

Scientific Method

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1 The scientific method is a series of steps that scientists use to guide them as they complete investigations. The scientific method includes the following steps: making an observation, asking a question, researching the topic, forming a hypothesis, planning and completing an experiment, recording and analyzing data and drawing a conclusion. Not all investigations use all of the steps of the scientific method and sometimes the steps can be completed in different orders.

2 The first step in the scientific method requires scientists to use their five senses to make an observation. After an observation has been made, then a question about the natural world needs to be formed. The third step in the scientific method is to do research on the scientific question. Research is very important because it allows a scientist to learn more about the subject. By doing research a scientist is learning from what other scientists have already discovered from their own investigations. Some resources a scientist might use in their research are: books, encyclopedias, the internet or reading a science journal. After a scientist has learned more about their scientific question, the next step in the scientific method is to make a hypothesis. A hypothesis is a testable statement that answers a question. The fifth step in the scientific method is to design and complete an experiment. A scientist designs an experiment by formulating a procedure to test the hypothesis. The procedure is the step by step description of how to complete an experiment. The procedure of an experiment needs to be specific and detailed so that it can be repeated multiple times. While an experiment is being completed, scientists collect data. Recording and analyzing data is the sixth step in the scientific method. At the end of the experiment all the data is analyzed. The data is the evidence that is collected in an investigation. Sometimes the data will support the hypothesis and sometimes it will not. The last step in the scientific method, the seventh step, is to draw a conclusion. The conclusion should determine whether or not the evidence supports the hypothesis.

Name: _____

The Scientific Method

Directions: Use the words from the word bank to fill in the blanks.

Observation
 Information collected using
 Your _____ senses.



Question
 A testable statement that
 is made based on an
 _____.



Hypothesis
 A _____
 statement that tries to
 answer a question.



Research
 Use available resources to
 _____ more
 about a topic.



Experiment
 A _____ and
 accurate test that requires
 variables.



Data
 All the _____ that
 is collected from an
 investigation.



Conclusion
 A decision of whether or
 not the evidence supports
 the _____.

WORD BANK

testable learn
 observations
 fair evidence
 five hypothesis

Science

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1 Science is the study of the natural world and scientists are the people who study the natural world. Scientists study the natural world by making observations and then asking questions about those observations. That means anybody, including you, can be a scientist if they know how to make observations and then turn their observations into scientific questions.

2 Observations are made by using the five senses. Any information that is collected using your senses is considered an observation. After an observation is made an inference can be formed. Inferences are explanations to observations. For example, if you went outside and used your sight to observe that the ground is wet, then you could make an inference that maybe it just rained or maybe the sprinklers were on.

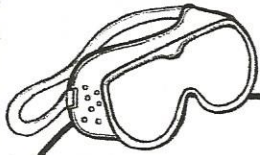
3 Scientists use their observations to develop questions about the natural world. Scientific questions are answered by completing investigations. Investigations are strategic procedures that are completed to learn more about the natural world. A good scientific question can always be answered by an investigation. Investigations should always be completed multiple times to confirm that the results are accurate.

4 Science tools are used in investigations to assist scientists. Science tools can measure length, weight, and temperature. They can also assist scientists in seeing small objects or they can help keep a scientist safe while completing an investigation. There are many uses for science tools, but it is important to remember to always use your science tools correctly and to always follow all safety rules while completing an investigation.

Name: _____

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Science



The study of the natural world.

Information that you collect by using your five senses.

The people who study the natural world.

A logical conclusion that explains an observation.

Strategic procedures that are completed to learn more about the natural world.

• Observation

• Investigation

• Inference

• Science

• Scientists

List your five senses:

1)

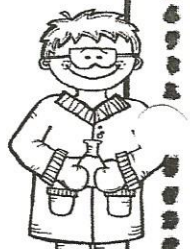
2)

3)

4)

5)

What science tool do you most want to use? Draw a picture of the science tool.



Name: _____

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Science



What is science?

What do scientists do?

What are science tools?

Who can be a scientist?

Where do you do science at?





Draw a scientist.



DIRECTIONS: Circle the best answer.

Name _____

1. Which object will a magnet attract?

- A. 
- B. 
- C. 
- D. 

2. What are the two poles on a magnet?

- A. north and south
- B. east and west
- C. north and west
- D. south and east

3. What happens when the OPPOSITE poles of two magnets come near each other?

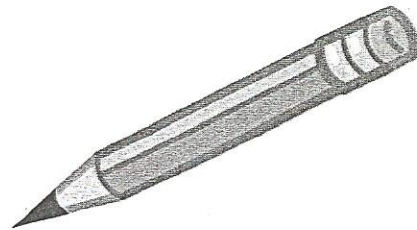
- A. The magnets push away.
- B. The magnets pull together.
- C. The magnets get bigger.
- D. The magnets disappear.

4. Which is TRUE about magnets?

- A. They can attract anything metal.
- B. They can attract aluminum cans.
- C. They can pull through liquids.
- D. They can repel pennies.

5. What happens when two magnets repel each other?

- A. Their magnetic fields get bigger.
- B. They come closer together.
- C. They push away from each other.
- D. They point to the North Pole.



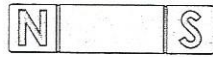
Name: _____

Magnetic Attraction

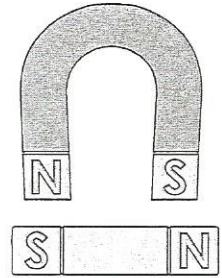
Tell whether each pair of magnets will attract or repel.



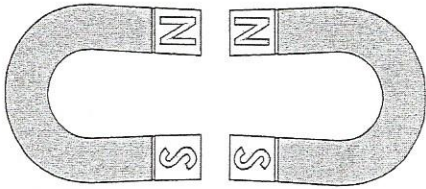
attract repel



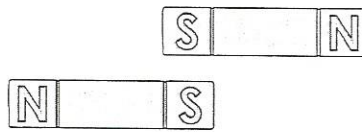
attract repel



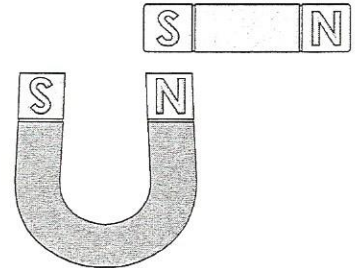
attract repel



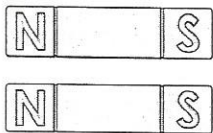
attract repel



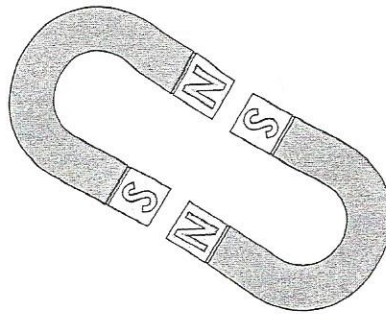
attract repel



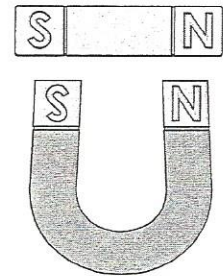
attract repel



attract repel



attract repel



attract repel

Sink or Float Easy Quiz

DIRECTIONS: Circle the best answer.

Name _____

1. What will happen if you add 2 ice cubes to a cup of water?

- A. The water level will go up.
- B. The water level will go down.
- C. The water level will stay the same.
- D. The water will boil.

2. Which object will float in a tub of water?

- A. an iron weight
- B. a heavy rock
- C. a flat, thin leaf
- D. a solid gold statue

3. Which object will sink in a bowl of water?

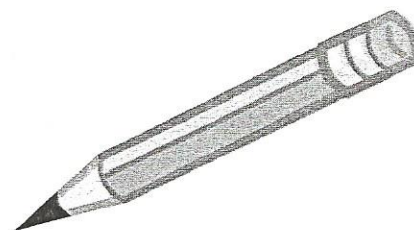
- A. a pencil
- B. a gold ring
- C. an apple
- D. a balloon

4. Many HOLLOW objects like an empty box, soda can, or bottle float. What does HOLLOW mean?

- A. very heavy
- B. full of food
- C. full of liquid
- D. full of empty space

5. Which sentence is TRUE?

- A. Small objects always float.
- B. Big, heavy objects always sink.
- C. An object sinks if it is heavier than the water it pushes away.
- D. When an object floats, it falls to the bottom.



Why Does Matter Matter?

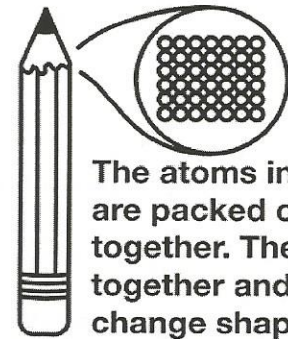
by Kelly Hashway

What do trees, air, and water have in common? They all have matter. That means they take up space. You might be wondering why these things look so different if they all have matter. Everything found on Earth can be grouped into one of three states of matter: solid, liquid, or gas. In order to figure out which state of matter an object fits in, we have to examine its properties. The properties we look at are shape, mass, and volume. Mass is the amount of matter an object has, and volume is the amount of space the matter takes up.

Solids are easy to recognize. They have definite shape, mass, and volume. Trees are solids. They are made up of tiny particles called atoms. These atoms are packed closely together, and they hold the solid in a definite shape that does not change. If you look around your house, you will see lots of solids. Televisions, beds, tables, chairs, and even the food you eat.

Liquids do not have definite shape, but they do have definite mass and volume. Liquids are similar to solids because their atoms are close together, but what makes a liquid different is that those atoms can move around. Liquids can change shape by flowing. If you've ever spilled a glass of milk, then you know it spreads out across the floor. It does this because the milk is taking the shape of the floor. Since liquids do not have a definite shape of their own, they will take the shape of their containers. This is why the same amount of milk can look different in a tall glass, a wide mug, or spread out on your kitchen floor.

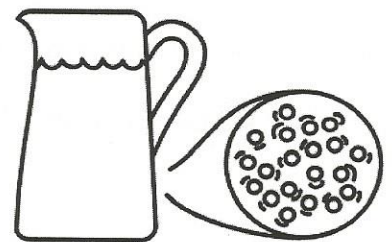
Solid



The atoms in a solid are packed closely together. They bond together and do not change shape.

Liquid

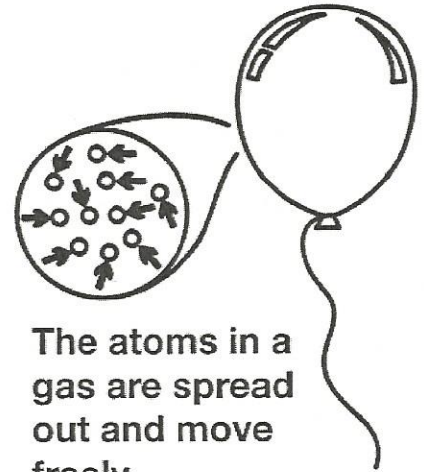
The atoms in a liquid are close together. They slide around.



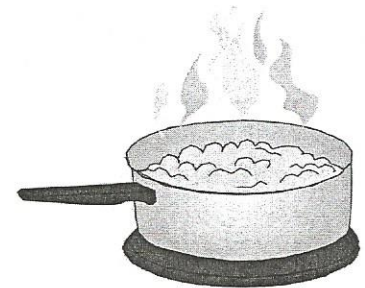
Gases do not have definite shape or volume. Like liquids, gasses will take the shape of their containers. If a gas is not in a container, it will spread out indefinitely. This is because the atoms in a gas are spaced farther apart than in a solid or a liquid. And being spread out like this allows them to move around freely. Think about the air you breathe everyday. That air is spread across the empty space around the earth. You've probably also noticed that you usually cannot see the air. This is another property of gases. Even though we cannot see them, you come in contact with them everyday. There's air in the tires of your family car and your bicycle. There are many different types of gas in the earth's atmosphere, such as oxygen, carbon dioxide, nitrogen, water vapor, and helium.

When trying to remember the three states of matter, think about water. If it freezes into a solid, it becomes ice. Its atoms are packed together keeping its shape. Of course, we know water can also be a liquid. It flows in rivers or it can be poured from a glass. When water evaporates it becomes water vapor, a type of gas in the air. Try a little experiment of your own by placing an ice cube in a covered glass or container. You will be able to observe the ice first in its solid form and then watch as it melts into a liquid to become water. Eventually the water will turn to water vapor and your glass or container will be filled with this gas.

Gas



The atoms in a gas are spread out and move freely.



You can see three different states of matter in this picture. The pot is made of solid matter. The water inside the pot is liquid. When the liquid is heated it becomes water vapor, which is a gas.

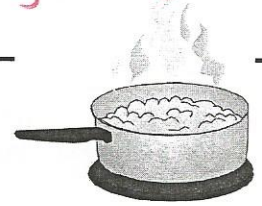
Matter is everywhere! Can you find a solid, a liquid, and a gas around you right now?

Name: _____

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Why Does Matter Matter?

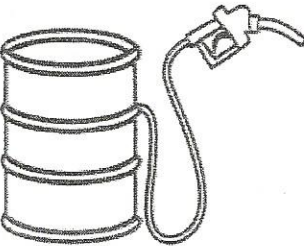
by Kelly Hashway



solids	volume	container	matter	ice	juice
gases	mass	atoms	chair	oxygen	melting
liquids	shape	space	milk	helium	

Choose a word from the box to complete each sentence.

1. The three basic properties of matter are _____,
_____, and _____.
2. All matter is made up of tiny particles called _____.
3. Volume is the amount of _____ that matter takes up.
4. Mass is the amount of _____ an object has.
5. Liquids take the shape of their _____.
6. _____ do not have a definite shape or volume.
7. _____ do not have a definite shape, but they do have a definite volume.
8. _____ have a definite shape and volume.
9. A _____ and _____ are examples of solids.
10. _____ and _____ are examples of liquids.
11. _____ and _____ are examples of gas.
12. Solid ice is _____ when it is changing into a liquid.

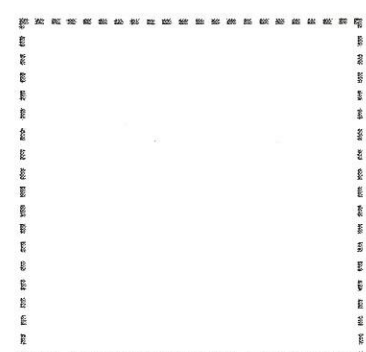
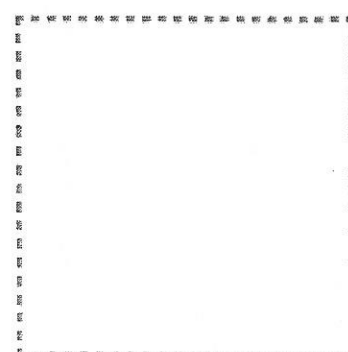
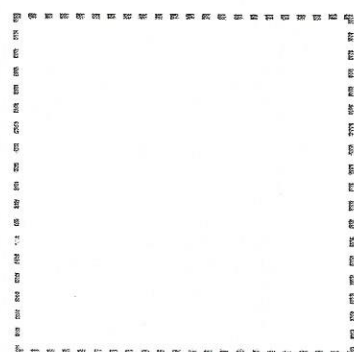
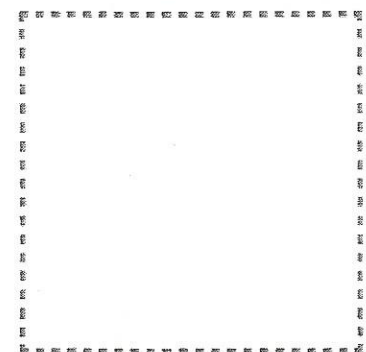
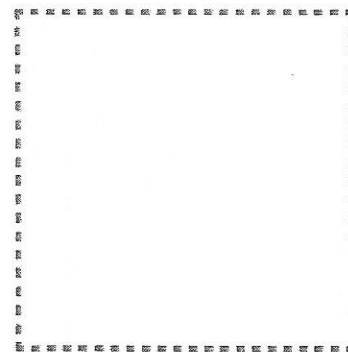
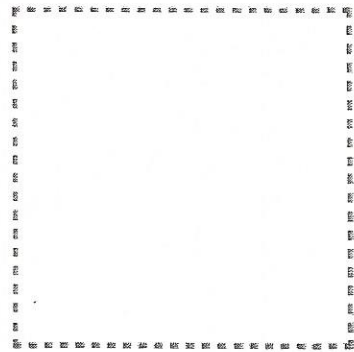
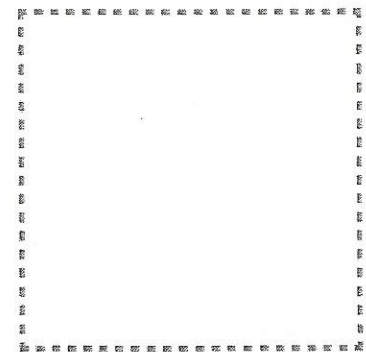
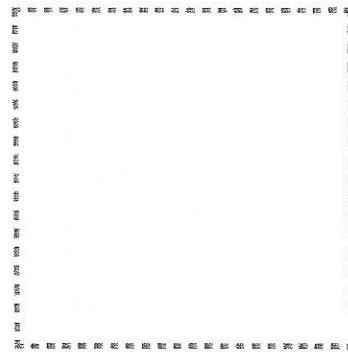
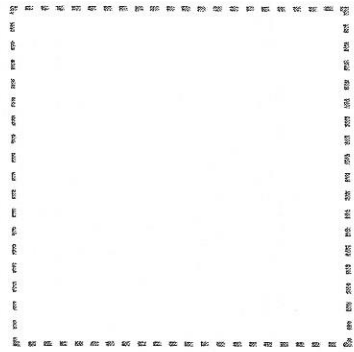
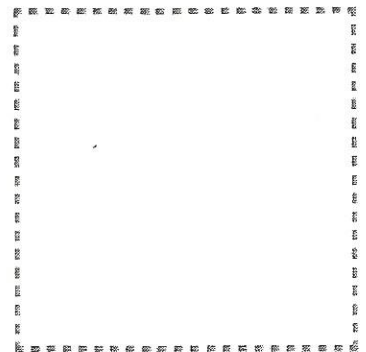
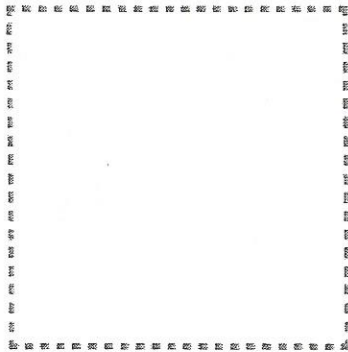
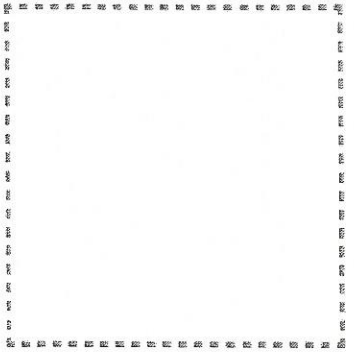
 <p>helium</p>	 <p>icicles</p>	 <p>orange juice</p>
 <p>airplane</p>	 <p>maple syrup</p>	 <p>carbon dioxide</p>
 <p>snowman</p>	 <p>gasoline</p>	 <p>air inside of a soccer ball</p>
 <p>air inside of a tire</p>	 <p>paint</p>	 <p>cheese</p>

Name: _____

solid

liquid

gas



Name: _____

What's the Matter?



Tell whether each is a solid, liquid, or gas.

1. milk - _____

2. cookie - _____

3. oxygen - _____

4. fish - _____

5. pencil - _____

6. maple syrup - _____

7. shampoo - _____

8. carbon dioxide - _____

9. ice cube - _____

10. paint - _____

11. oil - _____

12. salt - _____

13. water vapor - _____

14. gasoline - _____

15. helium - _____

16. sand - _____

Complete each sentence with the word solid, liquid, or gas.

A _____ has a definite shape. It does not take the shape of its container. It also has a definite volume because it can be measured.

A _____ does not have a definite shape. It takes the shape of its container. It does have a definite volume because it can be measured.

A _____ does not have a definite shape. It sometimes takes the shape of its container and sometimes flies freely around you. These particles are not connected to each other and takes up whatever space is available.