

Introduction

Teachers greatly influence children's interests. They expose children to new and stimulating topics and help them organise their knowledge. The Doing Science series was created to help you encourage children to be curious, to ask questions, to experiment, to learn, and to organise and integrate knowledge. This book will help you teach the processes of science – processes that can be integrated into all parts of our lives.

About This Book

Each activity page covers a topic that will easily fit into your science curriculum. The activities help students develop one or more of the following process skills:

- **Observing** – using the senses to gather information about objects and events.
- **Comparing** – identifying common and distinguishing characteristics among items or events.
- **Measuring** – comparatively or quantitatively describing the length, area, volume, mass or temperature of objects.
- **Classifying/Grouping** – organising information into logical categories.
- **Sequencing** – arranging items or events according to a characteristic.
- **Collecting data** – collecting and recording information obtained through observation.
- **Organising data** – organising data in a logical way so the results can be interpreted.
- **Drawing conclusions** – using the skills of inferring, predicting and/or interpreting.

The **Teacher's Guide** will give you ideas for using each worksheet, including the main science concept, the process emphasis, and the materials list for each activity. The Teacher's Guide pages also include Discovery Questions – questions designed to make your students think and to encourage discussion. These questions are a mixture of specific-answer and open-ended questions that can be used either before, during or after an activity. So while your students are doing science, they are also learning to think like scientists.

Under Pressure

Concept

Barometers measure the air pressure and help us predict the weather.

Process Emphasis

Measuring and collecting data

Materials

For each student:

1. Activity worksheet, page 22
2. Pencil

For each group of four students:

1. Large baby-food jar
2. Scissors
3. Balloon
4. Paper or plastic straw
5. Rubber bands
6. PVC glue
7. Cardboard
8. Ruler

Procedure

1. Explain that a barometer measures air pressure. The needle on a barometer moves as the air pressure changes. Divide the class into groups of four. Hand out the materials and lead the class through the directions on the worksheet. Have students measure the barometric pressure twice a day, at the same times each day. They should also observe the weather changes during the week.
2. At the end of the week, have students compare their barometric changes with the weather. Ask them to look for patterns, such as high readings bring clear weather and low readings precede storms.

Discovery Questions

- How could your barometer help you predict the weather?
- What is the difference between an aneroid barometer and a mercury barometer?

Under Pressure

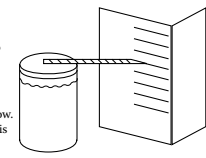
NAME: _____

The pressure of the air can be measured using a barometer. In this activity you will build your own barometer. It will give you a general idea of how air pressure relates to weather conditions.

1. Cut a large section from the balloon and stretch it tightly over the mouth of the jar. Have someone place a rubber band or two around the balloon section so it will stay in place.
2. Cut the end of the straw so that it forms a point.
3. Put a drop of glue in the centre of the balloon section. Place the non-pointed end of the straw lengthwise on the spot of glue. Hold the straw until it is set.
4. Fold the cardboard until it can stand by itself. Place it next to the pointed end of the straw and mark a line on the cardboard where the straw points. Label the mark with the number 5.
5. Make five marks counting up and five marks down from the 5. The marks should be three millimetres apart. Write the numbers from 0 to 10 at the marks.
6. Realign with the straw next to the number 5. Check your barometer twice a day for a week. Record the barometric reading in the chart below. You should also record whether the barometer is rising or falling and the weather conditions for each day.

You will need:

- large baby-food jar
- scissors
- balloon
- paper or plastic straw
- rubber bands
- PVC glue
- cardboard
- ruler
- pencil



| | A.M. | P.M. | Rising or Falling? | Weather Conditions |
|-----------|------|------|--------------------|--------------------|
| Monday | | | | |
| Tuesday | | | | |
| Wednesday | | | | |
| Thursday | | | | |
| Friday | | | | |

22 © 2010 Hawker Brownlow Education • 387

Hot Rocks!

Concept

Igneous rocks are formed from hardened magma.

Process Emphasis

Classifying

Materials

For each student:

- Activity worksheet, page 28
- Pen or pencil
- Crayons or coloured pencils (optional)

For the class:

- Samples of igneous rocks—granite, basalt, obsidian, and pumice
- Hand lenses (optional)

Hot Rocks!

NAME: _____

Some of the rocks we see come from volcanoes. These volcanoes have usually been 'dead' for millions of years. There are different kinds of volcanic rock. The differences occur because the rocks are formed differently. Read the descriptions of the rocks below. Then decide how and where each rock is formed. Write the name of the rock on the appropriate blank.

| | |
|--|---|
| Basalt: This type of rock forms when magma pours slowly out of the earth and cools slowly. Basalt has small crystals and sometimes has small holes. | Obsidian: This type of rock forms when magma pours out of the earth slowly but cools quickly. It looks like smooth, black glass. |
| Granite: This type of rock forms under the ground. The magma cools and hardens between layers of rock. Granite has large crystals and a coarse texture. | Pumice: This type of rock forms when foamy lava cools very quickly. It is full of holes, very light, and can float. |

28 © 2010 Hawker Brownlow Education • 387

Procedure

1. Show students the rock samples. Explain that these rocks were formed from magma. (You also might want to explain that lava is magma found outside the earth.) Because of this some people call them 'fire rocks'. You might want to tell students that scientists call the rocks igneous rocks, which means rocks from fire. Have students study the samples (you might want to provide hand lenses) and compare their similarities and differences. Point out that the rocks are different because they were formed differently.
2. Hand out the worksheet. Have students write the name of each rock on the proper space. You might also have them colour the different parts of the volcano.

Discovery Questions

- Gabbros is a type of rock that forms under the surface of the earth. The magma is slowly cooled and hardened. Does gabbros look more like granite or obsidian?
- Scoria is a rock that is formed by quickly cooled lava. Does scoria look more like granite or pumice?

Under Pressure

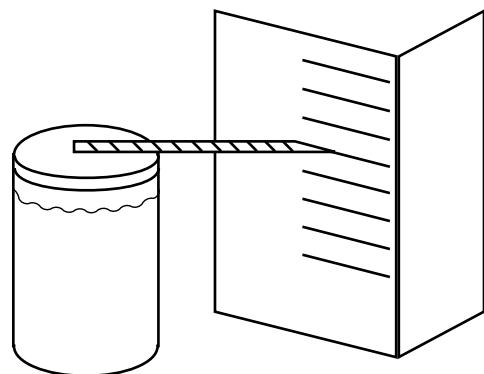
NAME: _____

The pressure of the air can be measured using a barometer. In this activity you will build your own barometer. It will give you a general idea of how air pressure relates to weather conditions.

1. Cut a large section from the balloon and stretch it tightly over the mouth of the jar. Have someone place a rubber band or two around the balloon section so it will stay in place.
2. Cut the end of the straw so that it forms a point.
3. Put a drop of glue in the centre of the balloon section. Place the non-pointed end of the straw lengthwise on the spot of glue. Hold the straw until it is set.
4. Fold the cardboard until it can stand by itself. Place it next to the pointed end of the straw and mark a line on the cardboard where the straw points. Label the mark with the number 5.
5. Make five marks counting up and five marks down from the 5. The marks should be three millimetres apart. Write the numbers from 0 to 10 at the marks.
6. Realign with the straw next to the number 5. Check your barometer twice a day for a week. Record the barometric reading in the chart below. You should also record whether the barometer is rising or falling and the weather conditions for each day.

You will need:

- large baby-food jar
- scissors
- balloon
- paper or plastic straw
- rubber bands
- PVC glue
- cardboard
- ruler
- pencil



| | A.M. | P.M. | Rising or Falling? | Weather Conditions |
|------------------|------|------|--------------------|--------------------|
| Monday | | | | |
| Tuesday | | | | |
| Wednesday | | | | |
| Thursday | | | | |
| Friday | | | | |

Hot Rocks!

NAME: _____

Some of the rocks we see come from volcanoes. These volcanoes have usually been 'dead' for millions of years. There are different kinds of volcanic rock. The differences occur because the rocks are formed differently. Read the descriptions of the rocks below. Then decide how and where each rock is formed. Write the name of the rock on the appropriate blank.

Basalt: This type of rock forms when magma pours slowly out of the earth and cools slowly. Basalt has small crystals and sometimes has small holes.

Obsidian: This type of rock forms when magma pours out of the earth slowly but cools quickly. It looks like smooth, black glass.

Granite: This type of rock forms under the ground. The magma cools and hardens between layers of rock. Granite has large crystals and a coarse texture.

Pumice: This type of rock forms when foamy lava cools very quickly. It is full of holes, very light, and can float.

