun and it is darker outside.





## Key Terms (cont.)

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**observation** - Observation is to look at something closely, using the senses to find out about it.

**orbit** – To orbit is to move completely around another object. The Earth orbits the sun in one year and the moon orbits the Earth in 29 1/2 days.

**point of reference** - A point of reference is a background or non-moving object in the background used in describing the motion of another object.

**precipitation** - Precipitation happens when water in some form falls from clouds to the ground. Rain and snow are examples of precipitation.

**produce light** - Produce light refers to the ability to generate its own light. The sun produces light. The Earth and moon reflect light.

**reflect** - Reflect refers to the return of light rays from the sun off the moon. The light rays from the sun are reflected off the moon's surface.

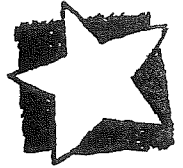
**relative distance** - Relative distance is the measurement of how far one object is compared to another object.

**relative size** – Relative size relates to the comparison of the size of one object to another.

**revolution** - A revolution is the completion of one orbit around a center. The Earth completes one revolution around the sun in one year. The moon revolves around the Earth in 29 1/2 days.

**rock layers** – Rock layers are layers of rock formed over millions of years. Fossils are found in some rock layers.

**rotation** - A rotation is the completion of one spin or turn around its axis. The Earth completes one rotation in one day.



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**season** - A season is one of four quarters into which a year is commonly divided.

**severe weather** - Weather that could be dangerous to living things is called severe weather. People need to follow safety rules to protect themselves during this type of weather. Blizzards, thunderstorms, and tornadoes are examples of severe weather.

**spin** - To spin is to make one complete turn. The Earth spins one complete turn in one day.

**sun** - The sun is the nearest star to the Earth. It is a sphere of burning gases. The sun gives off heat and light.

**temperature** - Temperature is a measurement of how hot or cold something is. Temperature is used to help describe weather.

**thermometer** - A thermometer is a tool that measures how hot or cold something is. The thermometer measures temperature.

**tilt** - To tilt is to move or shift so as to slant or tip.

**visible shape** - Visible shape of the moon refers to the shape of the moon that is visible from Earth.

**volume** - Volume is the amount of space an object or substance takes up.

**weather** - The weather is a description of what happens in the air over the surface of the Earth. Wind, precipitation, cloud cover, heat, and storms are all part of weather.

**week** - A week is the time it takes for the Earth to spin seven complete times. A week is 7 days.

**wind** - Wind is air that is moving. Calm, breezy, and windy are some words used to describe wind speed.



## Key Terms (cont.)

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**wind vane (windsock)** - A wind vane (windsock) is a tool used to measure wind direction. Wind direction is described by the direction from which it blows.

**year** – A year is the time it takes the Earth to orbit one complete time around the sun. A year is about 365 days.