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Journeys Through the Cycles of Earth!



“Rocks are records of events that took place at the time they formed. They are books. They have a different vocabulary, a different alphabet, but you learn how to read them.”

-John McPhee

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Unit Goals

Journeys Through the Cycles of Earth is a unit based on the cycles of Earth. Each cycle is broken down into a journey and there are activities for each journey. The journeys are the rock cycle, the water cycle and the crystal cycle. Each journey can be used independently and can be differentiated for different grade or learning levels. Each journey has either a hands-on lab or technology project that can be adapted to any subject. The culminating activity is to create a project that demonstrates what each student learned. Students are able to work independently or with a partner.

Journey One ~ The Water Cycle

Our water cycle journey began with learning the essential vocabulary for the water cycle. Students utilized the textbook to create a vocabulary illustration for each word that showed the word, definition, sentence and an illustration. Next, the students watched videos about the water cycle from Promethean Planet. Lastly, the students did a lab that illustrated the water cycle in action. They took a plastic cup with a paper towel and food coloring in it. They filled the cup with water and sealed it in a plastic bag. They attached the bag to the window of the classroom and anxiously observed the changes over the next month. The final step of the lab was to freeze the bags with the remaining water vapor. The students were awed to see that the water vapor turned to snow.

Journey Two ~ The Rock Cycle

Our rock cycle journey began with learning the essential vocabulary for the rock cycle. Students utilized the textbook to create a VIS chart for each word that showed the word, definition, sentence, and an illustration. They watched videos on the rock cycle from Promethean Planet. After learning about the various types of rock students completed the rock cycle lab. They used what they learned about the various types of rocks to correctly identify unknown rocks. The students had to write a story about the rock cycle. Their job was to create at least a two-page short story that utilized at least ten vocabulary words and/or definitions in their story. The resulting stories were then shared with the class.

Journey Three ~ The Crystal Cycle

As part of Journey One and Two, the students learned about crystals and crystal formation. The students completed the crystal-growing lab where students created their own crystals in class using borax, epsom salt or both. The students recorded their observations and took their crystals outside to perform their final observations. The students were then able to take their creations home.

Objectives

1. Students will identify key vocabulary and create a vocabulary illustration for each word.
2. Students will complete a lab that demonstrates the movement of water above, on and below the Earth's surface.
3. Students will explain how water moves through the water cycle.
4. Students will classify rocks according to key identifying characteristics.
5. Students will describe the process that changes rock from one type into another type.
6. Students will explain the process that shapes the surface of the Earth.
7. Students will create a flow chart of the steps in the rock cycle and/or the water cycle.
8. Students will demonstrate the process of evaporation and deposition.
9. Students will create a short story that utilizes ten vocabulary words.
10. Students will explain how the cycling of water between the atmosphere and hydrosphere has an effect on weather patterns and climate.
11. Students will identify patterns in the rock cycle and relate them to surface events and subsurface events.
12. Students will create a borax or epsom salt crystal.
13. Students will complete lab reports for the rock cycle, water cycle and crystal lab.
14. Students will compare and contrast the water and rock cycles.
15. Students will generate, explain, test and defend hypotheses using both inductive and deductive strategies through experimental inquiry.
16. Students will compare and create graphic representations of various concepts.

Science Standards and Benchmarks

Big Idea 7 Earth's Systems and Patterns

SC.6.6: Over geologic time, internal and external sources of energy have continuously altered the features of Earth by means of both constructive and destructive forces. All life, including human civilization, is dependent on Earth's internal and external energy, and material resources.

SC.6.6.1: Describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion, and deposition.

SC.6.7: The scientific theory of the evolution of Earth states that changes in our planet are driven by the flow of energy and the cycling of matter through dynamic interactions among the atmosphere, hydrosphere, cryosphere, geosphere, and biosphere, and the resources used to sustain human civilization on Earth.

SC.6.7.2: Investigate and apply how the cycling of water between the atmosphere and hydrosphere has an effect on weather patterns and climate.

SC.A.1.3.3.3: Determines the effect of a change in temperature on common materials (for example, butter, food coloring in water, isopropyl alcohol).

SC.A.1.3.4.1: Understands that matter may exist as solids, liquids, and gases.

Reading Standards and Benchmarks

LA.6.3.5.1: Prepare writing using technology in a format appropriate to audience and purpose.

LA.6.3.5.2: Use elements of spacing and design for graphics, when applicable to enhance the appearance of the document.

LA.6.3.5.3: Share the writing with the intended audience.

LA.6.1.6.1: Use new vocabulary that is introduced and taught directly.

LA.6.1.6.2: Listen to, read, and discuss familiar and conceptually challenging text.

LA.6.1.6.3: Use context clues to determine meanings of unfamiliar words.

Technology Standards and Benchmarks

LA.6.6.4.1: Use appropriate available technologies to enhance communication and achieve a purpose.

LA.6.6.4.2: Determine and apply digital tools to publications and presentations.

Unit Overview

Journey One ~ The Water Cycle pgs. 8 - 13

Our water cycle journey began with learning the essential vocabulary for the water cycle. Students utilized the textbook to create a vocabulary illustration for each word that showed the word, definition, sentence and an illustration. Next, the students watched videos about the water cycle from Promethean planet. Lastly, the students did a lab that illustrated the water cycle in action. They took a plastic cup with a paper towel and food coloring in it. They filled the cup with water and sealed it in a plastic bag. They attached the bag to the window of the classroom and anxiously observed the changes over the next month. The final step to the lab was to freeze the bags with the remaining water vapor. The students were awed to see that the water vapor turned to snow.

Journey One: The Water Cycle

- a. Vocabulary Introduction
 - b. Water Cycle Flow Chart
 - c. Video Link
 - d. Water Cycle Lab and Observation
-

Journey Two ~ The Rock Cycle pgs. 14 - 24

Our rock cycle journey began with learning the essential vocabulary for the rock cycle. Students utilized the textbook to create a VIS chart for each word that showed the word, definition, sentence and an illustration. They watched videos on the rock cycle from Promethean planet. After learning about the various types of rock students completed the rock cycle lab where they had to use what they learned about the various types of rocks to correctly identify unknown rocks using their notes and their observations. The students had to write a story about the rock cycle. Their job was to create at least a two-page short story that utilized at least ten vocabulary words and/or definitions in their story. The resulting stories were then shared with the class.

Journey Two: The Rock Cycle

- a. Vocabulary Introduction
 - b. VIS Chart
 - c. Video Link
 - d. The Rock Cycle Lab
 - e. The Rock Cycle Story
-

Journey Three ~ The Crystal Cycle pgs. 25 - 31

As part of journey one and two the students learned about crystals and crystal formation. The students completed the crystal-growing lab where students created their own crystals in class using borax, epsom salt or both. The students recorded their observations and took their crystals outside to perform their final observations. The students were then able to take their creations home.

Journey Three: The Crystal Cycle

- a. Crystal Cycle Teacher Notes for Lab
 - b. Lab safety contract
 - c. Crystal Growing Lab Part One
 - d. Crystal Growing Lab Part Two
 - e. Crystal Growing Lab Part Three
 - f. Crystal Growing Lab Part Four
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Journey One: The Water Cycle

- a. Vocabulary Introduction
- b. Water Cycle Research and Flow Chart Activity
- c. Video Link
- d. Water Cycle Lab and Observation

The Water Cycle Introduction

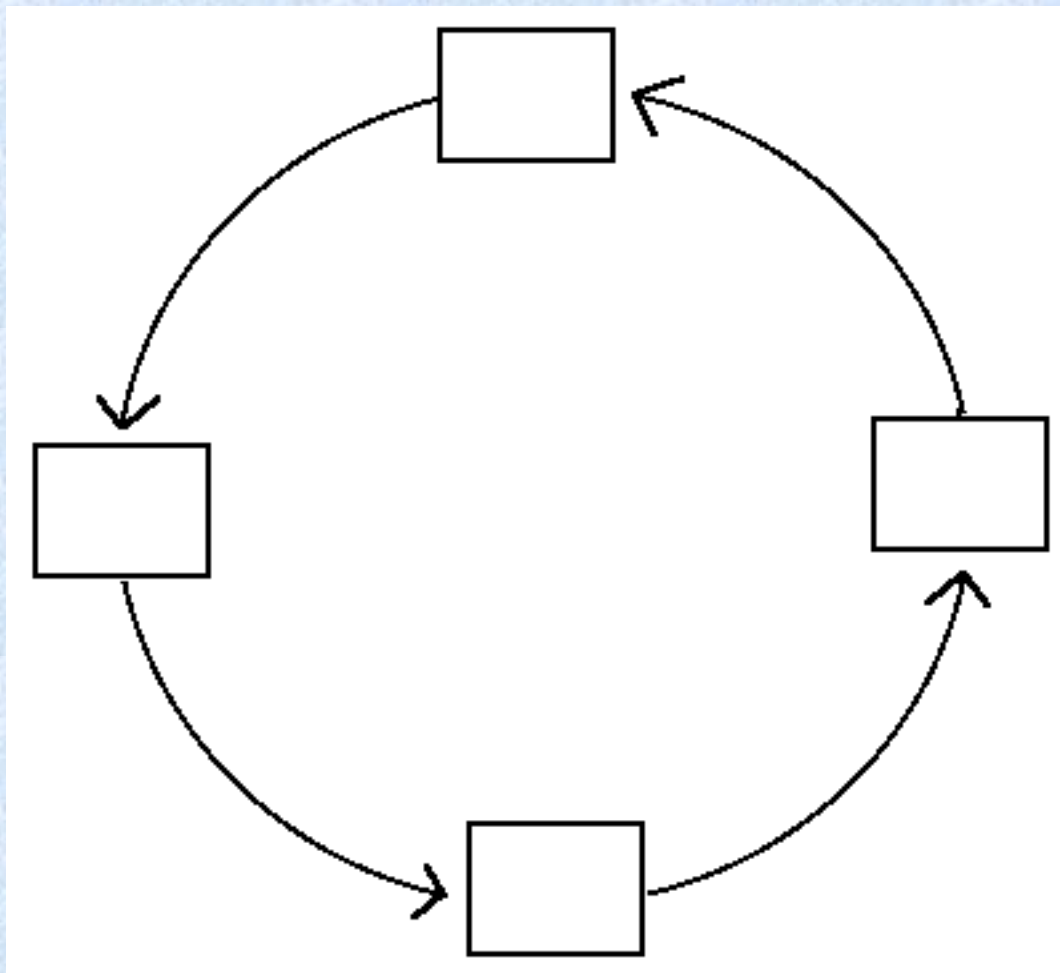
The water cycle is the continuous movement of water from the ocean to the atmosphere to the land and back to the ocean.



The water cycle research and flow chart activity

Directions: Research the following vocabulary words using the Internet. Use your research to create a flow chart that demonstrates the different parts of the water cycle. You may add pictures or additional information if you feel it adds to your presentation.

Key vocabulary: The Water Cycle, Condensation, Precipitation, Evaporation



Water Cycle Graphic

<http://earthguide.ucsd.edu/earthguide/diagrams/watercycle/>

The Water Cycle - Water Science for Schools

<http://ga.water.usgs.gov/edu/watercyclehi.html>

Water Cycle Video

You may view one or all. Have students take notes while watching the videos. There are also a few Spanish versions of the videos.

Go to BEEP

Click on United Streaming (Discovery Education)

In the search type the following titles:

View Bill Nye: The water cycle

View Weather Smart: The Water Cycle and Clouds

<http://player.discoveryeducation.com/index.cfm?guidAssetId=A67F6299-8E81-4136-97A5-582DBCE98CD8&blnFromSearch=1&productcode=US>

Teacher Water Lab Set Up Pictures



Water Cycle Lab Teacher Set Up

1. Put students up in groups of four.
2. Have each student copy the lab form off the board prior to completing the lab. If you have younger students, ESE or ESL students they may receive copies of the form.
3. Have one student come up and get the materials.
4. The students must follow the procedures to complete the lab.
5. Hang the bags on a window with tape. Hang some in the sun and some with indirect sun.
6. Observe the changes over time. I left mine up for three months. The students were excited to see the changes over time. This also helped reinforce the concept of the water cycle.
7. After a few months, I took a few of the bags and put them in the freezer. I asked them to record their observations. Snow formed on the bag. They were excited to see this transformation. It also allowed each student to feel real snow.

Materials Needed

1 Zip close sandwich bag per group

1 Small piece of paper towel per group

Food coloring – be sure to use a variety of colors as this creates interesting observations for the students.

4 oz. Clear plastic cups

Tape

Water

Window

Water Cycle Lab

Warm Up: Answer in complete sentences.

1. Write three real life examples of the water cycle.
2. Why is the water cycle important to the environment?
3. Why is the water cycle important for people?

Materials

1 Plastic bag

1 4 oz. Clear Plastic Cup

Water

1 small piece of paper towel

4 drops of food coloring

Procedures

1. Place paper towel in cup.
2. Fill the cup halfway with water.
3. Put all materials in bag and close.
4. Affix bag to a sunny window. Observe changes over the next 3 days.

Observations

1. Make three predictions about what you are going to observe.
2. For the next three days write what changes you observe. Draw and label a picture for each day.

Follow Up Questions

All answers must be at least 3 sentences long.

1. What changes did you observe?
2. What surprised you the most about the experiment?
3. Did the changes happen faster or slower than you thought?
4. Did all the all the experiments change at the same rate? Why do you think this is?
5. Describe one change that surprised you the most?
6. What would happen if...? Describe three changes you would make to this experiment.
7. What do you think would happen if we froze the bag?

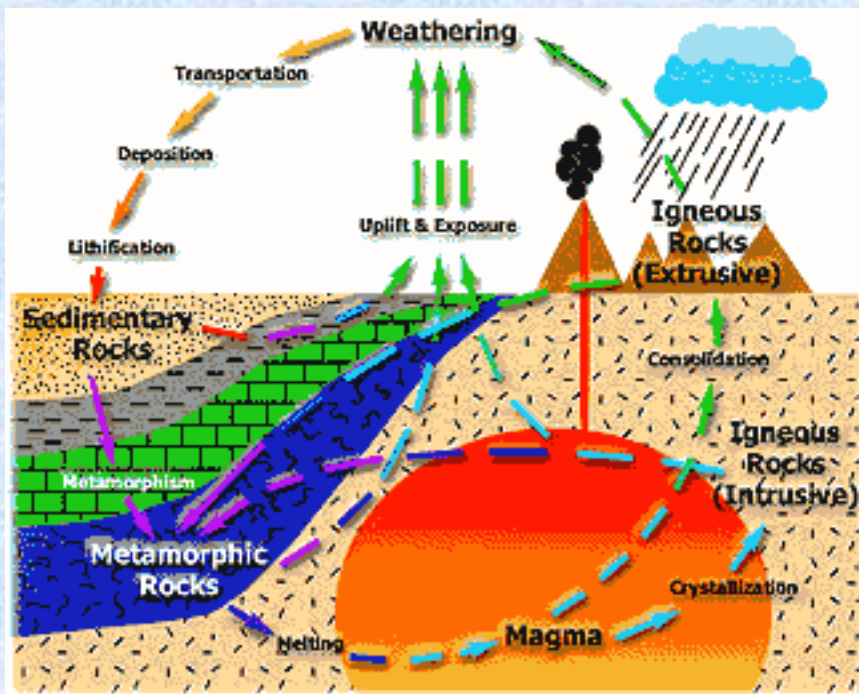
Water Cycle Lab Observations

Day Draw and Labeled Illustration	Write at least 3 observations daily in complete sentences.	Write one prediction about your experiment.

Journey Two: The Rock Cycle

- Vocabulary Introduction
- VIS Chart
- Rock Identification Booklet
- Video Link
- The Rock Cycle Lab
- The Rock Cycle Story

The rock cycle – is the continuous process by which new rock forms from old rock material. It changes from one rock to another, is destroyed, and forms again by geologic processes.

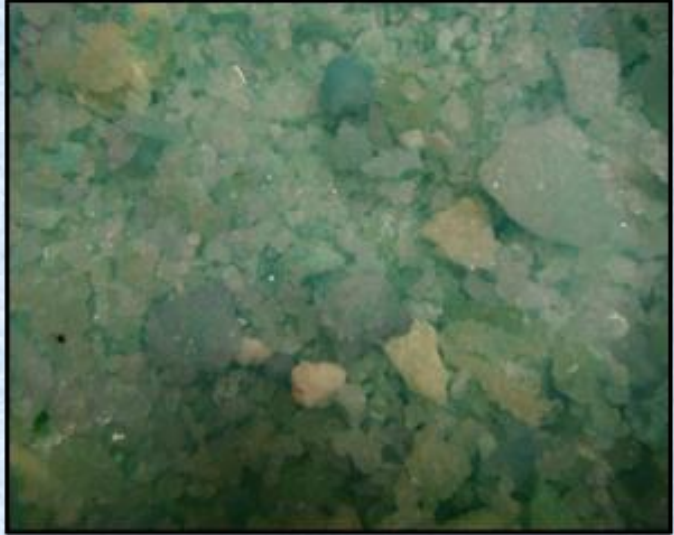


From Google Images

Essential Rock Vocabulary Introduction

The teacher introduces the vocabulary words. I broke them down by section. I introduce no more than 10 vocabulary words at a time. I included all the different types of vocabulary words that I used while teaching about rocks. You may use what you like. The vocabulary is essential for understanding the rock cycle and for completing the rock cycle story. Here are a few options for introduction.

1. Provide the vocabulary words. The students define them using the Internet or their Science book.
 2. Create a slideshow with the words and have them copy them.
 3. Provide the words and definitions. Complete a VIS chart of the essential vocabulary. See next section.
 4. Create a vocabulary comic strip.
 5. Create a rock identification booklet for each rock type.
-



Essential Rock Vocabulary

Rock – a naturally occurring solid mixture of one or more minerals and organic matter.

Mineral – a naturally formed, inorganic solid that has a definite crystalline structure.

Composition – the chemical makeup of a rock; describes either the minerals or other materials in the rock.

Texture – the quality of a rock that is based on the sizes, shapes, and positions of the rock's grains.

Deposited – laid down.

Igneous rock forms when hot igneous rock called magma cools and hardens. Igneous rock forms within Earth and on Earth's surface.

a. Intrusive igneous rock – form deep inside Earth.

b. Extrusive igneous rock – form from lava that has erupted at Earth's surface.

Metamorphic rock forms when rock is heated and squeezed. The rocks structure, composition, and texture have changed, or metamorphosed, from those of the original rock.

Metamorphic rock textures:

a. Foliated – banded

b. Nonfoliated – non-banded because it has only one mineral.

Sedimentary rocks form when rock breaks into smaller pieces and those pieces cement together.

Grains – fragments of rocks

Sediment – grains of rock or minerals.

Sedimentary rock types:

a. Fine-grained texture rocks – are made of very small crystals or grains

b. Coarse-grained texture rocks – made of crystals or grains that can be seen with the eye.

c. Medium grained texture rocks – texture that is between fine-grained and coarse-grained rocks.

d. Sediment – grains of rock or minerals.

e. Clastic sedimentary rock – form when sediments are buried, squeezed together, and cemented by minerals.

f. Chemical sedimentary rock – form when minerals crystallize out of a solution.

e. Organic sedimentary rock – form when the shells and skeletons of dead marine organisms are buried and cemented together.

The rock cycle – is the continuous process by which new rock forms from old rock material. It changes from one rock to another, is destroyed, and forms again by geologic processes.

Weathering – the natural process by which atmospheric and environmental agents, such as wind, rain and temperature changes, disintegrate and decompose rocks.

Types of weathering:

a. Mechanical weathering – the breakdown of rock into smaller pieces by physical means. Agents of mechanical weathering include ice, wind, water, gravity, plants and animals.

b. Abrasion - the grinding and wearing away of rock surfaces.

c. Chemical weathering – the process by which rocks break down as a result of chemical reactions. Common agents are water, weak acids and air.

d. Acid precipitation – Rain, sleet and snow that have a high concentration of acids.

e. Differential weathering – the process by which softer, less weather resistant rocks wear away at a faster rate than harder, more weather resistant rocks do.

Erosion – the process by which wind, water, ice or gravity transports soil and sediment from one location to another.

Deposition – the process by which material is laid down.

Uplift – the process by which regions of the Earth rise up to higher elevations.

Soil – a loose mixture of rock fragments, organic material, water, and air that can support the growth of vegetation.

Parent rock – a rock formation that is the source of soil.

Bedrock – the layer of rock beneath soil.

Soil texture – the soil quality that is based on the proportions of soil particles.

Soil structure – the arrangement of soil particles.

Soil fertility – A soils ability to hold nutrients and to supply nutrients to a plant.

Humus – the dark, organic material formed in soil from the decayed remains of plants and animals.

Deforestation – clearing of trees from an area without replacing them.

Desertification – the process by which land becomes more desert-like.

Rock Identification Booklet

Procedures:

1. Take six pieces of paper, stack them up and fold them in half.
 2. Staple the sides of the booklet
 3. Label the front cover **Rock Identification Booklet**
 4. Create three sections in your book:
 - a. Metamorphic Rock
 - b. Igneous Rock
 - c. Sedimentary Rock
 - d. Minerals and additional information
 5. For each type of rock list the following information:
 - a. Definition
 - b. Picture
 - c. Identifying characteristics
 - d. Names of rocks that are that type.
 6. You may do additional research at home. Add any notes that you feel are necessary to increase your understanding of the material.
 7. Keep this booklet with you at all times. You may add information from the video.
-

Rock Video

Access videos through B.E.E.P. on United Streaming (Discovery Education).

I have students take notes during the videos. They can include the information they learned into their Rock Identification Booklet.

Basics of Geology: All About Rocks and Minerals

<http://player.discoveryeducation.com/index.cfm?guidAssetId=20658F49-12F3-4C35-AFAA-C791276E64AC&blnFromSearch=1&productcode=US>

Rock Identification Lab Teacher Information

We have premade rock sets. I give one set to each group of students. The list with the correct names and description is removed prior to the lab. The names of the rocks on the board and allow them to guess which rock is which. The students are allowed to use their notes from the videos and the vocabulary words.

It took students two days to complete the lab. We reviewed the correct answers and I explained the identifying characteristics for each rock.

If you can't afford the sets, you can have the students bring in various rocks that they collect. They can bring in rocks that they find from outside. If you buy only one set you can pass the rocks around one rock at a time.

Rock Identification Lab

1. Put students up in groups of four.
2. Have each student copy the lab form off the board prior to completing the lab. If you have younger students, ESE or ESL students they may receive copies of the form.
3. Have one student come up and get the materials.
4. The students must follow the procedures to complete the lab.

Materials

Hand lens at least one per pair

Various rock types or a rock set

Nasco Rock Collection

Product Number: SB10942M

Price: \$22.00



Rock Identification Lab

Materials

Hand lens

Various rocks

Rock identification booklet

Procedures

1. Examine each rock. Feel it, look at it closely. Use the hand lens to examine it even closer.
2. Identify the key characteristics for each rock.
3. Try to classify each rock using an educated guess as sedimentary, igneous or metamorphic.
4. Make an educated guess about the type of rock that it is.
5. Draw a picture of each rock.

Name Date Period Rock Identification Lab <u>Types of Rocks</u> Igneous Sedimentary Metamorphic	a. Guess Name b. Guess Type c. Write at least 5 key characteristics of each rock. d. Draw a picture of each rock
1. a. b. c. d.	2. a. b. c. d.
3. a. b. c. d.	4. a. b. c. d.
5. a. b. c. d.	6. a. b. c. d.

Rock Cycle Story

Objective: Create a two-page (minimum) rock cycle story that incorporates at least 10 vocabulary words from our lessons on the rock cycle.

Answer the following questions prior to starting your essay.

1. Choose which type of rock you would like to be.
2. Think about what might happen to him/ or her while they transform.
3. Describe your rocks adventures in detail.
4. Be sure to include scientific information to explain what is happening to your rock.
5. Be sure to include all phases of the rock cycle.
6. You may include illustrations.
7. Be creative, you can go through time, create a comedy skit, write about its daily life at certain points, or friends they meet along the way.

Additional Ideas

A day in the life of

How I went from a mountain to a piece of sand

Places I have traveled

Friends I have met along the way

Things I have seen or experienced just lying around.

Grading:

Your story will be graded on the following components:

- Proper use of terminology (magma vs. lava, intrusive/extrusive, etc.)
- Accurate and thorough description of the processes and conditions that cause you to change.
- Good physical description of what you would look like at each stage of your rock cycle and the proper name that would be given at each phase.
- Creativity
- Minimum 2 pages
- Grammar and spelling are counted as part of the grade.
- The final story must be neatly completed.
- Correct use of at least 10 science vocabulary words.

Bonus Points will be awarded for the following:

- Use technology to compose your final story.
- Use additional vocabulary words
- Add illustrations
- Be funny

Be sure that use the following items while completing your story:

VIS chart, Rock Identification Booklet, Notes from class

Journey Three: The Crystal Cycle

- a. Crystal Cycle Teacher Notes for Lab
 - b. Lab safety contract
 - c. Crystal Growing Lab Part One
 - d. Crystal Growing Lab Part Two
 - e. Crystal Growing Lab Part Three
 - f. Crystal Growing Lab Part Four
-

Crystal Growing Lab Teacher Notes

1. **SAFETY:** Student and teacher safety is key with this assignment. Please review the safety rules on the attached lab safety contract with your students prior to starting this lab. If the students are going to be stirring the mixture they **MUST HAVE A SIGNED LAB SAFETY CONTRACT.**
2. I have varied this assignment from class to class. Depending on the size of the jar you may need to add more water or borax. **HINT:** The more borax or epsom salt you add the bigger the crystals.
3. The water must be **BOILING** or the crystals will not form properly and sometimes not at all.
4. Be sure the students mix it until there is no sediment at the bottom of the jar. The crystals may still form. Sometimes they tend to stick to the bottom of the jar.
5. The borax crystals form within 24 hours. The epsom salt takes a few days. If you mix both it takes more than a week.
6. I set a table up by my cabinet where I boiled the water. I worked in groups of four at a time. It takes time to boil the water.
7. While the water is boiling, the students put on goggles and apron. They construct their shape with the pipe cleaner. Attach to the string and hang it to the appropriate level in the jar. **Remove shape from the jar and lay on the table.**
8. Students add the borax or epsom salt and food coloring to the jar.
9. **TEACHER adds the boiling water while wearing heat resistant gloves.**
10. Student stirs the mixture until there is no sediment at the bottom of the jar.
11. Student add the shape hanging from the pencil being sure **NOT TO TOUCH THE JAR OR THE LIQUID AS IT IS BOILING HOT.**

12. TEACHER WEARS THE HEAT RESISTANT GLOVES AND MOVES THE EXPERIMENT TO THE FINAL LOCATION.

****AT NO TIME SHOULD THE STUDENTS HANDLE THE BOILING WATER OR THE HOT JARS. ****

****ALSO, THE STUDENTS NOT COMPLETING THE LAB NEED TO REMAIN SEATED IN THEIR DESK. THEY SHOULD BE GIVEN A DIFFERENT ASSIGNMENT TO COMPLETE DURING THIS TIME.**

Materials

About a month before the lab collect a glass jar from each student. Have them label their name and period. The small salsa jars work best. It must be glass. The crystals will not form in plastic.

Teacher Set Up Materials

5 aprons	5 goggles	4 scissors
One for each student: Jar Pencil Pipe cleaner Piece of string Tape	3 hot plates	3 volumetric flasks water paper towels for clean up
3 boxes of borax or epsom salt for 100 students	Heat resistant gloves	Food coloring

Teacher Station Set Up Materials

3 hot plates
3 volumetric flasks
Water
Heat resistant gloves

Student Station Set Up Materials

Apron
Goggles
Scissors
Tape
Pencil
Spoon
Pipe cleaner
Food coloring



6-12 Safety in Science Student Laboratory Contract

I have been instructed in the necessary safety procedures required in this course. I agree to abide by the following guidelines:

1. Safety apparel will be worn when specified by the instructor.
2. Long or loose hair will be tied back. Excessively loose clothing or jewelry will not be worn.
3. All safety rules and regulations will be followed.
4. There will be no drinking or eating in the laboratory.
5. Experiments will be done in the specified order with the prescribed quantities of chemicals.
6. Only the chemicals specified by the teacher will be used. No unauthorized experimentation will be done.
7. The proper use of safety equipment and correct evacuation procedures will be followed.
8. Wash hands thoroughly before beginning and after completing an experiment.
9. Contact lenses will not be worn during specified experiments.
10. Horseplay or other inappropriate behavior will not be tolerated during laboratory experiments.
11. Never taste chemicals or smell them directly.
12. Never pick up broken glass with bare hands.
13. Report all accidents, no matter how minor, to the teacher.
14. Never work without teacher supervision in the lab.
15. Do not remove any chemicals or equipment from the lab without the teacher's permission.

Failure to follow these guidelines may result in reduction in grade, disciplinary action, and/or exclusion from laboratory activities.



I have been instructed in the necessary safety procedures required in this course. I agree to abide by the laboratory safety guidelines

Student Name (please print): _____

Student Signature: _____

Parent Signature: _____ date: _____

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Adopted from School Board of Broward County Safety, Policies and Procedures in Science Handbook
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Crystal Growing Lab

Part One

Materials

Apron

Scissors

Goggles

Tape

Volumetric Flask

Borax or Epsom Salt

Boiling water

Jar

Food coloring

String

Pipe cleaner

Pencil

Spoon

Vocabulary ~ Please define

Dependent variable

Independent variable

Procedures

Indicate which procedures are for teacher (T), student (S) or both (B).

1. Review all safety procedures.
2. Create a shape with the pipe cleaner. Attach to string then hang around the pencil.
3. Hang shape so it almost hits the bottom of the jar. Use tape if necessary.
4. Measure 6 teaspoons of borax into the jar. Add 4 drops of food coloring.
- 5. Teacher will pour in one cup boiling water.**
6. Stir until all the borax or epsom salt is dissolved.
7. Hang shape in mixture.
- 8. The teacher will carry the jar to the designated location.**
9. Leave undisturbed for four days and record your observations.

Crystal Growing Lab

Part Two

Directions: Complete the observation form. You must have the following.

- a. Labeled diagram
- b. At least two sentences that describe your observations of your experiment. Be sure to include the changes that have occurred to your experiment.
- c. At least one sentence which describes a prediction about your experiment.

Day 0 Labeled Diagram	Observation	Prediction
Day 1		
Day 2		
Day 3		

Crystal Growing Lab

Part 3

Questions

Write at least 2 sentences for each.

1. Where do you think the crystals are going to form and why? You may draw a diagram.
 2. How long do you think it will take the crystals to form?
 3. Do you think all the crystals on the all the projects will look the same and why?
 4. What would you change on the experiment? What do you think the result will be?
 5. What are the independent variables in our experiment? How do you know?
 6. What are the dependent variables in our experiment? How do you know?
-

Crystal Growing Lab

Part 4 Complete after 3 days.

Questions

Write at least 2 sentences for each.

1. What did you observe on your final crystal creation?
2. Did your crystal take a long time to form?
3. Was it faster than you expected?
4. Why do you think that some of the crystals did not form?
5. What was your favorite part of this lab?
6. What would happen if..? Describe 3 changes you would make to this lab?

Final Assessment Activity

Create a class compare and contrast chart for the water, rock and crystal cycles.

Directions:

- a. Fold your paper in half. On the front write the water cycle and the rock cycle. On the back write the crystal cycle and how the three cycles are similar.
- b. Under each heading write what is different about each cycle. Please be specific and use your notes.
- c. In the last box, write how the cycles are the same.
- d. You will be called on to include your information in the class chart.

The Water Cycle
The Rock Cycle
The Crystal Cycle
How are the three cycles similar?

Budget

Materials	Amount	Total price
Hot plates	3 @ \$159.50	\$478.50
18.5" Heat resistant gloves	1@ \$28.75	\$28.75
Erlenmeyer flask	6@ \$3.00	\$18.00
Hand Lens	22@ \$3.30	\$72.50
	Vendor: Nasco Science	Total = \$597.75
Cups	2 packages	\$4.00
Plastic Baggies	2 Packages	\$1.50
Food Coloring	2 packages	\$4.00
Pipe Cleaners	2 packages	\$8.00
Tape	2 packages	\$3.00
String	1 roll	\$2.00
Crayons	22 Packs	\$22.00
Colored Pencils	22 Packs	\$22.00
Borax	4 boxes	\$12.00
Pencils	12 Packs	\$12.00
Digital Camera	\$100	\$100
External Hard Drive	2@ \$100	\$200
	Vendor: Walmart	Total: \$390.50

Total Budget \$988.25

Partial Picture Supply List



Dual Lens Magnifiers
Product Number: SB26621J
Vendor Nasco

Borax Laundry Booster in the laundry detergent section.



Heat Resistant Gloves 18-1/2"
Scienceware Clavies Biohazard Autoclave
Gloves
Product Number: SB39276M
Vendor: NASCO

Hot Plate
Vendor: NASCO
Scholar 170 Hot Plate
Product Number: SB45547



Product Number: SB26518M
Vendor: NASCO



1000 ml Erlenmeyer flask

Nasco Rock Collection
Product Number: SB10942M
Price: \$22.00

Unit Adaptation Ideas

a. What would happen if...?

I use this strategy for each lab I do. The students have the opportunity to change one thing (the independent variable) in the experiment. This allows the students to take ownership of the experiment. It also creates excitement about learning Science. My students talk about the experiments at home and tend to repeat them when possible.

b. 1st Grade Rock Day

My son was so excited about making crystals and learning about rocks at home with me that he got his whole class excited. His class did a whole “Rock Day”.

1. Students brought in their favorite rocks. The students talked about their rocks and passed them around.
2. Creating crystals – Students brought in jars and created their shapes. The teacher poured the borax and water solution into the jars. He inserted the pipe cleaner creations. The next day the students studied their crystal creations.
3. Rock music – The students listened to rock music. The teacher also played his own guitar for the class.

c. The Rock Cycle Story in the school Literary Fair

As the students began writing their rock stories, their excitement increased. They wanted to be sure that they turned in quality work. They asked their language arts teachers to edit their stories. The teachers were impressed with their quality of writing and their correct infusion of vocabulary. The stories were added to our school’s literary fair in a special category titled: Short stories that incorporate scientific vocabulary. The students were excited to showcase their work in such a special way.