LETTER TO FAMILY

Cut here and paste onto school letterhead before making copies.

Science News

Dear Family,

We are about to begin a study of objects in the sky—the Sun, Moon, and planets. We'll start with the Sun and use a variety of tools to observe and record its position in the sky. To orient our observations, we'll use a compass. And to monitor the Sun, we will use our shadows. While we use the language that the Sun rises in the east and sets in the west, we know that it really isn't the Sun moving but the rotation of Earth on its axis that makes it appear that the stationary Sun is moving across the sky. We will be studying the predictable pattern of the Sun as it travels across the sky during the day and during different seasons.

Then we will study the Moon. We will start as a class by observing the Moon during the day and follow that up with night-sky observations. Since we aren't in school at night, this must be a homework assignment. As a bridge to what we have been studying in class, students will look for the Moon and other objects in the night sky when they are at home.

To make night-sky observations, take your child outside at about the same time each evening (when it's dark) and observe the sky. Take a few minutes to enjoy the night sky together. Talk about what you see. For example, if it's cloudy, you won't see anything but clouds. If it's clear, you will see stars (you might want to point out a constellation or two), planets (points of light that appear larger and brighter than stars), and sometimes the Moon. Discuss the changes in the night sky from night to night, especially the changing appearance of the Moon, and where you see it in the sky. (You can use the Internet or local newspaper to find out when it rises.)

Have your child record his or her observations on the Night-Sky Log (sample below) when I send it home and bring it to school on the following Friday morning. To complete an entry, your child records the date and time. Have your child write a few sentences about what he or she observes and draw a picture to show what the Moon looks like.

Thanks for your help! You can get more information on this module by going to www.FOSSweb.com. And look for the Night-Sky Log coming home soon.

Sincerely,

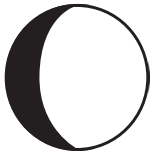
Night-Sky Log

Bring this sheet back to school on Friday morning.

Monday Date February 28 Time 6:20 p.m.

Observations

The Moon was oval. It was high in the sky.
There were lots of stars.
One star in the west was brighter than the rest.



Name _____ Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 1: Sun and Earth

A girl made a Sun tracker and measured the shadows on a day in late December. The table shows the data she collected.

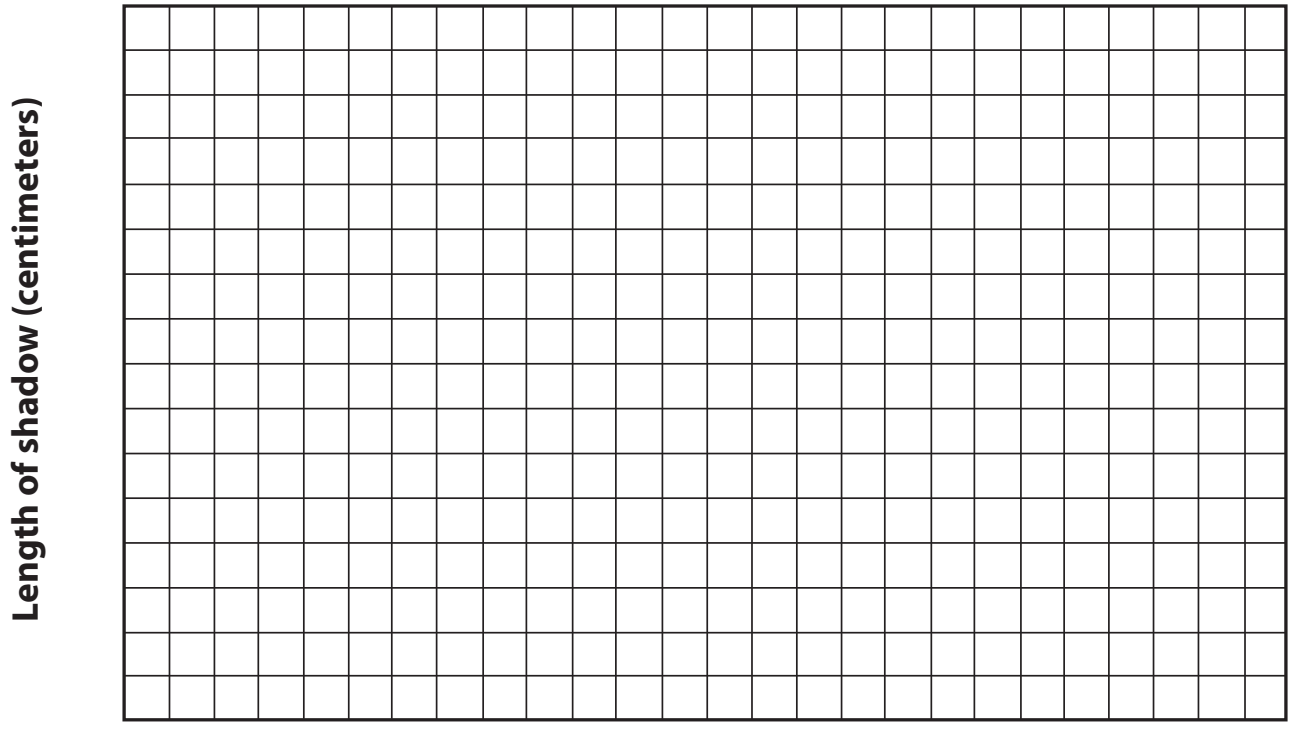
Time	Shadow length (cm)
9:30 a.m.	13.0
11:45 a.m.	8.0
12:30 p.m.	7.5
1:00 p.m.	8.2
1:45 p.m.	10.0
2:15 p.m.	12.0
3:30 p.m.	14.4

Create a graph, using her shadow measurements.

Use your graph to answer the questions below. Use the back of this sheet for your answers.

1. If the girl measures the shadow at 10:00 a.m., what would its length be? How do you know?
2. If she measures the shadow at 5:00 p.m., what would its length be? How do you know?
3. What problems, if any, do you see with her measurements?
4. A boy also set up a Sun tracker on the same day and measured a shadow 10 centimeters (cm) long at 12:00 noon. Could his measurement be correct? Why or why not?

Graph of the Shadow Data



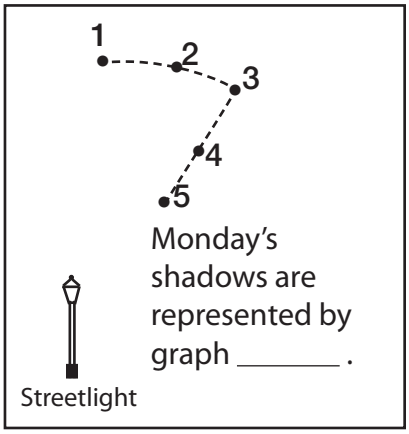
Name _____ Date _____

MATH EXTENSION

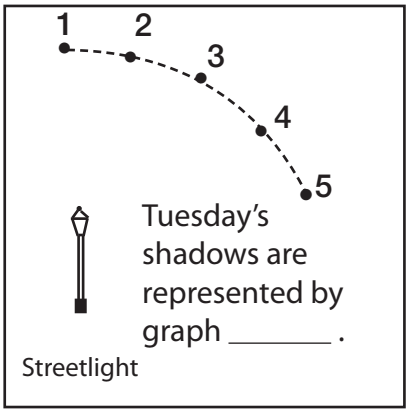
Shadow Graphs

Read the three stories and look at the pictures. Figure out which graph (X, Y, Z) goes with each story. Write the letter of the graph on the line in the picture.

1. Monday night you are standing near a streetlight at position 1. Your friend measures the length of your shadow. It is 4 meters (m) long. You then walk to positions 2, 3, 4, and 5. At each position, your friend measures the length of your shadow.

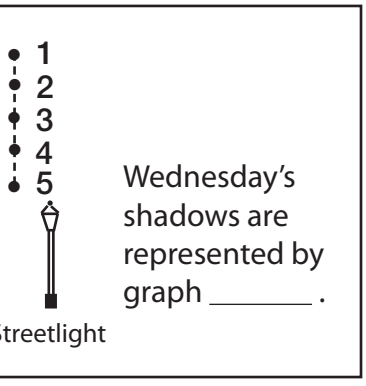


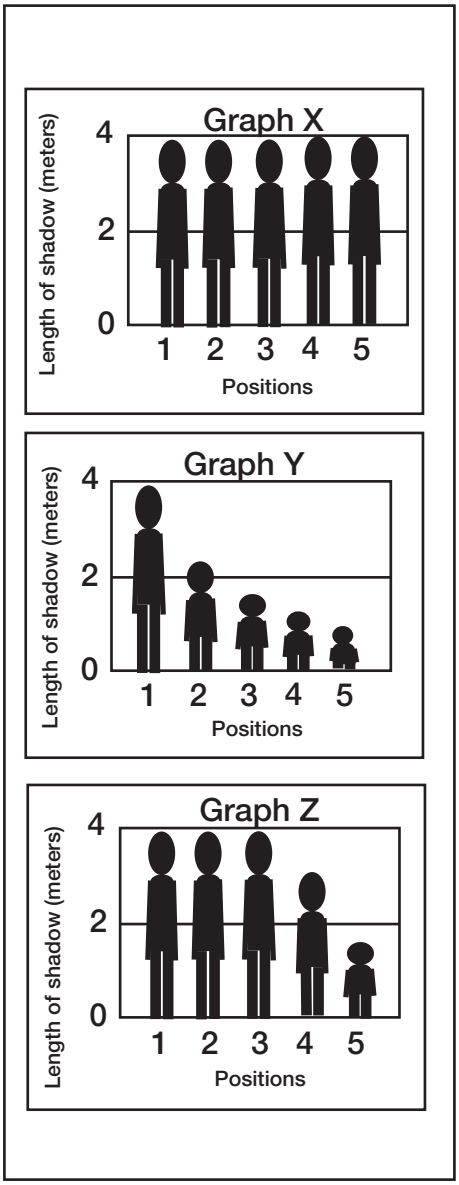
2. Tuesday night you begin from the same place near the streetlight and walk a different path. Your friend measures the length of your shadow at each of the five positions.



3. Wednesday night you start from the same spot but walk in another direction. Again, your friend records the length of your shadow at five positions.

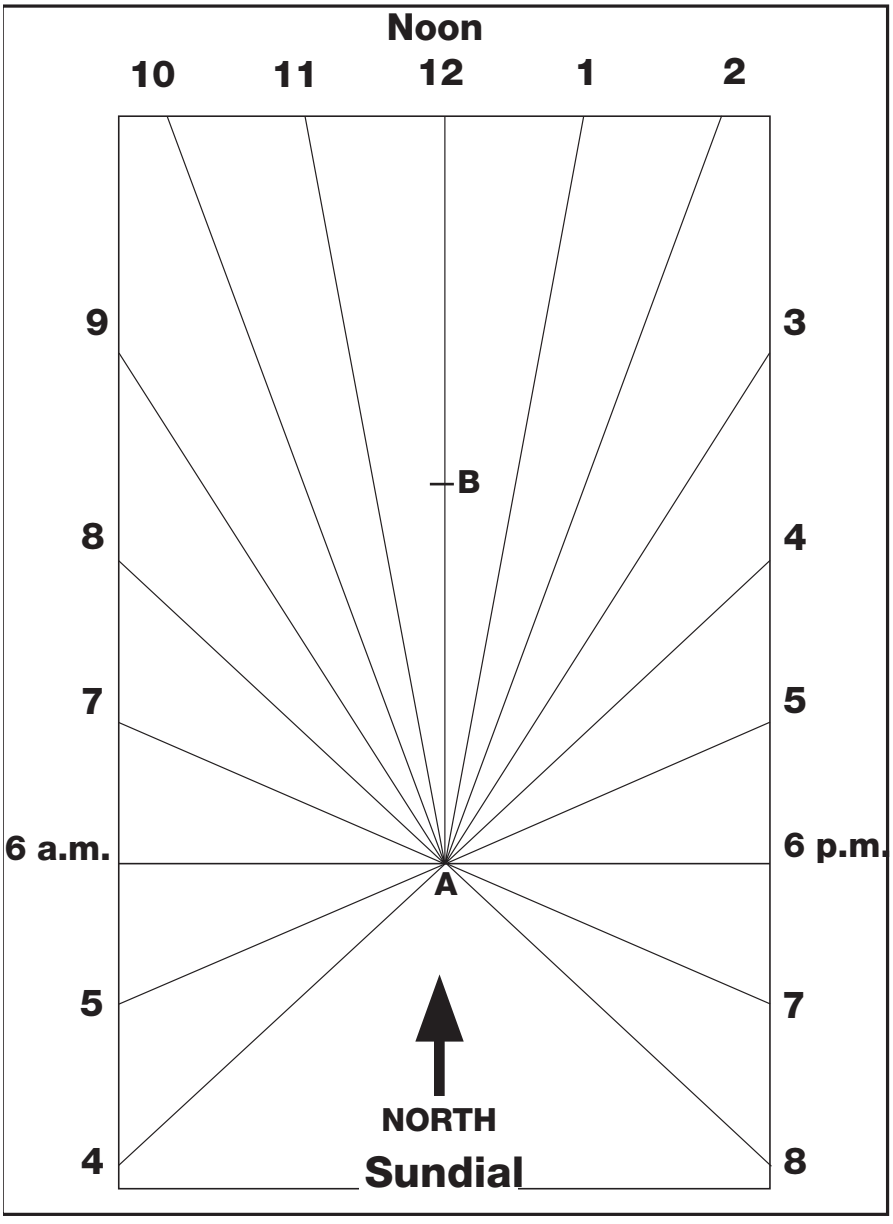
Your friend makes a bar graph of the shadow lengths for each night's walk. Those graphs are shown here on the far right. Match each graph with the path walked each day. Explain your answers on a separate page in your notebook.





HOME/SCHOOL CONNECTION

Investigation 1: Sun and Earth



Sundial Pattern

This sundial will work best at latitude 38° north, the latitude of San Francisco Bay. But the gnomon can be easily modified to fit your area. Find the latitude of your hometown. Then modify angle A on the gnomon to measure that angle.

Materials

- Cardboard
1 Scissors
1 Protractor
- Glue
- Tape

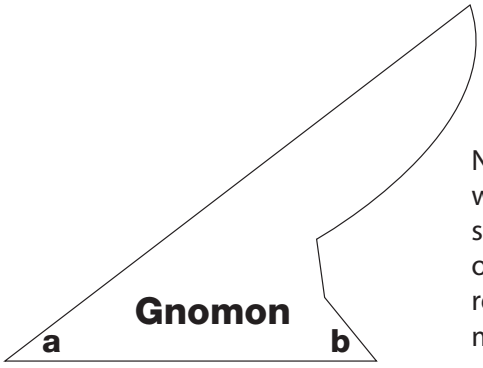
Directions

1. Glue the pattern to a piece of cardboard. Let it dry.

2. Cut out the sundial and the gnomon carefully.

3. Tape the gnomon to the sundial on the 12:00 line, matching angles A and B.

4. Place the sundial outside or in a sunny window. It must be level. Point the 12:00 line and the gnomon directly north. Adjust the sundial by comparing the time you see on the dial with the time on a clock and turning the sundial until the times match. The sundial will now tell time accurately.



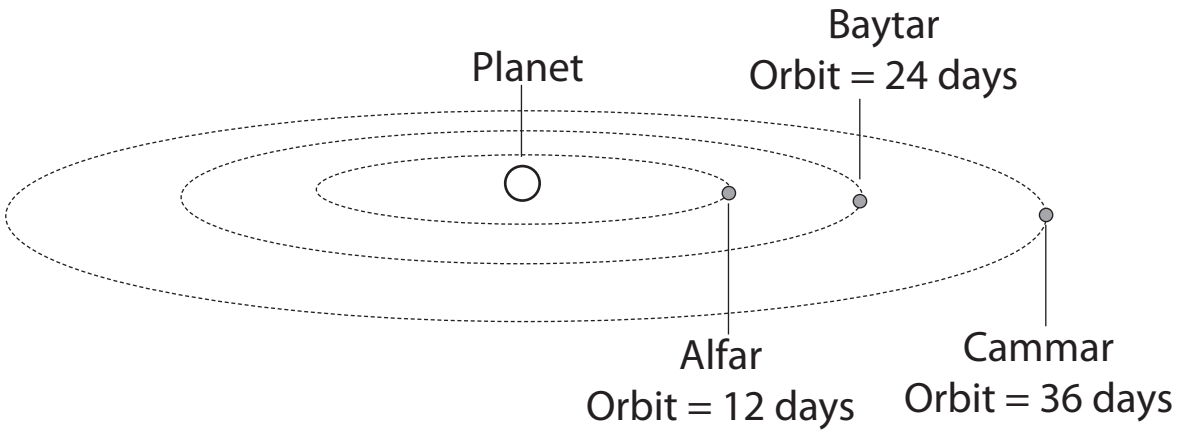
NOTE: Sundials measure local apparent time, which depends on the position of the Sun in the sky. You will need to adjust the time you read on the sundial to get standard time. Check a reference to get the correction factors required to make this adjustment.

Name _____ Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 2: Earth's Moon

In a make-believe planetary system, three moons orbit a planet. The closest moon is Alfar, the middle moon is Baytar, and the moon farthest from the planet is Cammar.



One day the people on the planet noticed that all three moons were lined up.

1. How many months will it be until the three moons line up again?

2. How many orbits will Cammar make before they line up again?

3. How many orbits will Alfar and Baytar make?

HOME/SCHOOL CONNECTION

Investigation 2: Earth's Moon

The full Moon was a monthly beacon in the night sky for Native Americans and early pioneers. Over the years, each full Moon acquired folk names that had seasonal or other significance. Some are obvious, like the Harvest Moon of September. Others are more mysterious, such as the Sap Moon of March. Read through the list of names and try to guess why each full Moon got that name. Most full Moons have two or more names.

Make up your own list of names for the full Moons. Bring your list to school to share.

Month	Folk name
January	Moon after Yule, Old Moon
February	Snow Moon, Hunger Moon, Wolf Moon
March	Sap Moon, Crow Moon
April	Grass Moon, Egg Moon
May	Planting Moon, Milk Moon
June	Rose Moon, Strawberry Moon
July	Thunder Moon, Hay Moon
August	Green Corn Moon, Grain Moon
September	Fruit Moon, Harvest Moon
October	Hunter's Moon
November	Frosty Moon, Beaver Moon
December	Moon before Yule, Long Night Moon

Name _____ Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 3: Solar System

A student, who is 10, is curious about how old she would be on other planets in the solar system. She knows that on Earth a year equals 365 days. But other planets have longer or shorter years. How can she figure out how old she would be on these planets?

Planet	Orbit in Earth days
Mercury	88
Venus	225
Mars	687
Jupiter	4,333
Saturn	10,759
Uranus	30,685
Neptune	60,189

1. How many Earth days old is the student?
2. How many Mercury years old is the student?
3. How many Mars years old is the student?
4. On which planets is the student less than a year old?
5. On which planets is the student older than she is on Earth?
6. How old would you be today on each of the planets?

HOME/SCHOOL CONNECTION

Investigation 3: Solar System

What solar system objects can you see in the night sky? Only one star is a solar system object, the Sun. But it can't be seen in the night sky.

Four solar system objects can be seen easily with your bare eyes at night. They are the Moon, Venus, Mars, and Jupiter. They are brighter than the stars. But you have to know when and where to look for them. They aren't visible all night, every night.

Two more planets can be seen with bare eyes if you know where to look, Mercury and Saturn. They are only as bright as stars.

Look for solar system time and place information in the newspaper or on the Internet. Stardate is a good site. Go to www.FOSSweb.com for the direct link to the stardate website. See how many solar system objects you can find in the night sky.