

Rocks & Minerals

Experiments & Activities Booklet

Looking at Mock Rocks

Recipe Adapted from:

<http://saltthesandbox.org/rocks/mockrock.htm>

Objective:

- ✓ Students will break apart a rock and observe what is inside.

How to Make Mock Rocks:

Ingredients

- 1 cup flour
- ½ cup salt
- 2 teaspoons alum
- 1 cup sand
- ½ cup water
- 6 drops red food coloring
- 4 drops green food coloring
- 4 drops yellow food coloring
- “Minerals”—tiny beads or stones

Procedure

****Must be made a week before the experiment!****

- 1) Mix the dry ingredients in a bowl, set aside.
- 2) Add the food coloring into the water.
- 3) Pour some water over the dry ingredients and begin to knead it.
- 4) Place some of the “minerals” in the dough and continue kneading.
- 5) Once the dough feels like Play-Doh ©, set on a cookie sheet to dry.
- 6) The mock rocks take about a week to dry.

Materials for Students:

- Science journals
- Three mock rocks
- Three magnifying glasses
- Three nails
- Three pairs of goggles [optional]

What the Students Will Do:

- Instruct the students to break into groups of three.
If you prefer, create science groups before the start of the unit. The same students need to work together throughout the entire unit
- Instruct the students to go to page 11 in their science journals.
- Each group will get the following materials: mock rocks, magnifying glasses, nails, and goggles (optional).
- Each student will get his or her own rock. The students will first observe the rock as a whole and write the characteristics on their sheet. After, they will use the nail to break the rock apart. The students will record what they observe (write and draw) once the rock has been broken apart.
- As a group, the students will each discuss their rock and what they found inside.
- Allow the students about 15 minutes to examine their rocks and write their observations.
- Reconvene and discuss the activity with the students.

Additional Notes for the Teacher:

- If possible, walk around and take pictures of the students working—this is a great resource for a bulletin board.
- Bring in real rocks and allow the students to observe those. The real rocks, however, will be harder to break apart. Have the students compare the real rock with the mock rock and note the differences or similarities.

Effects of Chemical Weathering

Experiment Adapted from:

<http://scienceviews.com/geology/activity4.html>

<http://www.lots-of-kids-games.com/chalk-science-experiment.html>

Objective:

- ✓ Students will observe limestone, calcite, chalk, and quartz in lemon juice and vinegar and state how each rock reacts.

Materials:

- Science journals
- 8 clear plastic cups
- Labels (for each cup)
- Permanent marker
- 2 pieces of limestone
- 2 pieces of calcite
- 2 pieces of chalk
- 2 pieces of quartz
- Lemon juice
- Vinegar
- Tablespoon

Procedure:

****This experiment will be done as a class****

- Instruct the students to break into their science groups.
- Instruct the students, as a group, fill out page 18 in their science journal.
- On a table, place the 8 clear plastic cups. Label the cups lemon juice and vinegar.
- Gather the students and have them stand around the table.

- Show the students the lemon juice and vinegar. Ask them, **“How does lemon juice taste? How does vinegar taste?”**
- Show the students the four rocks and identify each rock.
****Explain that chalk is a rock—the students might not realize this!****
- Ask the students, **“What do you think will happen to each rock when it is placed in the lemon juice? The vinegar?”**
- Place a tablespoon of lemon juice in four cups.
- In each cup, place a rock.
- Place a tablespoon of vinegar in four cups.
- In each cup, place a rock.

Discussing the Results:

- Instruct the students to get back into their science groups.
- Instruct the students to fill out pages 19-21 in their science journal.
- Allow the students to work together for about 15 minutes.
- Reconvene and discuss their observations.
- Provide this information to the students:

Lemon juice and vinegar are both acids. Lemon juice contains citric acid, while vinegar contains acetic acid. These acids are very mild (weak). Rocks that contain calcium carbonate become weak and dissolve when exposed to acid. The limestone, calcite, and chalk all contain calcium carbonate. Because of this, those three rocks had a reaction (bubbling, fizzing) to the lemon juice and vinegar. The quartz, however, does not contain calcium carbonate, which is why it did not have a reaction.

Scratch Test: Looking at Minerals

Experiment Adapted from:

<http://www.education.com/pdf/scratch-test-rock-hardness/>

Objective:

- ✓ Students will use several different types of materials to determine the hardness of minerals.

Materials for the Students:

- Science journals
- "Scratch Test" worksheet (1 per group)
- Minerals: Quartz, Calcite, Gypsum, Fluorite
- Scratch Tools: Penny, Nail, and Paper clip

How to Perform a Scratch Test:

****Demonstrate a scratch test using rock salt****

- When scratching a mineral, you must know the hardness of each tool: fingernail = 2.5 | penny = 3.0 | 5.0-6.0. If the mineral scratches after using one of these tools, you know that the mineral's hardness is less than the hardness of the tool.
- Hold the mineral in one hand and the tool in the other. Scratch the surface. If there is scratch that doesn't rub off, the hardness has been determined.

Procedure:

- Instruct the students to break into their science groups.
- Instruct the students to open to page 25 in their science journals.
- Discuss Mohs Scale of Mineral Hardness.
- Give each group the four minerals, three magnifying glasses, one penny, one nail, and one paperclip.
- Instruct the students to scratch each mineral with each scratch tool and record their observations on their sheet.

Scratch Test: Looking at Minerals

Names _____

Mineral Name	Hardness	Thumbnail	Penny	Paperclip
<i>Quartz</i>				
<i>Calcite</i>				
<i>Gypsum</i>				
<i>Fluorite</i>				

1) Which mineral scratched the easiest?

2) Which mineral was the hardest to scratch?

3) Order the minerals from hardest to softest.

- _____
- _____
- _____
- _____



Image by juhele on Openclipart

Activity: Label the Scientific Method!

- James knows chalk is a soft rock and that lemon juice and vinegar are very acidic. He fills up two cups and puts lemon juice in one and vinegar in another. He puts a piece of chalk inside each cup. He waits a day and records his results. **STEP 5**
James tests his hypothesis by doing an experiment with chalk, lemon juice, and vinegar.
- James wants to know if a piece of chalk will dissolve quicker in lemon juice or in vinegar. He goes on the Internet to search for experiments that have been done on his question. He makes a list of the items he will need to conduct his own experiment. **STEP 2**
James begins looking for information he needs. He looks at other resources and studies to determine what information he needs.
- James predicts that the chalk in the cup of vinegar will dissolve quicker than the chalk in the lemon juice. **STEP 3** *James creates his hypothesis by stating that the chalk will dissolve quicker.*
- James writes a paper explaining his experiment. He writes down his hypothesis, the steps he did, and what the results of his experiment were. He confirms his hypothesis. **STEP 6** *James explains his entire study.*
- At school, James learns that chalk is a type of soft rock. He wonders what would happen if he put a piece of chalk in a cup of lemon juice. **STEP 1** *James learns something new and begins to wonder about it.*
- James determines that if the chalk dissolves quicker in the vinegar than in the lemon juice, the vinegar must be stronger or more acidic. **STEP 4** *James makes an if/then statement.*

Guess the Rock!

Objective:

- ✓ Students will identify a rock based on its characteristics.

Materials:

- “Guess the Rock” worksheet

Directions:

****This is a great activity for the students to do during morning work or if they finish their work early****

- Give each student a “Guess the Rock” worksheet.
- Have the students read each rock's description at the top of the page. The students will look at each picture and write the name on the line.

Answers:

Picture 1 = Phyllite

Picture 2 = Gneiss

Picture 3 = Granite

Picture 4 = Chert

Picture 5 = Pumice

Picture 6 = Rock Salt



Image by reggiecl on Openclipart

Guess the Rock!

Name _____

Chert:

A dark gray rock that contains fossils and crystals.

Gneiss:

Has alternating bands that are light and dark, called "Gneiss Banding"

Pumice:

Very light rock; has holes; made from volcanic dust

Granite:

Type of igneous rock that is white, pink, or gray

Rock Salt:

Colorless mineral that is made up of salt; also called Halite

Phyllite:

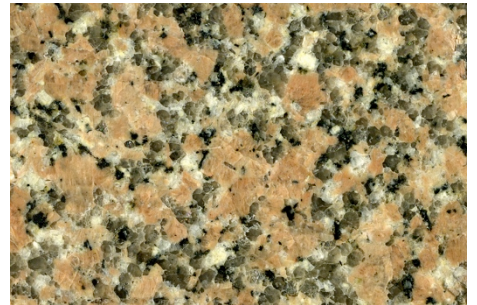
A gray rock that contains fine-grained mica.



[Image on Wikimedia Commons \(\(PD-USGov-Interior-USGS-Minerals\)\)](#)



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Why Does Pumice Float?

Objective:

- ✓ Students will learn about pumice and why it floats.

Materials:

- Plastic tub
- Water
- Pumice stone

Procedure

****This experiment will be done as a class****

- Gather the students and have them stand around a table.
- Show the students the plastic tub, water and pumice stone.
- Ask the students to identify the pumice stone. The students may recognize it as something used by their parents to remove calluses or to clean grills.
- Ask the students to describe the stone—size, color, and characteristics. Pass the stone around and have the students feel it's weight.
- Pour water into the plastic tub and ask the students what they think will happen to the pumice—will it sink or float?
- Provide this information to the students:

Pumice is a very light rock and has many holes. The rock is not dense because of the holes. Because pumice is less dense than the water, it will float.

Birthstones

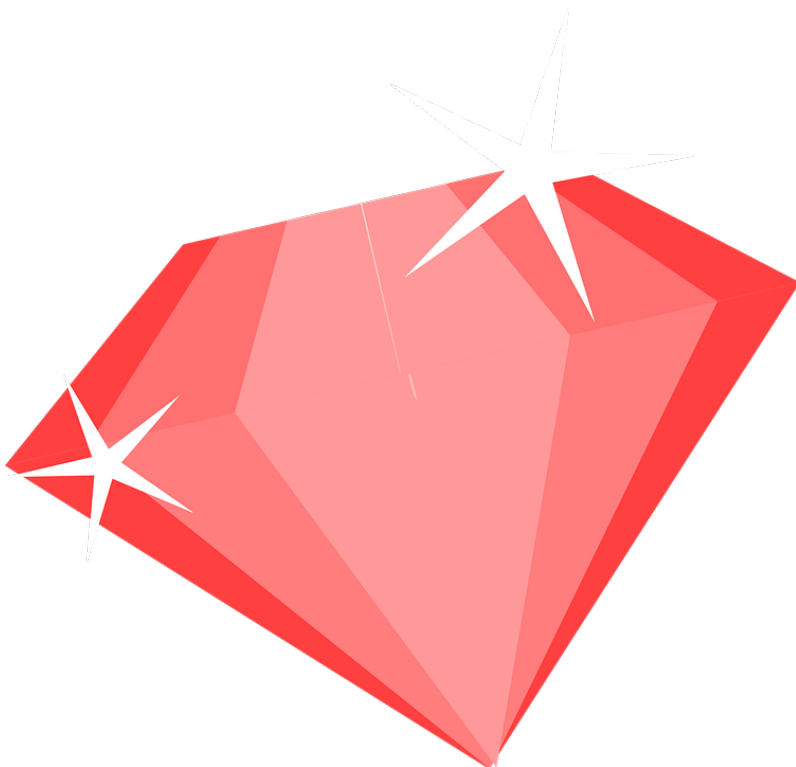
January		Garnet
February		Amethyst
March		Aquamarine
April		Diamond
May		Emerald
June		Pearl
July		Ruby
August		Peridot
September		Sapphire
October		Opal
November		Topaz
December		Turquoise

Activity:

Exploring Birthstones

Directions: Have you ever wondered what your birthstone is? Does your birthstone represent wisdom or strength? Where is birthstone found? Go to the website below to read about your birthstone and the other birthstones. After you finish reading, complete the crossword puzzle on the next page.

<https://www.perrysjewelry.com/education/birthstone-facts-legends>



Exploring Birthstones

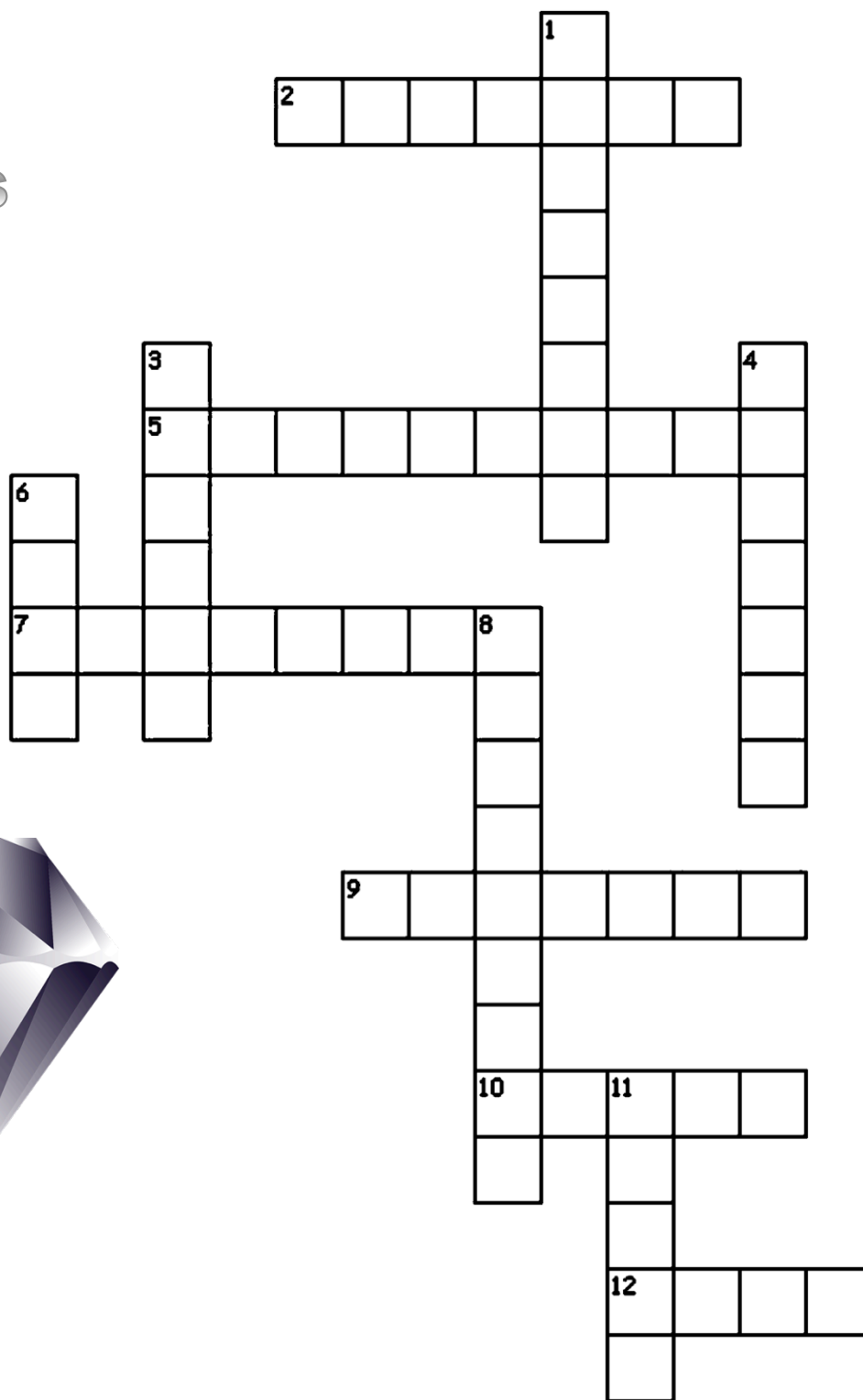


Image by OpenClipart-Vectors on Pixabay

Across

2. May's birthstone that was mined by the ancient Egyptians, Indians, and Incans
5. March's birthstone that can be found throughout Africa
7. February's birthstone which represents royalty
9. number ten on Mohs Scale of Mineral Hardness and also April's birthstone
10. November's birthstone which is worn by people in India to insure long life, beauty, and intelligence
12. July's birthstone whose name comes from the Latin word "rube" or "red"

Down

1. September's birthstone that can be found in any color except red and orange-pink
3. January's birthstone which was once believed to heal diseases related to blood flow
4. August's green birthstone that's been found in meteorites
6. October's birthstone that has a high percentage of water
8. December's birthstone which was one called "blue zoisite" but had its name changed by Tiffany & Co.
11. June's birthstone that is found in an oyster's shell