BUFFALO PUBLIC SCHOOLS
Department Of Science Education
333 Clinton Street
Buffalo NY 14204

BPS TEAM Science

FIRSTHAND LEARNING, INC
Science Materials Center
2495 Main St., Suite 550
Buffalo, NY 14214

Dear Teacher,

To enhance the educational experience of the *Reading the Environment*, two suggested take home activities have been added to the kit. Consideration needs to be given to the time of year the activities will be sent home and the students' previous experience with graphing, classifying, predicting and the ability to understand basic scientific concepts.

Completed journal responses are an ideal way to check the effectiveness of the learning experience. You should get immediate positive or negative feedback.

Fill in the return date on the parent letter before sending it home. You should provide paper clips and thread for Activity 2.

➢ Activity 1 – My Rock Collection

❖ Objective

- ✓ Students will collect, classify and write a description of their rock collections in their journals
- ✓ End Product - Rock display and completed bar graph

➢ Activity 2 – Growing Crystals

❖ Objective

- ✓ Students will make different rocks by growing crystals
- ✓ End Product - Crystals

Grade 4 – Reading The Environment

Seed Experiment

Activity to be used at the beginning of the kit

- Objective
  - ✓ The students will observe the effect that sprouting plants have on a rock-like surface.

- Concept
  - ✓ Growing plants produce a force that cause rocks to slowly break down by the process of weathering.

- Teaching Hints
  - ✓ Obtain a plastic milk container for mixing the plaster. Mix two parts plaster of Paris with one part water. Soak the seeds for up to 24 hours prior to the experiment. Sprinkle or spray the top of the plaster to keep it moist. Results take two to three weeks. Do not pour the extra plaster down the drain. Throw the entire container in the trash.

  - ✓ This hands-on activity can be used to introduce basic scientific method and experiments. Directions have been simplified for students and teacher. Please refer to the following page.

  - ✓ You can have each child complete this experiment individually or in pairs or in groups. The teacher needs a container to mix the plaster, don't make it too runny. Pour a thin layer, less than a quarter of an inch, slowly and carefully over the lima bean seeds so they don't float to the top of the plaster.

  - ✓ The students will discover the power of seeds. They will observe, on a small scale, just how powerful the simple sprouting of a seed can be. This will take two to three weeks to complete.

- "Seed Experiment" Journal Activity
  1. Write one or two questions about the materials used in the experiment
  2. Make a prediction
  3. Draw a line chart, date on one side and observation on the other as pictured below
  4. Students' record observations each day
  5. At the end write a conclusion and describe the end results

Date	Observation

Seed Experiment

1. Take one clear plastic cup
2. Fill 2/3's of the cup with soil
3. Place 2 or 3 wet lima beans on top of the soil
4. Pour a thin layer of runny plaster slowly on the beans
5. The seeds must be kept moist. Be sure to water them everyday
6. In your journal, label a page "Seed Experiment," make a prediction of what will happen to the seeds.

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Reading The Environment

- You will need to gather empty coffee cans for Learning Experience 12.
- A ½ gallon milk or juice carton works well for mixing plaster of Paris.
- The background list of materials at the end of the manual provides an excellent reference for you.
- Bulldog clips included in this kit are for students' clipboards. A piece of sturdy cardboard, the back of a marble notebook, or a textbook can serve and a base.
- Some teachers have found it helpful to paper clip index cards to their manual pages to use for notes. Remove the cards before returning the manual and when your kit arrives the next year, you will have your note cards to clip into your manual once again.
- Students' science notebook pages – Most recording can and should be done in student journals. Format for the pages can be on the board for bell work or seat work.
- Transparency sheets are included in the kit, as a non-consumable item, for outdoor plot visits. Thirty transparence sheets are available for students to use as overlays for individual drawings on Learning Experience 13 and /or 17.
- The Seed Power activity sheet and information to be used at the beginning of the kit are included.

➢ Suggestions for implementing introductory questions:

- ✓ Can be presented on the overhead or smart board
- ✓ Can be used for bell work or a period of days
- ✓ Can be assigned for homework

In addition to the baby pictures that students are asked to bring in as a part of this kit, you can take photos of students in September and review several months later so that students can observe personal changes. Other information that may be included are, changes in measurement, such as height, shoe size, etc.

Find Something That:

1. Is becoming bigger
2. Is becoming smaller
3. Is becoming smoother
4. Changes very quickly
5. Is a change caused by people
6. Is a change not caused by people
7. Changes with the season
8. Will change for a long time

Number 1-8	Description of the object and how it is changing	How do you know? What evidence do you have?

Fake Rocks

This activity should be done in pairs

- **Please note**
  - Teachers need to make rocks for one week before doing this activity. The fake rocks must air dry.

  - Geologists, are scientists who study the Earth's origin, history, and structure. To discover what different rocks are made of, Geologists must take rocks apart.

- **Objectives**
  - ✓ Students will gain information about fake rocks by:
  - ✓ Using different measuring tools
  - ✓ Observing the rocks and recording their observations
  - ✓ Relating what they have done to the work of a Geologist.

Ingredients for Fake Rocks

- 1 cup, (250 ml) flour
- ½ cup, (125 ml) salt
- 2 tsp., (10 ml) alum
- ½ cup, (125 ml) water
- 3 drops of yellow food coloring
- 5 drops of red food coloring
- 5 drops of blue food coloring
- 1 cup, (250 ml) coarse sand
- ½ cup, (125 ml) gravel

Making Fake Rocks

1. Mix together the flour, salt, and alum in a large Zip-lock bag.
2. Add food coloring and water to the flour mixture
3. Knead the mixture until it is uniform in texture and color and doesn't stick to the bag. If the mixture is crumbly, add a bit more water.
4. Add the sand and the gravel and knead until well mixed.
5. Divide and roll the mixture into 18 pieces (about golf ball size)
6. Flatten the rock until it is about 2 cm thick and place them on a tray covered with paper towels to dry completely

- When dry, Fake Rocks should be able to be broken in half by hand and taken apart with a nail.

Activity

Materials

- ✓ A nail or toothpick for each student
- ✓ Paper towels
- ✓ Clear cups or small jars
- ✓ Hand lenses
- ✓ Balances
- ✓ Ruler

Part 1

- Explain that the students are going to have another chance to work as a Geologist might.
- Show students the fake rocks and discuss what properties they might observe when they examine their rocks.
- Pass out the fake rocks. Students should make observations by looking at the surface of the rock. They should write a description and make a drawing in their journals.
- Pass out hand lenses. Students should now write and draw about their observations with the lens in their journals.
- Students should take measurements, diameter, circumference, height, and weight.

Part 2

- Each student will work with a half rock to carefully separate the different ingredients and make a list of those they can identify in their journals.
- Each pair should break their rock in half. Using a nail or toothpick, they should separate the ingredients and put the gravel aside.
- Ask students to describe the leftover materials and how they think they may separate it further. If they don't suggest mixing some of the leftover rock with water, the teacher should introduce the idea.

➢ Part 3

- Each pair of students should place their leftover materials into a clear cup or jar and add about 25 ml of water, stir or shake. Then make their observations and drawings.

- Ask students what they think would happen if the liquid were poured off and put in a dish to evaporate for a few days. Have them carefully do this.

- When the water has evaporated, students should observe and record what they see. Guide Students in discovering what crystals remained after water has evaporated. Discuss with students where the crystals came from.

Conclusion

Have students reflect in their journals. Reflections may include what they discovered by doing the fake rock activity, feelings about the activity, and any questions they may have.

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Dear Parents

In science class we are learning about the kinds of change that takes place in our environment.

We are providing the following activity to enhance your child's learning experience. We would like you to work with your child to complete this activity.

Please read and complete this activity with your child. The class will share their findings on, _____. All students should return their journals to school daily.

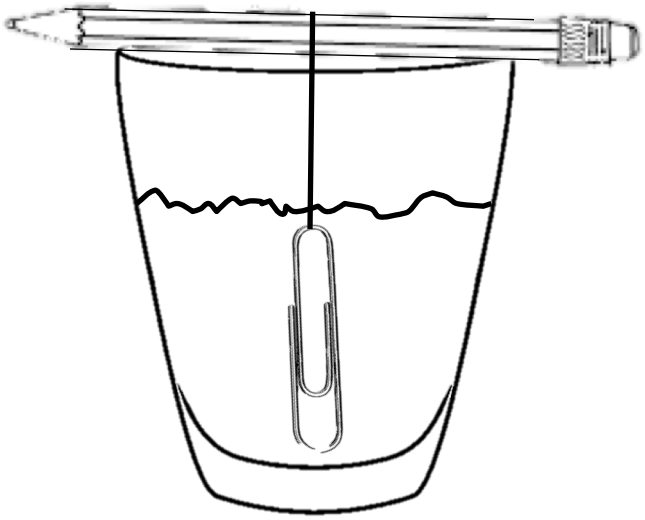
If you have any questions, please feel free to call, email or send a note. I hope you will enjoy doing this activity with your child.

Thank you

Growing Crystals

- What you will need

  - ✓ 1 pint size jar or glass
  - ✓ 2/3 cup of water
  - ✓ salt
  - ✓ 1 paper clip
  - ✓ 1 thin strand of cotton yarn or thread
  - ✓ 1 pencil



- Directions

1. Add 2/3 cup of hot water to the jar.
2. Stir in salt, a few teaspoons at a time, until it will not dissolve anymore.
3. Tie a paper clip to a thin string or thread.
4. Tie the other end of the string or thread to the middle of a pencil and lay it across the mouth of the jar so the paper clip is suspended in salt solution.
5. Illustrate and date the experiment in your journals.
6. Leave undisturbed for several days to a week until crystals grow.
7. Date and illustrate when the crystal forms.

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Dear Parents

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We are providing the following activity to enhance your child's learning experience. We would like you to work with your child to complete this activity.

Rock Collection

Students will collect 12 different rocks and place them in an egg carton
Number each rock 1-12
Illustrate and write a brief description of each rock in their journals.

- Rock #1
  - Color:_____
  - Size:_____
  - Shape:_____
  - Texture:_____

Your child should return their rock collection and journal pages by:
If you have any questions, please call, email or send a note. I hope you enjoy working with your child.

Thank you.

Rock Ranger
Field Guide

Rock

Draw and color the rock

I found this rock:

_____

Describe the rock. Is it, sharp, flat, smooth, shiny, dull, heavy, light, colorful, grainy or crystalline?

_____

_____

_____

I think this rock is called:

_____

It is a:

_____ rock.

Is it sedimentary, igneous, or metamorphic?

Rock Ranger
Field Guide

Rock

Draw and color the rock

I found this rock:

_____

Describe the rock. Is it, sharp, flat, smooth, shiny, dull, heavy, light, colorful, grainy or crystalline?

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I think this rock is called:

_____

It is a:

_____ rock.

Is it sedimentary, igneous, or metamorphic?