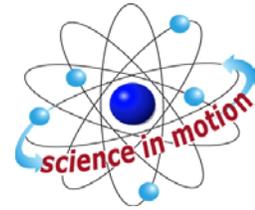


ROCKS, FOSSILS AND SOILS

SECTION 8: FOSSILS

From *Hands on Science* by Linda Poore, 2003



Westminster College

STANDARDS:

Students will write or draw descriptions of a sequence of steps, events and observations, and include the use of magnifiers or microscopes to extend senses.



Students know fossils provide evidence about the plants and animals that lived long ago and scientists learn about the past history of Earth by studying fossils.

Students will compare and sort common objects based on two or more physical attributes (including color, shape, texture, size and weight.)

KEY WORDS:

FOSSILS: Show us which organisms lived long ago. Most fossils are found in sedimentary rock. Organisms die and sediments, like mud, cover them. The organisms decays and is dissolved by ground water that seeps into the rock. An impression is left. This is imprint fossils. Minerals carried by ground water often flow into the imprint at a later time, creating a cast fossil, which is a replica of the organism.

NOTE:

EVOLUTION IS THE CHANGE IN SPECIES OVER TIME

The simplest organisms lived long ago and adapted to their environment, changing to become more successful. The earliest animals and plants lived in water. Animals eventually developed lungs and plants developed roots so they could live on land. The dinosaurs adapted to land, but died off during an ice age, possibly because they were cold-blooded and cold not adapt. Using a process called carbon dating, scientists can tell how old a rock is and thus determine when the organisms trapped as fossils in the rock lived. Similar land mammal fossils are found on continents separated by huge oceans, leading scientists to conclude that all the continents were joined about 200 million years ago.

IN ADVANCE:

Place each fossils in a plastic bag with its fossil description cards. Photocopy the cards at the end of this section. Use a highlight marker to show students what to copy from each card onto their chart. (fossil name, when it lived on earth, location where organisms lived, etc.)

After observing a fossil, students replace the fossils in the bag with its card.

REUSE, RECYCLE: Have students bring in 2 clear, 2-liter soda bottles for the Edible Fossils activity. Have students save yogurt cups and lids for making fossils.

PRETEST:**WHAT IS A FOSSIL?**

Have students answer the question. Review their papers.

After teaching this section, return their paper and have them write everything they learned.

MATERIALS

18 tray

18 fossils in separate plastic bags with their fossil card
magnifier

EXPLORE:**WHY ARE FOSSILS MILLIONS OF YEARS OLD?****WHY ARE MOST FOSSILS OF SMALL ORGANISMS?**

1. **DISCUSS** what a fossil is and how fossils are formed. (see note above)
2. **THE FOSSIL LAB**
OBSERVING FOSSILS: HOW DO THEY DIFFER?
Remind students not to scratch the magnifier with the fossil.
Give each pair of students a tray with one fossil bag and a magnifier in its separate bag. *Have students:* Fold their paper in fourths.
Observe the fossil with a magnifier and draw it.
Label their drawing with the fossil's name, location found, and age.
Pass the trays, on the teacher's signal, every 2 to 3 minutes so everyone sees each fossil.
3. **DISCUSS**
Have students describe the fossil on their desk and read the card out loud. Make a list of all the fossils on the board.
Which fossils is from a big animal. (shark, dinosaur)
Which fossil is the oldest? (trilobite)
Why are most fossils of small animals?
(Only small organisms lived on Earth millions of years ago.)
Which fossil is from a plant? (petrified wood, fern)
Did most of these plants and animals live in the oceans or on land? (oceans)
4. **ANALYZE**
Make a drawing showing the animals that lived long ago, using one or more of the fossils you observed. Have students place the fossil and fossil card in the bag at the end of lesson.

MATERIALS:

Plaster of Paris
sticks of clay
petroleum jelly(cooking oil can used)
18 plastic spoons
10 yogurt style cups with lids
1 bag of shells for making fossils

ART:

MAKING FOSSILS

1. Practice this activity before doing it with your class.
The yogurt lid is for the clay and the bottom cup is for mixing Plaster of Paris.
2. **WHAT IS AN IMPRINT FOSSIL?**
Pass out 6 to 8 shells for students to share.
Students should choose a shell with an interesting shape and form.
Several students can use the same shell.
Cover the shell with petroleum jelly or cooking oil.
Divide each stick of clay into fourths.
Flatten the clay inside the lid of a yogurt cup to fill the ears.
Make an imprint with the fossil (shell) in the clay. Press firmly.
Remove the shell. The shell can be used again by other students without adding more petroleum jelly or oil.
3. Scientists can tell the size and weight of a dinosaur from imprint fossils of dinosaur footprints. In nature, minerals may fill the imprint, and become fossilized over time.
4. **WHAT IS A CAST FOSSIL**
Have the imprint fossil ready.
Measure 4 teaspoons Plaster of Paris into a yogurt cup.
Stir in approximately 2 tsps. of water until the mixture is thick and creamy.
Quickly pour plaster onto 3 clay shell imprint molds.
Remove the 'fossil' after 30-40 minutes, when the plaster is hard.
Reuse the clay imprint for another student or save the clay in a zip lock plastic bag. Wash spoons after stirring. Save *oily* shells in a separate zip-lock bag for other classes or next year.

EXPLORE:

COMPARING AND SORTING

1. **SORTING FOSSILS**

Discuss ways to group fossils, by age, animal or plant, ocean or land, animal with shell/no shell. Pick a method and sort them.

2. SORTING SHELLS

Give each student at least one shell.

Put 2 pieces of construction paper on a table and label:

1 shell – like snails and *2 shells that fit together*. Have students:

Decide if the animal could live in its shell or needs a second shell to cover it to make a safe place of its body.

Sort shells. Observe the shells. How are they alike or different? List ways to sort within one shell group. List the students' ideas on the board.

(e.g., color, shape, size, rough/smooth, symmetrical/not symmetrical)

Sort each group again by a new property.

Leave the shells on a table for students to observe and sort.



NOTE:

EDIBLE EARTH:

Jell-O layers and food bits symbolize rock and fossils to illustrate how fossils are trapped in rock. This activity challenges students to observe that the lowest layer is the oldest. The age of the fossil is dated by the rock that surrounds it. Sediments (mud, sand, shells) become rocks over time due to pressure.

MATERIALS:

6 flavors of Jello-O

6 different foods for 'fossils' (fruits, raisins, nuts) to add Jell-O bowl

mixing spoon

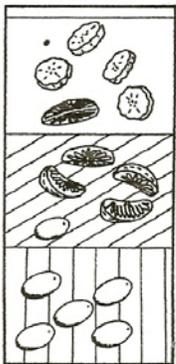
very hot water

tall, clear container for mixing layers in

(Jell-O layers can be 'deposited' in 1 or 2 clear, 2-liter soda bottles with the top 3" cut off.)

Cut the colored plastic base in half so more of the bottom can be seen

EDIBLE EARTH:



1. (*Fossils Trapped in Rock Layers* worksheet at the end of this section) Fossils are trapped in sedimentary layers of rock. Each day add one layer of Jell-O and some 'fossil material' cooling the Jell-O mixture before adding it to the previous layer, which has jelled.

Store Jell-O layers in the refrigerator.

Fossils could be canned orange slices, bananas, raisins, nuts, small marshmallows, strawberries, gummy worms or bears, etc.

(Do Not use papaya, kiwi, or fresh pineapple)

Each layer should contain a new type of 'fossil,' although a few samples from the previous era may be included to show overlapping.

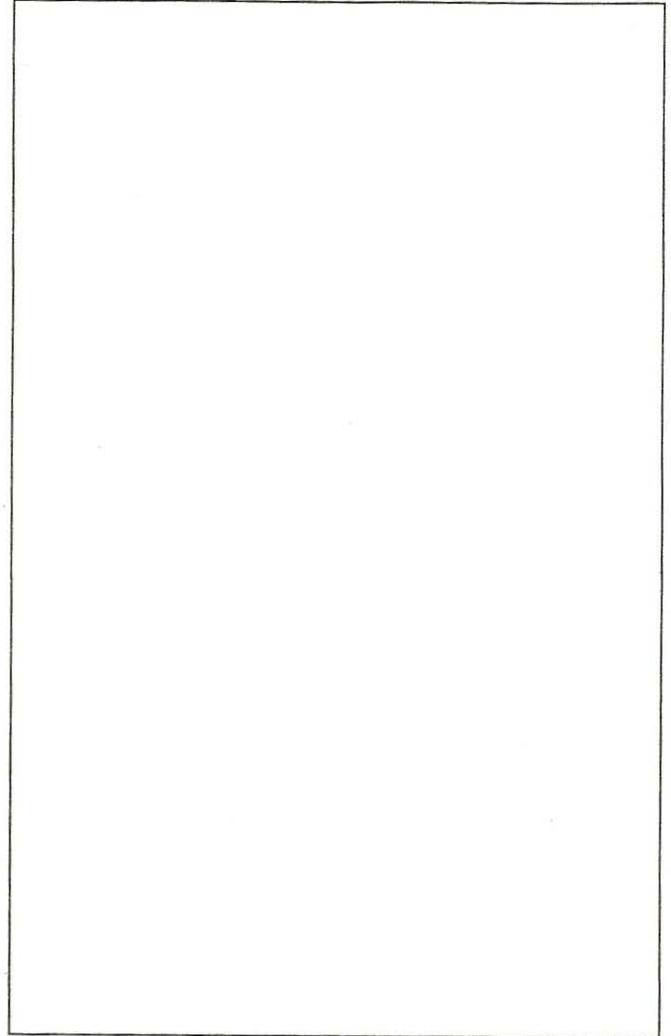
2. Name each era. (Bananacene Period, Berrycene Period)

The layers of Jell-O represent rock strata deposited over time.

Jell-O layers with 'fossils'

FOSSILS TRAPPED IN ROCK LAYERS

Name and draw each 'rock layer' that is added to the jar and the 'fossils' in it.



Which layer is the oldest

The most recent layer is:

Describe the oldest layer
and its fossils.

SAMPLE ANSWER SHEET FOR TEACHER REFERENCE:

'Jell-O layers with 'fossils'

FOSSILS TRAPPED IN ROCK LAYERS

Name and draw each 'rock layer' that is added to the jar and the 'fossils' in it.

How to use the student work sheet:

Have the students draw each layer of Jell-O and the fossils in it.

Jell-O must cool between layers.

Three samples are shown here.

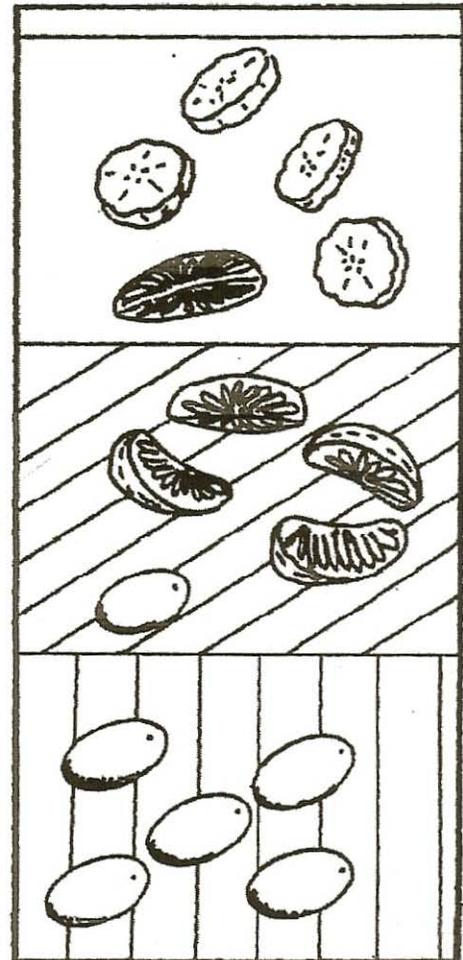
Students can name each layer.

Put the Jell-O in a 2-liter soda bottle with the top cut off .

banancene era
(bananas and orange Jell-O)

orangycene era
(oranges and strawberry Jell-O)

grapeacene era
(grapes and lemon Jell-O)



Which layer is the oldest?

_____ (bottom)

The most recent layer is:

(top)

Describe the oldest layer and its fossils.

(yellow layer with oval green 'plants')

FOSSIL CARDS

(Photocopy, laminate, and place cards in fossil bags.)

<p>Fossil Card</p> <p><u>GASTROPOD</u> 150 MILLION YEARS OLD found in Mexico</p> <p><u>Lived in the ocean</u> This snail lived under water. Look at the patterns on the shell with your magnifier.</p>	<p>Fossil Card</p> <p><u>left blank for</u> <u>teacher's use</u></p>
<p>Fossil Card</p> <p><u>left blank for</u> <u>teacher's use</u></p>	<p>Fossil Card</p> <p><u>left blank for</u> <u>teacher's use</u></p>