AMI Day 1
Name: The Scientific Method

What do you do when you have a question and don't know the answer? You might ask a parent or a teacher. You might look for the answer in a book or on the Internet. Sometimes you can't find an answer to your question. You might do an experiment and try to find the answer for yourself.

There are many questions that no one knows the answer to. A scientist's job is to find answers to those questions. Scientists use experiments to help them find the answers. They use the scientific method to help them design better experiments. The scientific method is made up of seven steps.

1.

Do not answer these questions. Just in your head! Make Observations. Look at the world around you. What interests you?

2.

Ask Questions. What questions do you have about what you are looking at?

3. Form a Hypothesis. Choose one question that can be answered with a yes or a no. Make a guess about what you think the answer is.

4. Test Your Hypothesis. Design an experiment that will answer the question you are asking. Make sure it does notanswer any other question.

5. Perform Experiments. Carry out your experiment. Record your results and any observations you make.

6.

Gather Results. Look at all of your results together. What do they tell you?

7.

Reach a Conclusion. Did your experiment prove your hypothesis or disprove it?

The scientific method helps to make sure that scientists find the correct answer to their questions. Scientists aren't the only ones who use the scientific method. Anyone can use it to answer a question or solve a problem.

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1. Name two ways that you might find the answer to a question.

2. A scientist's job is to

A. wear goggles B. do math problems C. answer questions

steps.
3. The scientific method is made up of

A. seven B. five C. twelve

4. Which of the following questions could be used to form a hypothesis?

A. How many different kinds of germs are on my hands? B. Why is the sky blue? C. All of the above

5. If you used the scientific method correctly, you will either prove or disprove your
after you perform your experiments and gather your results. A. observations B. hypothesis C. conclusion

6. Why do people use the scientific method?

AMI Day 2

Name: How Does Geothermal Energy Work?

Geothermal energy comes from the heat inside the Earth. People can use geothermal energy to heat and cool their homes and to make electricity. The Earth's heat is a clean energy source. It does not cause any pollution. It is also renewable energy. We can't use it up. But how does geothermal energy work?

Much of the Earth's heat comes from its core. It is still hot from when the Earth formed over four billion years ago. Heat from the core spreads outward through the earth's mantle, or middle layer. Inside the mantle, rocks are mostly in liquid form, called magma, melted by the Earth's internal heat. Magma heats the water under the ground. In some places, the hot water shoots to the surface in hot springs and geysers. This hot water can power geothermal energy systems.

Iceland is one place where geothermal energy is used to heat buildings and to grow food. That country has about 25 active volcanoes. Hot springs and geysers are common there, too. Water from hot springs is piped into buildings. The buildings are heated by the water passing through pipes and radiators instead of furnaces that burn coal, oil, or gas.

Greenhouses use geothermal energy where it is too cold to grow food outdoors. Inside the greenhouses, there are pipes full of hot water. Hot water is pumped up from underground and used to heat the greenhouses. The hot **water wa**rms both the soil and the air inside the structure. Greenhouses like this are used to grow food in Iceland, Hungary, Italy, and New Mexico.

Many homes in the U.S. are heated with geothermal heat pumps. These use the stable temperatures found in the soil to even outside temperatures. Pipes are placed in the ground about ten feet below the surface near a building. At this depth, the soil temperature stays between 50 and 60 degrees, summer and winter. This means it stays warmer in the winter than the outside air. It stays cooler in the summer, too.

Heat pumps use this warmer or cooler temperature to heat homes in winter and cool them in summer. A liquid is pumped into the buried pipes. In winter, warmth from the ground warms the liquid in the pipes. An electric fan blows over the pipes to heat the rooms of the house. In the summer, the opposite happens. Hot air from inside the house is cooled under the ground. Then it is sent back into the house. The heat removed from the hotter, summer air
can be used to heat water for bathing and washing dishes.

Geothermal heat pumps can keep buildings warm even when it is very cold outside. Many heat pumps are small enough to fit inside a home's basement.

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Name:

1. Where does geothermal energy come from?

2. What are some *g*ood reasons to use geothermal energy*?*

A. It is a clean energy source. B. It is renewable energy. We can't use it up. C. all of the above

3. Greenhouses use geothermal energy to

A. warm the soil B. warm the air inside the greenhouse *C*. both A and B

4. Which country is NOT mentioned in the story as using geothermal energy?

A. Italy B. the United States C. Guatemala

5. Geothermal heat pumps are not practical for use in homes.

A. true B. false

6. Ten feet below the surface, ground temperature stays between

A. thirty to forty degrees B. ten to twenty degrees C. fifty and sixty degrees

7. What can the reader infer about geothermal heat pumps?

A. Geothermal heat pumps ar**e too expensive for man**y people to afford them. B. Geothermal heat pumps cannot be used in places where it gets very cold in winter. C. all of the above

8. What was the author's main purpose for writing this story?

A. to inform readers with facts B. to entertain readers with funny stories about energy C. to persuade readers that everyone should use geothermal energy

AMI Day 3

Name: Food Energy Pyramid

All living things depend on other living things. Plants make their own food. Almost all animals depend on plants for food energy. A food chain or web shows how each type of animal gets its food.

Sometimes food energy is shown as a drawing of a pyramid. The bottom of the pyramid is made up of the producers. Producers or plants produce their own food. Green plants use energy from the sun, along with carbon dioxide and water, to make their own food. This process of photosynthesis makes a form of sugar that plants can use to live and grow. Plants are the producers that make up the base of almost all food chains on Earth.

Carnivores **Herbivores Producers**

Animals are consumers. They consume, or eat, producers. In the energy pyramid, the second layer is made up of herbivores. Herbivore means "plant eater." Herbivores eat only plants.

The next layer up in the pyramid is the carnivores. Carnivore means "meat eater." Carnivores eat herbivores. Some carnivores eat other carnivores. It is possible to have more than one layer of carnivores in a food energy pyramid.

As you go up the pyramid, did you notice that each level gets smaller? There are fewer herbivores than producers. Each layer of the food energy pyramid has fewer individuals than the layer below it. There are fewer carnivores that eat herbivores than there a**re herbivores. There are even fewer**

carnivores th

Why do you think this is so? It is because at every level, most food energy is used up or lost. Only about ten percent of the energy is available to one living thing as it feeds upon the ones below it. Producers use most of the energy they make. They pass on only about ten percent to the consumers that eat them. The consumers, also, only pass on about ten percent of their energy to the next level consumer. The energy pyramid helps us see how energy is passed along between producers and consumers.

Name:

Questions

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1. What is the energy pyramid?

A. a drawing that shows how energy is passed through the food chain B. a drawing that shows us which foods we should eat every day C. a drawing of a food web

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2. The author's main reason for writing this story was to

A. demonstrate how producers help animals B. inform readers C. persuade readers

3. The base or bottom layer of the energy pyramid would be labeled as

4. Which label of the energy pyramid would have the smallest area in the drawing*?*

A. herbivores **B. carnivores** C. producers

5. Herbivores eat

A. only plants B. producers C. both A and B

in an energy pyramid.

. 6. You might find more than one layer labeled

A. herbivores B. producers C. carnivores

AMI Day 4

Name: Do Meteorologists Study Meteors?

A chemist studies chemicals. A psychologist studies psychology. A geneticist studies genes. But does a meteorologist study meteors? The answer is yes! The word meteorologist comes from the Greek word meteor. This word meant high in the air. Today we think of meteors as flaming rocks flying through space. Sometimes they are called "shooting stars" (but they are not stars). Meteorologists do not study flaming rocks, but they do study different kinds of meteors.
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A meteor can be anything that falls through the air. So, raindrops, dust, and snowflakes can be though of as atmospheric "meteors." Scientists have different names for different kinds of weather meteors.

Are there clouds in the sky today? Is it raining? Maybe the sun comes out; now there is a rainbow. It may be snowing or foggy. Precipitation that contains water is called a hydrometeor. Hydro means water, so a hydrometeor is any kind of water falling through the air.

Another type of meteor that meteorologists study is called a lithometeor. Smoke, dust, and haze are examples of this kind of meteor. These particles are known as condensation nuclei. This means that water vapor can cling to them and form clouds.

Lightning and thunder are another kind of meteor. They are called electrometeors. In other words, they are electricity in the air that can be seen or heard.

Meteorology is the study of what is happening in the air or atmosphere. It is the study of the weather and climate. The weather shapes our lives everyday. It affects what we wear and what we do. The climate affects our lives over a longer span of time. But what is the difference between weather and clim

Weather is what is happening in the air at a certain time and place. The weather is always changing. It may be sunny and warm today, but cloudy and rainy tomorrow. It might be cool and cloudy in Ohio today, but cool and sunny in Pennsylvania at the same time. On a hot, sunny, summer day, a thunderstorm might suddenly come up. Dangerous storms like hurricanes, tornadoes, and blizzards are also types of weather. Changes in weather can happen

over minutes, hours, or days.

Climate is a pattern of weather in a certain area over a long period of time. There are many different climates around the U. S. For example, it is always much cooler in Maine than it is in Florida. Washington gets a lot more rain than Nevada. It can snow in June in parts of Colorado. To determine an area's climate, scientists study many things. They gather data on temperatures, amounts of rainfall, wind patterns, humidity, and air pressure. They do this over a period of thirty years or more. This helps them to know what is "normal" for that area.

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To understand the weather and how it affects our climate, meteorologists study many kinds of "meteors." Meteorologists use the data they gather to forecast the weather accurately. Farmers and other people depend on meteorologists' forecasts to plan their daily lives.

Do Meteorologists Study Meteors*?*

Questions

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1. A hydrometeor contains

A. soil B. electricity C. water

2. Meteorology is the study of

A. weather and climate B. psychology C. genes

3. Particles of dust that help form clouds are called:

A. condensation nuclei B. hydrometeors C. fog

4. What is climate*?*

5. What is weather?

6. The weather is always changing.

A. true B. false

AMI Day 5

Name: What Is Matter Made O*f?*

Suppose you are holding a tiny grain of salt from your kitchen. You drop the salt on the floor. Can you find it again? It is hard to see just one little grain of salt. But suppose you spilled a whole box of salt. It would be easy to see, and your mom would tell you to clean up your mess.

Matter is made of tiny little particles, too. The particles that make up matter are called **atoms.** You cannot see atoms because they are so small. Lots of atoms join together to make up matter that you can see.

Scientists know about many kinds of atoms. These atoms can join together in different ways to make different kinds of matter. Some matter has only one kind of atom. This is called an **element. An element** is a substance that is made of only one type of atom. Gold is an element. Many atoms of gold join together to make gold you can see. All the atoms of gold are the same.

Other matter is made up of more than one kind of atom. Two different kinds of atoms join together to make water. These particles are called molecules. A **molecule** is a particle of different kinds of atoms joined together. All the molecules of water are the same.

A water molecule is made of two atoms of hydrogen and one atom of oxygen. You may have heard water called "H 2 O." This is like a recipe for water. Every molecule of water must have two atoms of

hydrogen for every atom of oxygen.

Particles in matter are different in different states of matter. The particles in solids stay close together. They pull toward each other. But they are always moving back and forth. We cannot see the movement because we cannot see the particles. They are too small to see.

The particles in liquids are farther apart than those in solids. The pull between the particles is weaker in liquids than in solids. Liquids change shape because the particles can move around each other.

The particles in gases have an even weaker pull than those in liquids. Gas particles may be far apart. The particles move around even more than in liquids or solids. A gas can spread out to fill any space. That is because its particles can move around freely.

All matter is made of atoms. Atoms can join together to make molecules. Particles in solids are close together and move back and forth. Even though they move, they are joined together by the pull between their particles. The particles in liquids can move around each other. This is why liquids "pour." The particles in gases are far apart and move around freely. The pull between the particles of a gas is too weak to hold them together.
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Name: **Questions**

1. Matter is made of particles called

2. Atoms can join together to make up different kinds of matter.

A. true B. false

3. An
is a substance that is made of only one type of atom.

4. All the atoms of an element are the same.

A. false B. true

5. A/An is a particle of different kinds of atoms joined together.

A. element B. atom C. molecule

6. What do the particles in a solid do?

A. stay close together B. move back and forth C. all of the above

7. Particles in a liquid:

A. are farther apart than in a solid B. move around each other C. all of the above

8. Particles in a gas:

A. move around freely B. stay close together C. all of the above