

# EXPLORING THE EARTH: A TEN DAY JOURNEY FROM THE INSIDE OUT

**Grade Level:** First Grade

**Presented by:** Mary Wilson, E.L. DeGolyer Elementary, Dallas, TX  
Stephanie Wachsman, Serna Elementary, San Antonio, TX

**Length of Unit:** Ten lessons

## I. ABSTRACT

Young scientists explore the earth from the inside out during a ten day journey. Because the core and the mantle are so hot, the scientists must stay on the crust to study rocks, minerals, and crystals. However, with the movement of plates, they also discover and experience erupting volcanoes, huge mountains, and rattling earthquakes. Through their discoveries students will gain an understanding of the causes and effects of our ever changing Earth.

## II. OVERVIEW

- A. Students will gain an understanding of the geographical features of the Earth's surface as well as what is inside the earth.
- B. The specific content from the Core Knowledge Sequence to be covered includes: the shape of the earth, oceans and continents, North and South pole, equator, the crust, mantle, and core, volcanoes, rocks, and minerals.
- C. Specific skills to be taught are summarization, comparing and contrasting, cause and effect, sequencing, and dramatization.

## III. Background Knowledge

Hirsch, Jr. E.D. *What Your First Grader Needs To Know: Fundamentals of a Good First-Grade Education*. New York: Dell Publishing, 1991. ISBN 0-385-31026-9  
Van Cleaves, Janice. *Earthquakes Mind Boggling Experiments You Can Turn into Science Fair Projects*. New York: John Wiley and Sons, Inc., 1993. ISBN 0-471-57107-5  
*The Earth Picturpedia*. New York: Dorling Kindersley, Inc., 1992. ISBN 1-56458-138-1  
*The Visual Dictionary of the Earth*. New York: Dorling Kindersley, 1993. ISBN 1-56458-335-x

## IV. RESOURCES

Cole, Joanna. *The Magic School Bus Inside the Earth*. New York: Scholastic Inc., 1987. ISBN 0-590-40759-7  
Christain, Spencer. *Shake, Rattle, and Roll: The World's Most Amazing Earthquakes, Volcanoes, and Other Forces*. New York: John Wiley and Sons, 1997.  
Parker, Steve. *Rocks and Minerals*. New York: DK Publishing, Inc., 1993. ISBN 0-7894-1682-4  
Murray, Peter. *Earthquakes*. United States: The Child's World, Inc., 1996. ISBN 105676601980-X  
Stangl, Jean. *Crystals and Crystal Gardens You Can Grow*. New York: Franklin Watts, 1990. ISBN 0-531-10889-9  
Van Cleaves, Janice. *Volcanoes: Mind-Boggling Experiments You Can Turn Into Science Fair Projects*. New York: John Wiley and Sons, Inc., 1994. ISBN 0-471-30811-0  
Zoehfeld, Kathleen Weidner. *How Mountains Are Made*. New York: Harper Collins Publishers 1995. ISBN 0-06-023510-7  
A Time Life Book. *Are Their Diamonds In My Backyard?* Virginia: Time Life Inc., 1995. ISBN 0-7855-0902-2

## V. LESSONS

**A. Lesson One: Inside the Earth****1. Objective/Goal:**

The student will identify and recognize the shape of the Earth, the core and the mantle.

**2. Materials**

- a. Precut 3" Styrofoam ball for each student (APPENDIX A)
- b. Red and yellow paint
- c. Peach
- d. Large Earth model (An ongoing project used throughout the unit) (APPENDIX A)
- e. Journal page one (APPENDIX F)
- f. CORE label and MANTLE label (APPENDIX B)

**3. Prior Knowledge for Students**

The student will have a basic understanding of the Earth's shape.

**4. Key Vocabulary**

- a. Earth - The Earth is a huge sphere covered with water, rock, and soil, and surrounded by air
- b. Core - The central portion of the Earth
- c. Mantle - The layer of the Earth which is below the crust
- d. Magma - Melted rock beneath the Earth's surface

**5. Procedure/Activities**

- a. Students brainstorm what they know about the Earth while teacher records on chart.
- b. Teacher prompts students to give their ideas on what is inside the Earth.
- c. Teacher uses large Earth display and a peach as an example of the Earth to lead a discussion about the Earth's core using the following information:  
The Earth is a huge sphere covered with water, rock, and soil and surrounded by air. The central portion of the Earth is known as the core. (Teacher adds core to large Earth display and the "CORE" label. Teacher cuts into peach and compares to the core.) There are actually two parts of the core: the inner core and the outer core. The center of the Earth is about 4,000 miles below the Earth's surface. The inner core is a solid ball of iron and nickel. The inner core is hotter than the outer core. The outer core is composed of melted iron and nickel.
- e. Teacher refers back to the peach. Compare the mantle to the peach beneath the skin.
- f. Using the large Earth display, teacher leads discussion about the mantle using the following information:  
The mantle is a thick layer of solid rock below the crust. Parts of the mantle are so hot the rock has melted into magma. The mantle goes down about 1,800 miles under the crust. (Teacher adds mantle to large Earth display and "MANTLE" label.)
- g. Given the cut Styrofoam ball, students will paint a nickel sized red circle to represent the core, and paint the mantle yellow leaving 1/8 inch border on outside edge. (APPENDIX A )
- h. Students complete page one of journal by coloring and labeling the core and the mantle.

**6. Evaluation/Assessment**

Evaluation will consist of participation, following directions, and completion of model and journal.

**B. Lesson Two: The Crust****1. Objective/Goal**

The student will identify, recognize, and locate the Earth's crust.

**2. Materials**

- a. Apple.
- b. 3" Styrofoam ball from previous lesson
- c. Brown paint
- d. Large Earth model
- e. Journal page two (APPENDIX F)
- f. Red, yellow, and blue play-dough
- g. Clear straws
- h. CRUST label (APPENDIX B)

**3. Prior Knowledge for Students**

The students will have a basic understanding of the Earth's core and mantle.

**4. Key Vocabulary**

- a. Core - The central portion of the Earth
- b. Mantle - The layer of the Earth which is below the crust
- c. Crust - The outer layer of the Earth lying above the mantle

**5. Procedure/Activities**

- a. Teacher uses an apple as an example of the Earth. The skin of the apple represents the crust of the Earth. Teacher peels skin and uses the following information to discuss the Earth's crust:  

The outer layer of the Earth lying above the mantle is the crust. The crust is made of rock that has been built up as rock for millions of years. The crust can be anywhere from 3 1/2 miles to 42 miles thick. The Earth's crust consists of the oceanic crust and the continental crust. The continental crust makes up the continents. It is thick, and its composition is similar to granite. The oceanic crust forms the ocean floors and also runs underneath the continental crust. It is thin, and its composition is similar to basalt. The deepest hole ever drilled into the crust is about 8 miles deep.
- b. Teacher adds crust and label to the large Earth display.
- c. Students work in cooperative groups to create the following model of the Earth depicting the three layers.
  1. One student forms a ball about 1/2 inch in diameter with the red play-dough to represent the core.
  2. One student covers the red ball with a thick layer of yellow play-dough to represent the mantle.
  3. One student covers the yellow play-dough with a thin layer of blue play-dough to represent the crust.
  4. Each student takes one clear straw and pokes it through the center of the model to see the layers represented.
- d. Students paint a brown crust on Styrofoam model about 1/8" thick.
- e. Students complete page two of journal by coloring and labeling the crust.
- f. Student's homework assignment will be to bring one rock for tomorrow's lesson.

**6. Evaluation/Assessment**

Evaluation will consist of following directions, group participation and completion of group project and journal.

**C. Lesson Three: Rocks****1. Objective/Goal**

- a. The student will identify characteristics of sedimentary, metamorphic, and igneous rocks.
- b. The students will create a sedimentary and igneous rock model.

**2. Materials**

- a. *The Magic School Bus Inside the Earth* by Cole

- b. Sedimentary Rock Model
- c. Sedimentary rock model directions (APPENDIX E)
- d. "Rocks" for display: chalk, blackboard, tile, marble, granite
- e. Journal page three (APPENDIX B)
- f. Aerosol insulating foam (available at Home Depot)
- g. Wax paper

### 3. Prior Knowledge

The students will be able to identify a rock.

### 4. Key vocabulary

- a. Sedimentary - A rock formed from small pieces of rock that settle in deep layers
- b. Metamorphic - An igneous or sedimentary rock changed by underground heat, weight, or both.
- c. Igneous - Rocks made from cooled magma or lava
- d. Pumice - A volcanic rock
- e. Fossils - Remains of prehistoric plants or animals that were trapped in rocks and turned to stone

### 5. Procedures/Activities

- a. Students place rocks in middle of circle and discuss similarities and differences while teacher records.
- b. Students group rocks and explain the groups and characteristics.
- c. Repeat 'b' for different results.
- d. Teacher displays "rocks" and questions students about similarities and differences of their rocks.
- e. Teacher leads discussion about "rocks" and Earth's rocks using the following information:

Rocks cover the Earth and continually change. Rocks can be worn down by wind and water, melted by extreme heat, and compressed to form new rocks. As rocks are broken down into smaller pieces, they can be carried by rivers into the sea. Over many years, the rocks pile up in layers and press together to make solid rock. These rocks are known as sedimentary rocks. Some sedimentary rocks contain remains of shells or sea creatures known as fossils.

Fossils are the remains of prehistoric plants or animals that were trapped in rocks and turned to stone. An example of a sedimentary rock is limestone and chalk is a type of soft white limestone. Igneous rocks are made from a cooled magma or lava. Magma is molten (liquid) rock found deep underground.

Magma ejected above the Earth's surface (like a volcano) is known as lava. Igneous comes from a word meaning "fire" and they're also known as fiery rocks. A pumice is an example of an igneous rock. It is a volcanic rock that is hardened lava froth and contains many tiny air bubbles. It is able to float on water due to the air trapped inside. The igneous rock, granite, is known as an intrusive igneous rock because it turned solid underground. Granite is used in monuments and buildings.

Metamorphic rocks are igneous or sedimentary rocks that have been altered by intense heat or extreme weight. All rocks can become metamorphic if exposed to the right conditions. An example of metamorphic rock is slate made when shale rock inside mountains is squeezed incredibly hard. Slate is used for making blackboards and floor tile.

- f. Teacher reads 7-19 of *Magic School Bus Inside the Earth* by Cole
- g. Prior to lesson, teacher prepares 4 sedimentary rock models for later discussion.
- h. Class makes a sedimentary rock model. (APPENDIX E)

- i. Break open the layers from the prepared models to see the “fossils” and imprints in the sedimentary rocks and discuss.
- j. Teacher reads pages 20-29 from *The Magic School Bus Inside the Earth* by Cole
- k. Prior to lesson, the teacher prepares a pumice rock for each child by following the directions on an aerosol insulating foam can making golf ball size “rocks” on wax paper.
- l. Teacher gives each student a “pumice rock” (an example of an igneous rock)
- m. In cooperative groups, students compare the sedimentary rocks (the ones prepared prior to lesson) and the igneous rocks (the pumice rocks).
- n. Cooperative groups share observations with the class.
- o. Students complete page three of journal by coloring and labeling.

#### **6. Evaluation/Assessment**

Evaluation will consist of following directions, group participation, class discussion, and completion of rock model, and journal.

### **D. Lesson Four: Minerals**

#### **1. Objective/Goal**

- a. The student will identify minerals used in everyday life.
- b. The student will create various crystals.

#### **2. Materials**

- a. Diamond
- b. Powder
- c. Pencil (graphite)
- d. Gold
- e. Salt
- f. Basic Solution
  1. 3 tablespoons water
  2. 3 tablespoons bluing (found in with laundry products)
  3. 3 tablespoons salt
  4. Mix slowly and add 1 tablespoon ammonia
- g. Experiment: Crystals on a Pillar
  1. 6 inches of yarn, string, and rope
  2. 2 tablespoons rock salt
  3. 1 cup hot tap water
  4. Clear plastic cups
  5. Spoon
- h. Crystals on a pillar directions (APPENDIX E)
- i. Experiment: Porous Rock Garden
  1. Lava rocks (found in barbecue sections of stores)
  2. Pumice stones (found in cosmetics sections of stores)
  3. Clear plastic container with lid
  4. water
  5. 1 tablespoon salt
- j. Porous rock garden directions (APPENDIX E)
- k. Experiment: A Garden of Odds and Ends
  1. marble
  2. nail
  3. wooden spoon
  4. tree bark
  5. rubberband
  6. piece of plastic
  7. styrofoam cup

8. basic solution
9. plastic container
- l. A garden of odds and ends directions (APPENDIX E)
- m. Journal page four

### 3. Prior Knowledge

The student will have a basic understanding of the three types of rocks.

### 4. Key Vocabulary

- a. Mineral – The building blocks of rocks
- b. Crystal – Smaller units of some minerals

### 5. Procedures/Activities

- a. The teacher displays diamond, powder, salt, pencil (graphite), and gold and leads a discussion using the following information:  
Minerals are the building blocks of rocks. Some rocks are composed of one mineral while others contain different minerals, like granite. Minerals can be classified as hard or soft. The hardest is the diamond and the softest is talc. People use minerals and adapt them to make products such as graphite for pencil leads, and talc for crayons and talcum powder. Some minerals are made of smaller units called crystals. Crystals form when heat inside the Earth melts the minerals in rocks. The minerals cool and harden into structures called crystals. Small crystals are formed when the minerals cool quickly. Large crystals are formed when the minerals cool slowly, over thousands of years.
- b. Prior to lesson, teacher places lava rocks and pumice rocks in a clear plastic container. Cover with water and soak overnight
- c. Class completes porous rock garden (APPENDIX E)
- d. Class participates in making A Garden of Odds and Ends (APPENDIX E)
- e. Prior to this lesson, the teacher ties a piece of string, yarn, and rope onto separate pencils.
- f. As a class, complete Crystals on a Pillar (APPENDIX E)
- g. Students predict results and discuss.
- h. Students check for results in 24 hours.
- i. Students complete page four of journal by illustrating the three crystal experiments.

### 6. Evaluation/Assessment

Evaluation will consist of following directions, participation, and completion of group project and journal.

## E. Lesson Five: The Earth's Surface

### 1. Objective/Goal

The student will identify the north and south pole, the equator, oceans, continents, and horizon.

The student will locate and label the north and south pole, the equator, oceans, continents, and horizon.

### 2. Materials

- a. Labels for large class display (APPENDIX B)
- b. Labels for group projects – one set per group (APPENDIX B)
- c. Large Earth display
- d. Paint: blue, green, red, and purple
- e. Large Earth model for group project – one per group (APPENDIX A)
- f. Journal page five (APPENDIX F)

### 3. Prior Knowledge

The students will have a basic understanding of the Earth's shape, land, and water.

#### 4. Key Vocabulary

- a. North Pole – The top part of the Earth
- b. South Pole – The bottom part of the Earth
- c. Equator – An imaginary circle between the north and south pole
- d. Continent – A large land mass
- e. Ocean – A large body of water

#### 5. Procedures/Activities

- a. The teacher introduces the new vocabulary and labels the large Earth accordingly while discussing the following information:  
The earth consists of land and water. Large bodies of water called oceans cover over 70% of the earth. The rest of the planet is composed of the seven large land masses called continents. The north pole is located at the top of the earth and the south pole is located at the bottom. Both poles are covered with ice and snow because the light and heat from the sun is weak at the poles. An imaginary line runs around the center of the earth between the poles called the equator. The sun shines strongly at the equator, therefore, the oceans there never get cold enough to freeze.
- b. In cooperative groups, students paint an earth model using the following information:
  1. Paint the continents green.
  2. Paint the oceans blue.
  3. Paint the equator red.
  4. Paint the poles purple.
- c. Students label their earth model with labels after the paint dries.
- d. Students complete journal page five by coloring.

#### 6. Evaluation/Assessment

Evaluation will consist of group participation and completion of group project.

### F. Lesson Six: The Earth's Plates

#### 1. Objective/Goal

The student will be able to identify and explain the four different types of plate movement and relate it to plate tectonics.

The student will role play the four movements.

The student will create a model of one of the four types of plate movement.

#### 2. Materials

- a. Store bought world map with plate divisions marked (APPENDIX C)
- b. Two plate pieces per group (enlarged for activity) (APPENDIX C)
- c. Crayons or markers
- d. Posterboard
- e. Examples of plate movements (APPENDIX C)
- f. Journal page six (APPENDIX F)

#### 3. Prior Knowledge

The student will have a basic understanding of the continents and oceans.

#### 4. Key Vocabulary

- a. Plate – Any of the huge moveable segments into which the earth is divided
- b. Plate tectonics – The movement of plates
- c. Pangea – The super continent (all of the continents together) that was formed about 200 million years ago

**5. Procedures/Activities**

- c. Teacher uses a store bought map of plates and new vocabulary while discussing the following information:

The earth's crust is made up of many pieces called plates. There are seven major plates named after the continents or oceans that sit on them. There are also a few smaller plates. Some plates include just land masses while others include land and water. (APPENDIX C) These plates ride on soft, partly melted rock moving underneath them. The movement of the plates is called plate tectonics. About 200 million years ago, the continents were joined together in one continent called Pangea. Over millions of years, the plates continued to move, splitting the continents apart from each other. The plates push against each other creating earthquakes, volcanoes, and mountains. The plates are always moving. In one year the plates usually move about one inch. There are four basic ways that plates can move and affect other plates. (APPENDIX C)

1. Sometimes two plates can push against each other and crumple the land, making mountain ranges.
  2. Sometimes one plate can slide underneath another pushing it down into the mantle and melting.
  3. Sometimes two plates can split apart and lava bubbles up to fill the gap and then hardens to form new land.
  4. Sometimes two plates slip sideways past each other causing an earthquake.
- d. In partners, students will act as though they are two plates and will act out the four plate movements.
- e. In cooperative groups, students will receive and color two enlarged plates.
- f. Students will glue their plates onto a piece of posterboard and label depicting one of the plate movements. (Teacher will assign each group a particular movement.)
- g. Groups explain and share their poster.
- h. Students complete page six of journal by coloring the plates.

**6. Evaluation/Assessment**

Evaluation will consist of following directions, participation, and completion of group project and journal.

**G. Lesson Seven: Mountains****1. Objective/Goal**

The student will identify how mountains are formed.

**2. Materials**

- a. Volcano book by Nirgiotis
- b. World map from lesson six
- c. Mountains of the world labels (APPENDIX B)
- d. Mountain label for large earth model (APPENDIX B)
- e. Journal page eight (APPENDIX F)
- f. Highest mountain table (APPENDIX B)

**3. Prior Knowledge**

Students will have a basic understanding of plate tectonics.

**4. Key Vocabulary**

Mountain – A land mass that projects above its surroundings and is



higher than a hill

### 5. Procedures/Activities

- a. Teacher introduces new vocabulary and adds a mountain picture and label to the large earth display while discussing the following information:  
There are three main types of mountains: fold mountains (the Andes in South America), volcanic mountains (Mt. Kilimanjaro in Africa), and block mountains (Sierra Nevada in North America). Fold mountains are formed when two plates push against each other, causing rocks to buckle into folds. Volcanic mountains build up when magma wells up into the earth's surface and block mountains form from pressure beneath the surface, cracking the crust into blocks which move up and down. A mountain takes millions of years to form. Mountains are usually found in chains that may extend for thousands of miles. The highest mountain in the world is Mt. Everest. The highest mountain on each continent can be found on appendix B. Teacher will discuss these mountains and label on the world map from lesson five and six.
- d. Students work in cooperative groups to create a mountain range out of modeling clay. The groups will form the mountain range on an 8x11 piece of cardboard.
- e. Students share and describe their mountain ranges with the class.
- f. Students complete journal page eight by illustrating and labeling a mountain.

### 6. Evaluation/Assessment

The evaluation will consist of following directions, participation, completion of group project and journal page.

## H. Lesson Eight: Volcanoes

### 1. Objective/Goal

The student will identify causes and effects of volcanoes.  
The student will participate in a volcanic demonstration.  
The student will make a volcano model.

### 2. Materials

- a. Volcano label for large earth model (APPENDIX B)
- b. Model Volcano Experiment:
  1. Funnel
  2. Baking Soda
  3. 16 ounce plastic bottle
  4. Small plastic bottle or cup
  5. Vinegar
  6. Red food coloring
  7. Cake pan
  8. Soil and sand
- c. Volcano pattern (APPENDIX D)
- d. Red, yellow, orange tissue paper
- e. Black construction paper (1 piece per child)
- f. Journal page seven (APPENDIX F)

### 3. Prior Knowledge

The student will have a basic understanding of plates and plate tectonics.

### 4. Key Vocabulary

- a. Volcanologist – A scientist who studies volcanoes
- b. Volcano – A hole in the crust of the earth from which hot rock and steam erupt

- c. Lava – Hot, melted rock that erupts from a volcano and flows onto the earth’s surface
- d. Magma – Hot, melted rock from the mantle

### 5. Procedures/Activities

- a. Teacher introduces the new vocabulary and adds a volcano picture and label to the large earth display while discussing the following information:

A volcano is the place where hot, liquid rock breaks through the earth’s crust. As the plates on the earth’s crust are moving, so is the magma, or melted rock inside the mantle. The magma rises up a main pipe and any branch pipes. Sometimes the magma finds a crack between the plates. When the magma reaches the top, it spills out of the hole called the crater. Now the magma is called lava. There are two kinds of lava. One flows quickly from the volcano and as it cools, it turns into smooth rock. The other kind flows much more slowly. Sometimes it sprays out of the crater and hardens into sharp rocks and ash while in the air. The ash forms black clouds that can block out the sun and make it dark even during the middle of the day. Volcanoes often occur at the edges of the earth’s crustal plates although, sometimes, volcanoes are formed when hot spots inside the mantle rise to the base of a plate. This is how the Hawaiian Islands were formed. A volcano that can erupt at any moment is called an active volcano. If a volcano has been quiet for many years but may erupt in the future, it is known as “sleeping” or dormant. An extinct volcano is one that is unlikely to erupt again like Mount Kilimanjaro in Africa.
- b. Class creates a model volcano. (APPENDIX E)
- c. Teacher explains the reaction with the following information:

Carbon dioxide gas was formed by the reaction of the vinegar and baking soda. The gas expands out of the bottle like the gasses in magma do in a volcano.
- d. Students cut volcano model (APPENDIX ) from black paper.
- e. Students form a mountain by gluing the ends of the pattern together.
- f. Students cut and glue red, orange, and yellow tissue paper to the top of the mountain to represent an erupting volcano.
- g. Students will complete journal page seven by illustrating and coloring an erupting volcano.

### 6. Evaluation/Assessment

Evaluation will consist of following directions, participation, and Completion of art project and journal page.

## I. Lesson Nine: Earthquakes

### 1. Objective/Goal

The student will identify causes and effects of earthquakes.  
The student will illustrate the Mercalli Scale.

### 2. Materials

- a. A box for an earthquake demonstration
- b. Small objects to recreate a city or house in the box
- c. Paper for illustration of the Mercalli Scale
- d. Ring of Fire map (APPENDIX A)

### 3. Prior Knowledge

The student will have a basic understanding of plates and plate tectonics.

### 4. Key Vocabulary

- a. Earthquake – A trembling or shaking of the ground caused by a sudden

release of energy stored in rocks beneath the earth's surface

- b. Fault – A crack in the earth's crust where blocks of rock slip past each other
- c. Seismologist – Scientist who study earthquakes

#### **5. Procedures/Activities**

- a. Teacher introduces the new vocabulary words and adds an earthquake picture and label to the large earth display while discussing the following information:

An earthquake is a trembling or shaking of the ground caused by a sudden release of energy stored in rocks beneath the earth's surface. Earthquakes result from movements along faults in the earth's crust. Faults can show up and down movements or they can move sideways past one another. When they move sideways, they are known as a strike-slip fault. An example of this is the San Andreas fault in California. Earthquakes regularly happen here and do much damage. Because San Francisco has layers of mud beneath it, earthquake waves grow in size as if travels through this soil. Earthquakes occur where the crust is weak and where there is a build up of pressure underground caused by the movements of plates. As this pressure is suddenly released, the rocks crack and send out vibrations that make the ground shake. There are about 500,000 earthquakes each year. Ninety percent of all earthquakes occur around the border of the Pacific Plate. This area is called the Ring of Fire. A seismologist is a scientist who studies volcanoes. The Richter scale measures the amount of energy released by the quake while the Mercalli scale measures how much damage and what kind of damage the quake caused. There are twelve intensities on the Mercalli Scale with 1 being the least intense and 12 being the most. The Mercalli scale:

1. Nothing is felt.
2. Lamps and plant holders swing.
3. Parked cars rock slightly.
4. Dishes rattle and doors creak and shake.
5. Some windows and dishes are broken.
6. People run outdoors. Chairs, beds, and tables move.
7. Some chimneys are broken.
8. Some walls collapse. Statues and monuments fall over.
9. The ground cracks.
10. Rail lines are bent. Landslides occur on slopes.
11. Bridges are destroyed. Few brick structures are left standing.
12. Ground breaks in waves. Objects are thrown through the air.

- b. Class creates a city or house inside a box using small objects.
- c. Shake box and open to see effects of an "earthquake."
- c. Students illustrate the Mercalli Scale. Students record the 12 intensities of the Mercalli Scale onto a large piece of paper and then illustrates each intensity.
- e. Students complete journal page nine by coloring.

#### **6. Evaluation/Assessment**

Evaluation will consist of completed illustrations of the Mercalli scale and journal page.

### **VI. CULMINATING ACTIVITY – GALLERY TOUR**

In cooperative groups students will present information learned and projects created on one of the following topics:

1. Core, Mantle and Crust
2. Rocks and Crystals
3. Plate Tectonics
4. Mountains
5. Volcanoes
6. Earthquakes

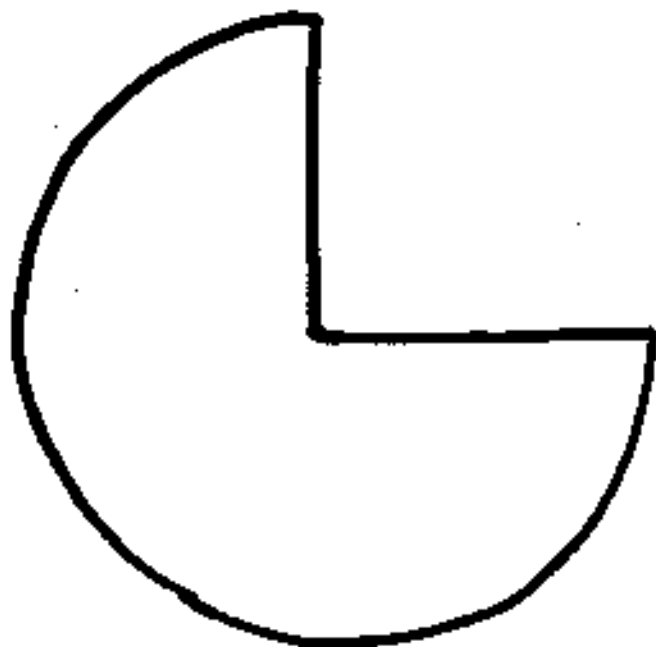
Invite other classes to tour the classroom and learn about the Earth from the first grade students.

# Models

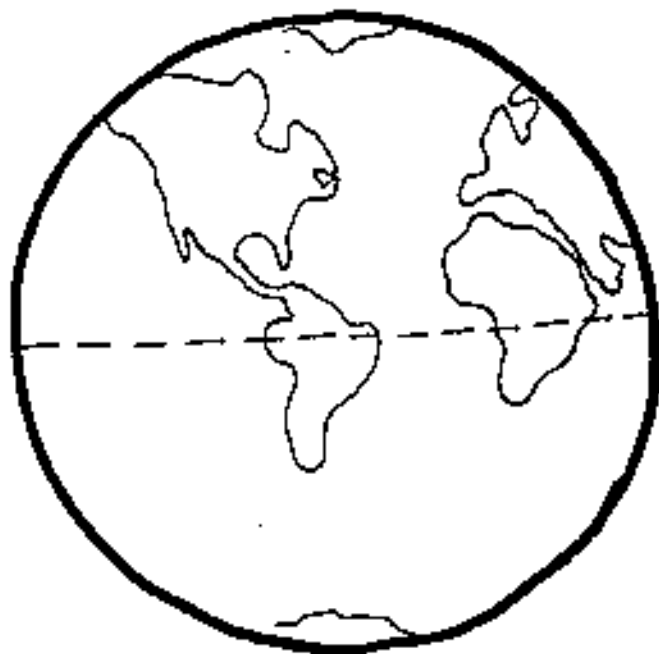
A. Large Earth Model  
displayed throughout the unit.



B. Lesson 1 and 2:  
Styrofoam ball



C. Lesson 5:  
Earth Model



D. Ring of Fire model  
Model taken from Shake, Rattle, and Roll



# Labels

Lesson 1 and 2

CORE  
MANTLE  
CRUST

Mountains of the World

<u>Mountain</u>	<u>Continent</u>	<u>Height</u>
Mt. Everest	Asia	29,028 ft
Mt. Aconcagua	South America	23,034 ft
Mt. McKinley	North America	20,320 ft
Kilimanjaro	Africa	19,340 ft
Mt. Elbrus	Europe	18,510 ft
Mt. Kosciusko	Australia	7,310

Lesson 5

North Pole  
South Pole  
Oceans  
Equator  
Continents

Lesson 7

Mountain

Lesson 8

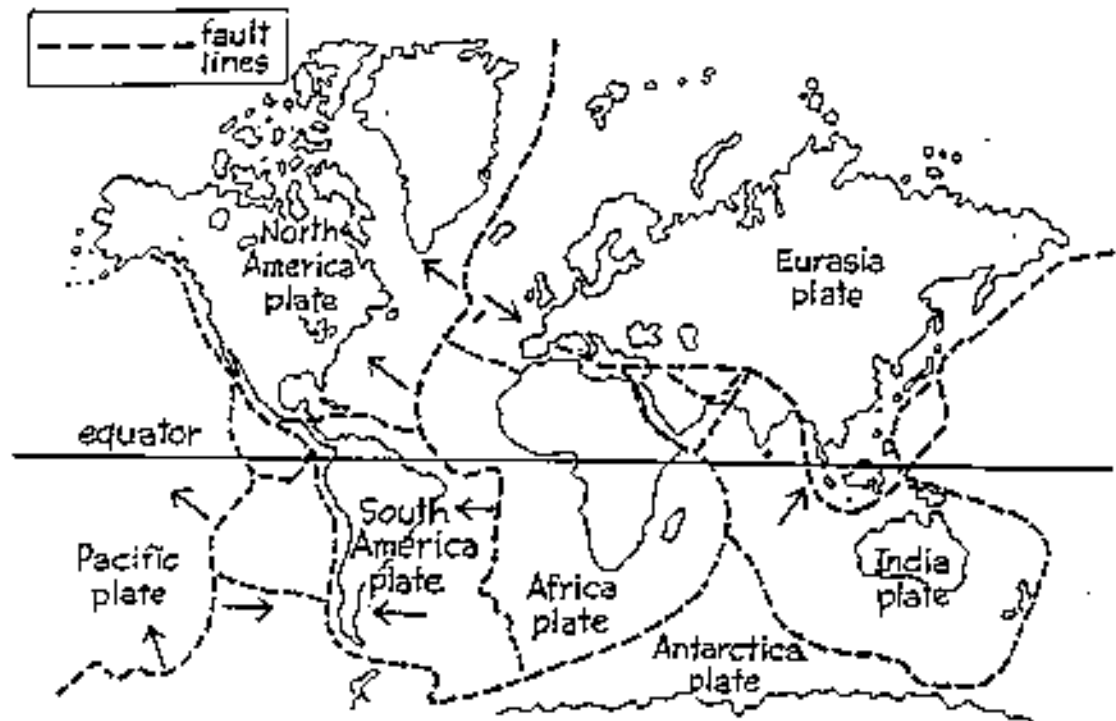
Volcano

Lesson 9

Earthquake

## APPENDIX C

# World Map with Plate Divisions



Map taken from Earthquakes

## Plate Movements

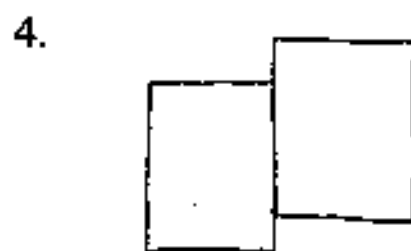
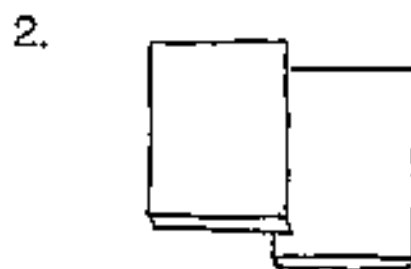
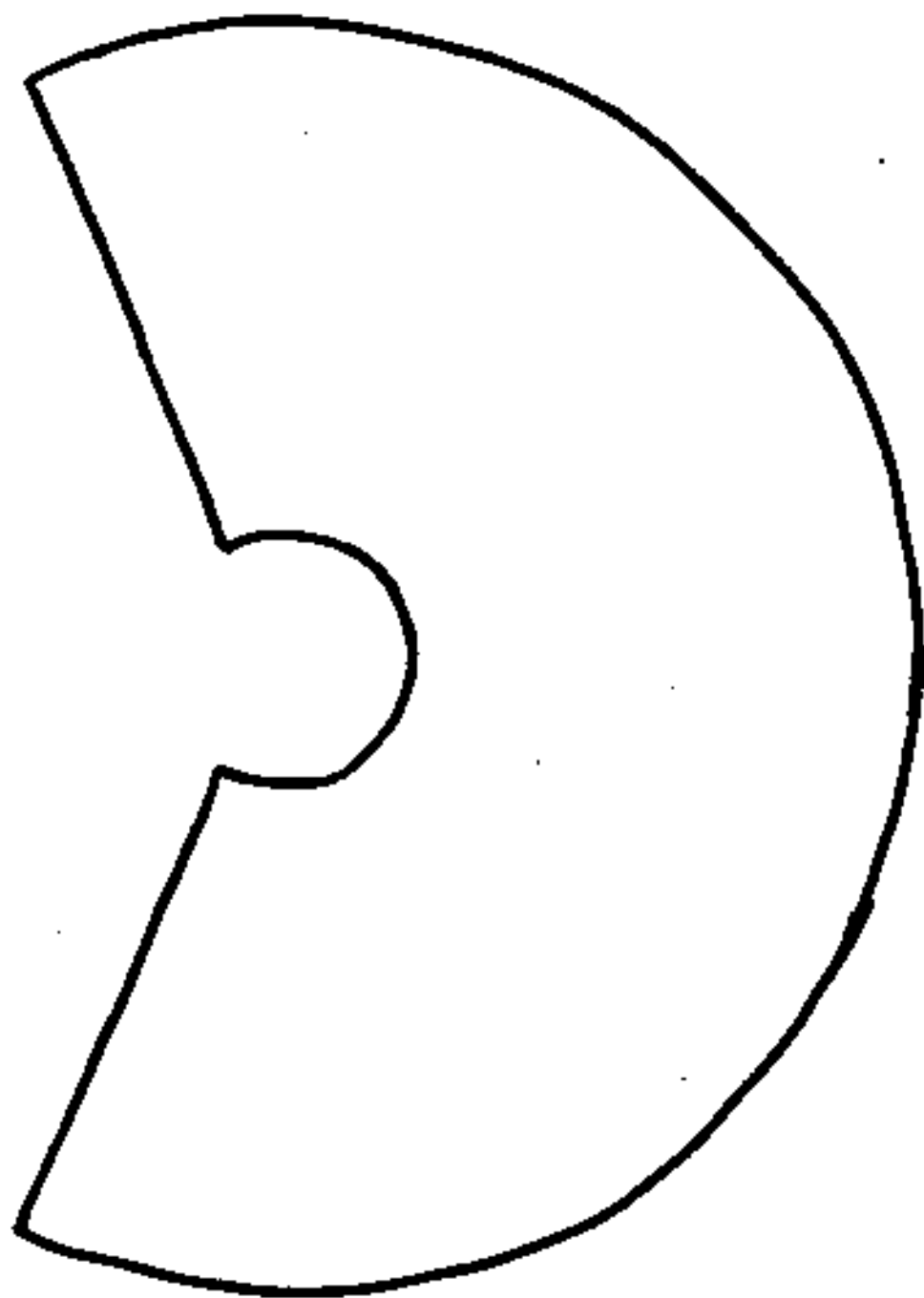


Plate movements taken from The Earth Picturepedia

APPENDIX D

# Volcano Pattern





# Procedures

## Lesson 3: Sedimentary Rock Models

Experiment taken from Rocks and Minerals

1. Put 1/3 cup sand and 1/3 cup plaster of paris into mixing bowl. Add ten drops of red food coloring.
2. Add approximately 1/4 cup water to make a paste and pour into bottle.
3. Cover shell/small pebble with petroleum jelly and put on top of paste to create "fossil".
4. Repeat steps 1-3 using blue food coloring and again with green food coloring. (To create three layers.)
5. Leave to harden for a few days and then cut away from plastic bottle.

## Lesson 4: Porous Rock Garden

Experiment taken from Crystals

\*\*\*Refer to procedure step b. for prior to lesson preparation.

1. Student pours off water.
2. Student sprinkles tablespoon of salt over rocks.
3. Student slowly pours on basic solution.

## Lesson 4: A Garden of Odds and Ends

Experiment taken from Crystals

1. Students take turns putting a marble, nail, wooden spool, tree bark, rubber band, and a piece of plastic into a styrofoam cup.
2. Stir until dissolved.
3. Student slowly spoons basic solution over materials.

## Lesson 4: Crystals on a Pillar

Experiment taken from Crystals

\*\*\*Refer to procedure step b. for prior to lesson preparation.

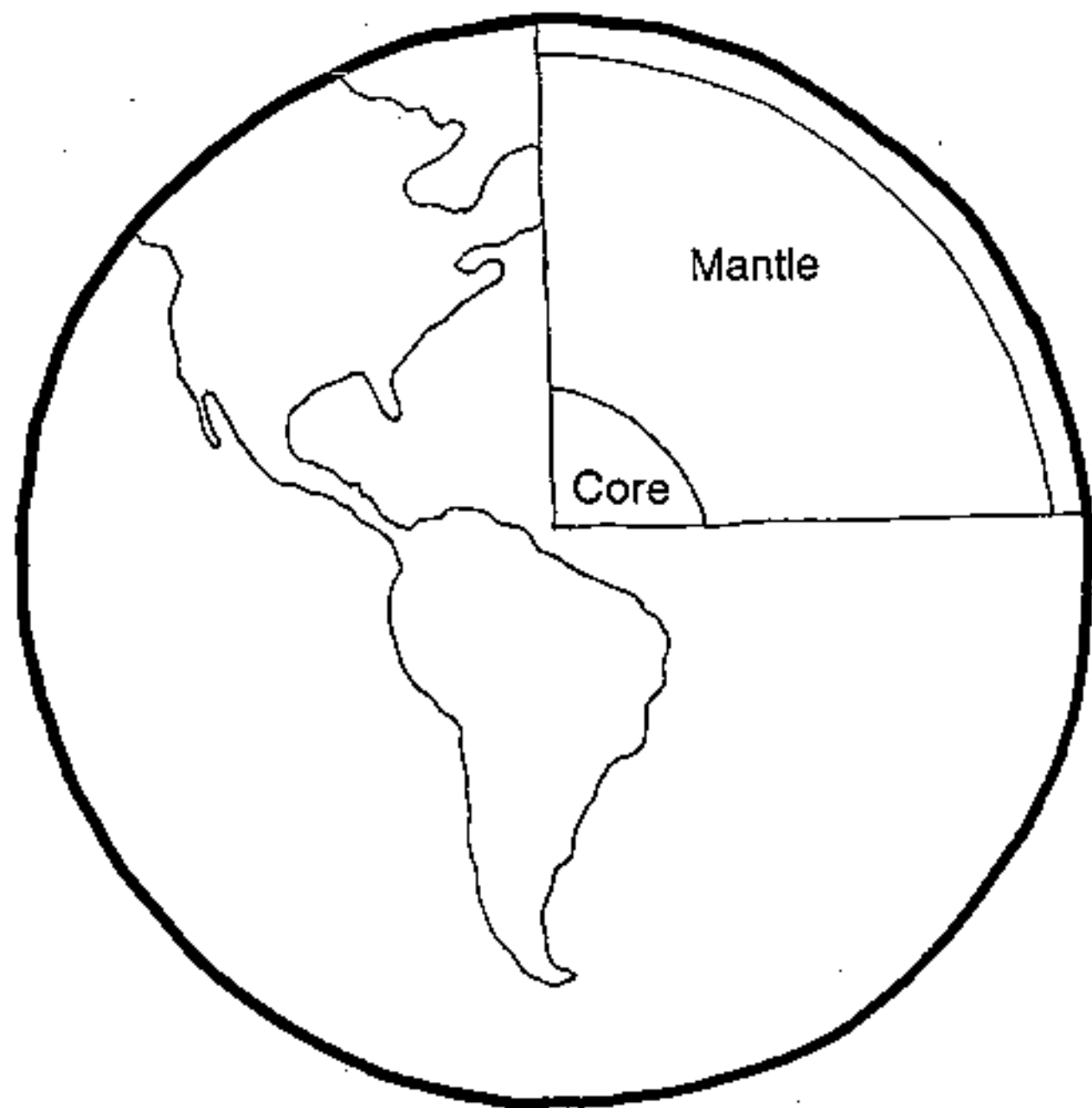
1. Add 2 tablespoons of rock salt to 1 cup hot tap water in a clear plastic cup.
2. Stir until dissolved.
3. Place pencil with yarn, string, and rope across the top of the cup so that the yarn, string, and rope are in the water.
4. Place cups in the sun.

## Lesson 8: Model Volcano

Experiment taken from Shake, Rattle, and Roll

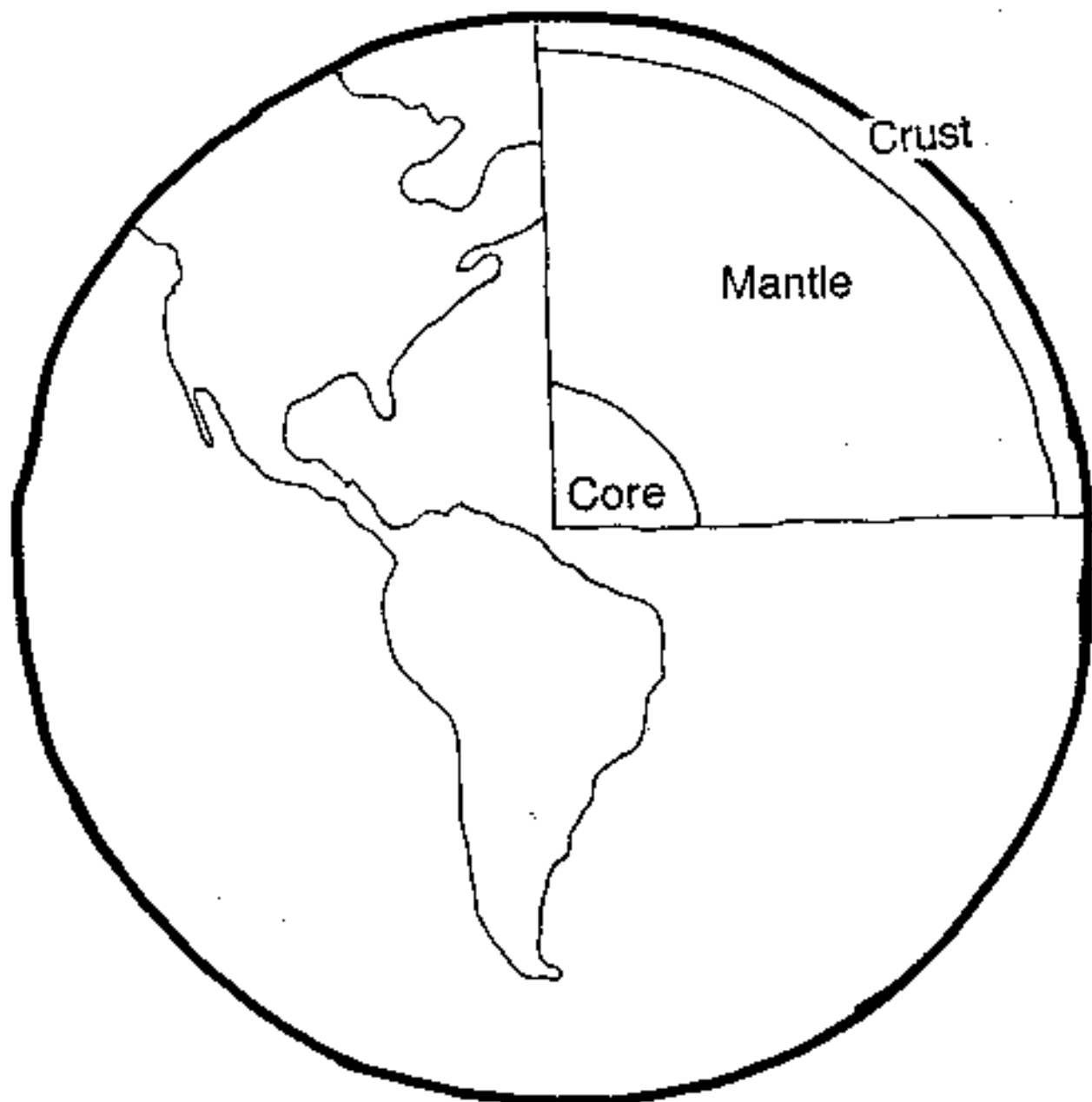
1. Place the soda bottle in the middle of a cake pan and create mountain with soil and sand around the bottle. (Mouth of bottle should be showing with funnel.)
2. Using the funnel, pour baking soda into 16 oz. bottle until half full.
3. Fill the small bottle 1/2 full of vinegar and add 6 drops of food coloring to the vinegar.
4. Quickly pour red vinegar into bottle through the funnel and then remove the funnel.

## The Core and the Mantle



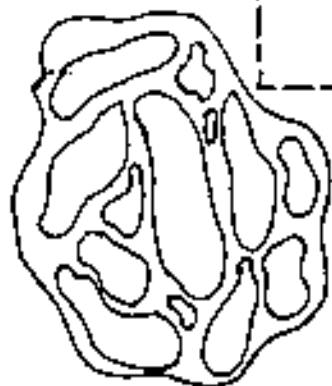
The core is the central portion of the Earth.  
The mantle is the layer of Earth below the crust.

## The Crust



The crust is the outer layer of the Earth lying above the mantle.

# Rocks



[ ]

A rock formed from small pieces of rock that settle in deep layers.

[ ]



[ ]



An igneous or sedimentary rock changed by underground heat, weight, or both.

Rocks made from cooled magma or lava.

Sedimentary  
Rock

Metamorphic  
Rock

Igneous  
Rock

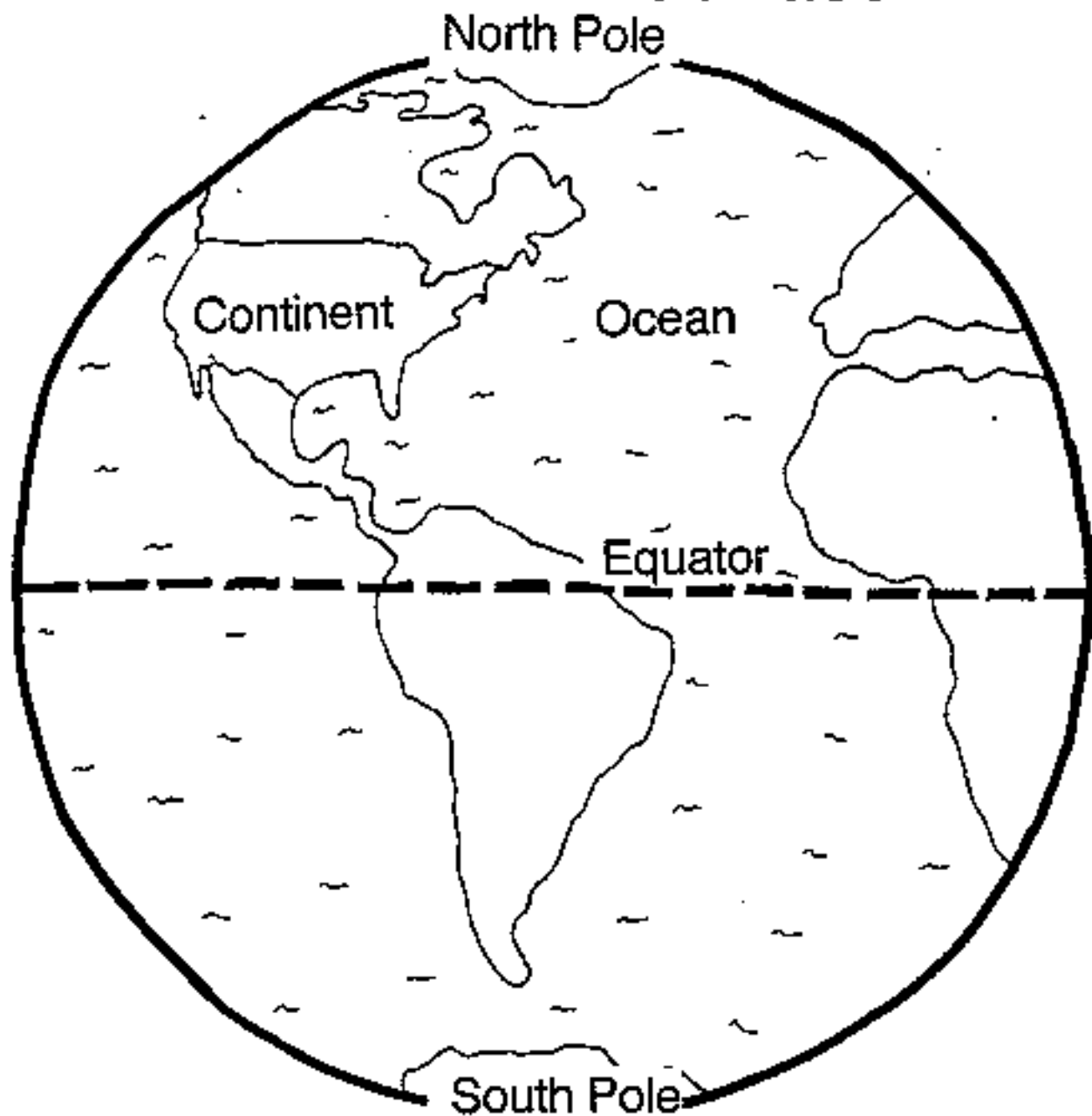
APPENDIX F

Porous Rock  
Garden

A Garden of  
Odds and Ends

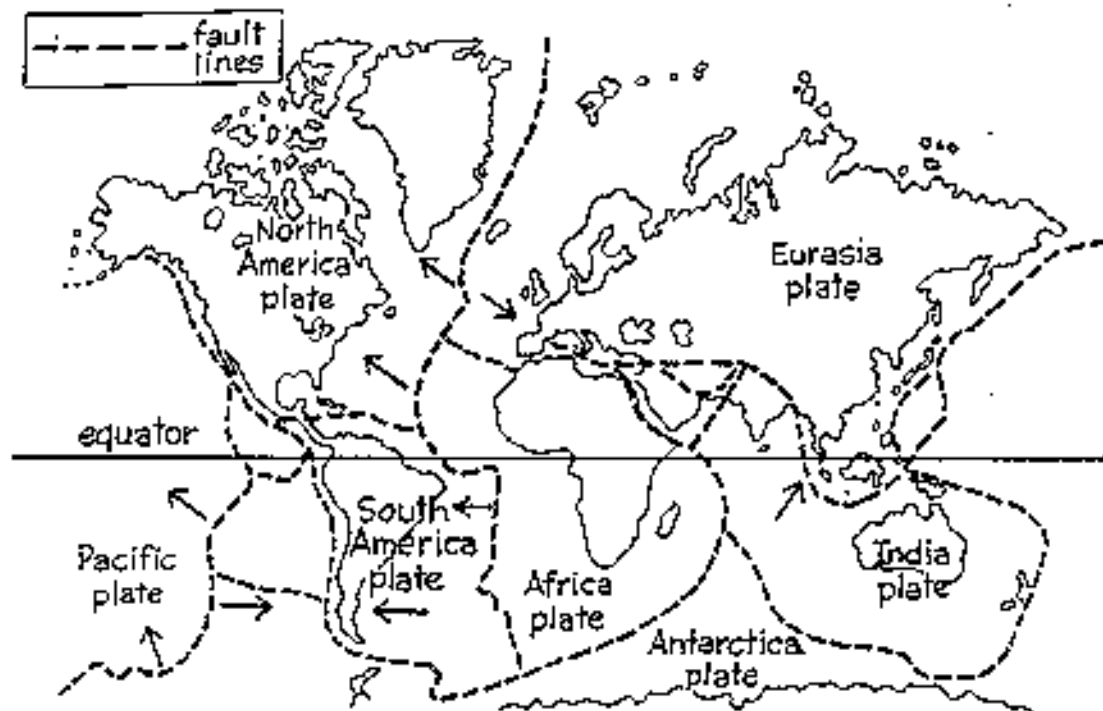
Crystals on  
Pillar

# The Earth's Surface



I can identify the North Pole, South Pole,  
Equator, Continents, and Oceans.

# The Earth's Plates



Map taken from Earthquakes

The Earth is divided into 7 major plates.  
Plates are huge movable segments  
into which the Earth's crust is divided.

# Mountains

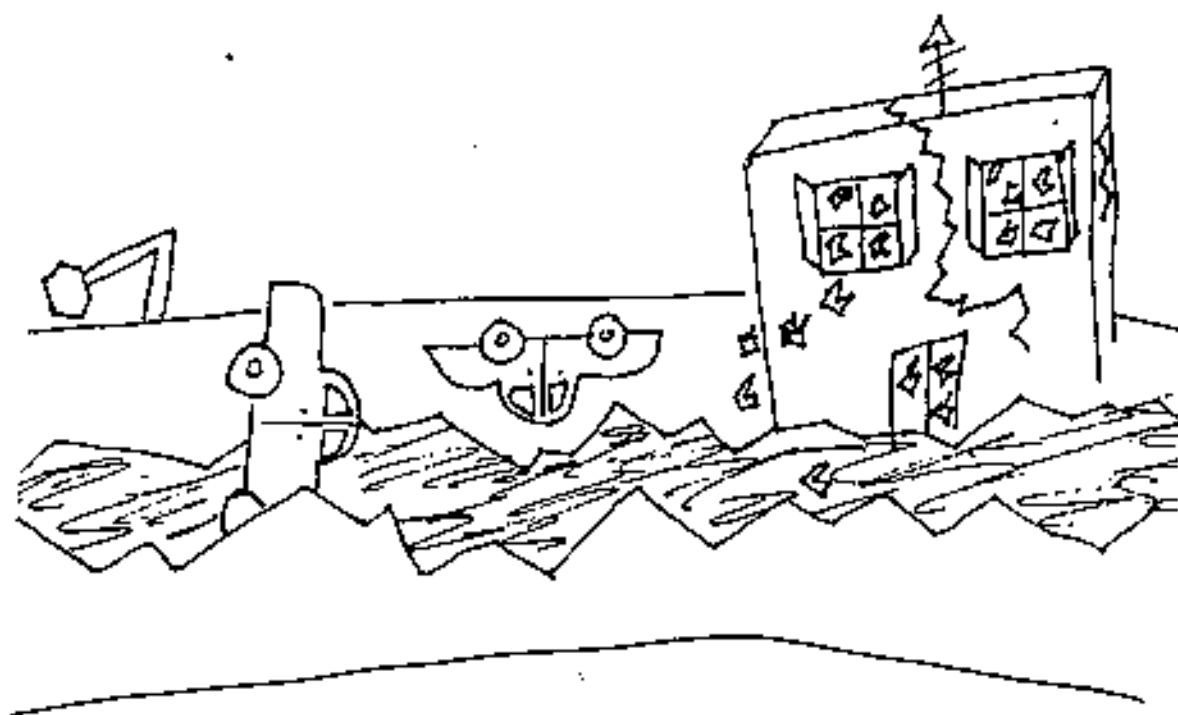
Mountains are land masses that project above its surroundings and is higher than a hill.



# Volcano

A volcano is a hole in the crust of the Earth from which hot rock and steam erupt.

# Earthquake



An earthquake is a  
trembling of the ground caused  
from movements along faults.