

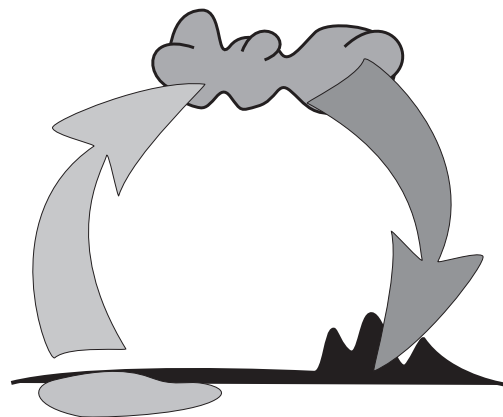
LETTER TO PARENTS

Cut here and paste onto school letterhead before making copies.

Dear Parents,

Our class is beginning a new science unit using the **FOSS Water Planet Module**. We'll begin with a survey of the solar system, finding out about the properties of the planets, moons, comets, and asteroids that orbit our magnificent star, the Sun. We'll ponder how the force of gravity keeps Earth and the other planets in orbit around the Sun.

We will then turn our attention to Earth, the water planet. We'll investigate the variables (temperature and surface area) that affect the evaporation of water and develop explanations for the formation of dew and frost. We'll place containers of water and dry soil in the sunshine to find out if they heat up equally. We'll use the results of these experiments to consider how uneven heating of Earth's surface produces convection currents. These concepts come together in the form of the water cycle, which continually renews the supply of fresh water. Finally we'll develop the big idea of weather.



You can increase your child's interest in Earth's place in the solar system and the importance of water by asking him or her to talk about the science investigations. Keep track of the changes in weather together. Is it a sunny day or cool and foggy? What is influencing the day's weather? Check out the weather maps in the daily newspaper or online or watch the evening news for weather reports. Find out more about where the water that flows from your faucets originates and how it gets to your home.

Watch for Home/School Connection sheets that I will be sending home from time to time. These activities describe ways the whole family can extend our classroom science activities into your home. There will be suggestions for how to locate some of our companion planets in the night sky, activities for investigating evaporation, and more. Your child will have a chance to share his or her experiences with the rest of the class.

We are looking forward to weeks of fun with the solar system, solar energy, and water on planet Earth. If you have questions or comments, or have expertise you would like to share with the class, please drop me a note.

MATH EXTENSION—PROBLEM OF THE WEEK**INVESTIGATION 1: SOLAR SYSTEM**

Jaine, 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
Pluto (dwarf planet)	90,465

1. How many Earth days old is Jaine?
2. How many Mercury years old is Jaine?
3. How many Mars years old is Jaine?
4. On which planets is Jaine less than a year old?
5. On which planets is Jaine older than she is on Earth?

MATH EXTENSION—PROBLEM OF THE WEEK

INVESTIGATION 2: WATER VAPOR

Some students set up an investigation to find out what effect surface area has on the rate of evaporation. They used a cake pan, a water glass, a cottage-cheese container, and an olive jar. They put 100 mL of water in each container.

They measured the water remaining in each container on days 2, 4, and 6. The results of their measurements are in the table below.

Container	Water remaining on		
	Day 2	Day 4	Day 6
Cake pan	75 mL	50 mL	25 mL
Water glass	90 mL	80 mL	70 mL
Cottage-cheese container	80 mL	60 mL	40 mL
Olive jar	95 mL	90 mL	85 mL

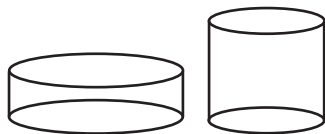
- In which container will all the water evaporate first? _____
Explain how you know.
- If conditions stay the same, on which day will all the water evaporate from this container? Show your math.
- In which container will all the water evaporate last? _____
Explain how you know.
- If conditions stay the same, on which day will all the water evaporate from this container? Show your math.

MATH EXTENSION—PROBLEM OF THE WEEK**INVESTIGATION 3: HEATING EARTH**

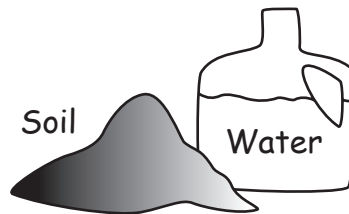
Four students had questions about how earth materials heat up in the sunshine.

1. How does length of exposure to sunshine affect final temperature?
2. How does surface area affect the length of time it takes to raise the temperature 10°C?
3. How does the volume of material in the container affect heating?
4. What kind of material heats up fastest in the sunshine?

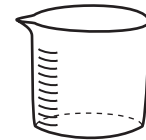
Each student designed an experiment. The students worked with these variables.



Size of container



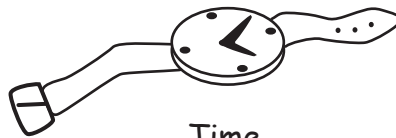
Kind of earth material



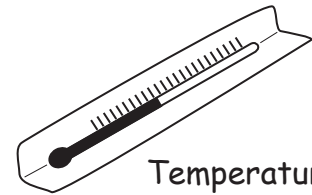
Volume of material



Color



Time



Temperature

Identify the independent, dependent, and controlled variables in each experiment.

Experiment	Independent variable	Dependent variable	Controlled variables
1	Time	Temperature	Size, kind, volume, color
2			
3			
4			

HOME/SCHOOL CONNECTION

INVESTIGATION 1: 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.stardate.org and then go to Stargazing/Planet Viewing. See how many solar-system objects you can find in the night sky.

HOME/SCHOOL CONNECTION

INVESTIGATION 2: WATER VAPOR

INVISIBLE WATER

1. Moisten your forearm with a damp washcloth.
2. Either blow gently on the wet spot or fan your arm with a stiff sheet of paper.
 - How does the wet spot on your arm feel? What happens to the water on your arm?
 - How does sweating help keep your body cool?

NOTE: It takes heat to evaporate water and turn it into water vapor.

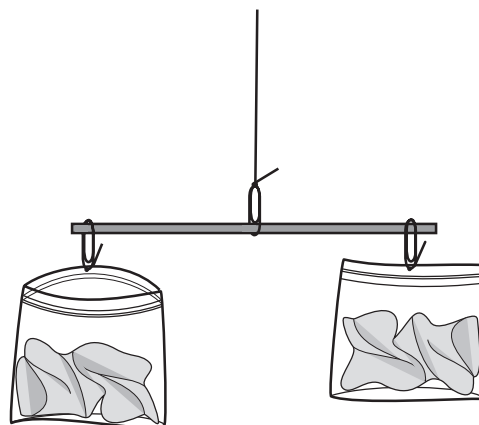
INTO THIN AIR

How fast does water evaporate in your home?

Set up an evaporation gizmo to find out.

You will need

- 1 Plastic soda straw
- 3 Paper clips, regular size
- 1 Piece of string about a meter (3') long
- 2 Plastic bags, identical (Zip-type is nice.)
- 2 Paper towels



Directions

1. Slide a paper clip to the middle of the straw. Tie the string here.
2. Slide a paper clip on each end of the straw. Open up the clips a bit to make hooks.
3. Moisten the paper towels. Put one in each bag. Seal one bag and leave the other open.
4. Hang the bags on the two hooks. Slide things around until you achieve balance.
5. Hang the rig where it can be monitored closely. Observe.

THINK ABOUT HUMIDITY

Where did the water go? The amount of water vapor in the air is called **humidity**. When air contains as much water vapor as it can possibly hold, the humidity is 100%. Warm air can usually hold more water vapor than cool air.

- Watch a weather report or read one in the newspaper. What is the local humidity?
- How could the humidity of the air affect the rate of evaporation?

HOME/SCHOOL CONNECTION

INVESTIGATION 3: HEATING EARTH

Plants depend on solar energy for their survival. They use the Sun’s energy to make food. The food is stored in the plant’s leaves, fruit, and seeds.

People depend on plants for food. When you eat plants, you take in stored solar energy. Your body uses the energy from plants to keep all your systems going.

Plants need different amounts of time in the sunshine to produce the fruits and vegetables we use for food. Here’s one way to look at the amount of solar energy needed to feed you: each day a plant spends in the sunshine growing and storing energy is one sun day. For example, it takes 70 days for a corn seed to grow and produce an ear of corn. When you eat an ear of corn, you are consuming 70 sun days.

Find out how many sun days it takes to prepare your favorite fruits and vegetables for the market. To help you find out how long it takes each plant to produce, look on seed packages, in seed catalogs, and on the Internet. For favorite foods like cereals and breads, you will have to discover the kinds of grains they are made of.

Make a sun-day table. Organize the foods in order from those that need the most sun days to those that need the fewest sun days.

Kind of food	Number of sun days