Colorful Crayon Rock Cycle

Overview: Sedimentary, metamorphic and igneous rocks each form in different ways. You can use use crayon shavings to help explain how each type forms.

Procedure:

1) Ask students to recall the three different types of rocks. Have students write down anything they can remember about the three types of rocks.
2) Provide pocket chart with pictures for students to match rock types to descriptions.

Sedimentary

1) Have the students take some of their crayon shavings and sprinkle them onto a square of aluminum foil. Tell students that these are the sediments that are going to start making up their rocks.
2) Remind students that sedimentary rocks are formed by pressure. Ask students how they could add pressure to their sediments.
3) Allow students to add pressure anyway they can. Push on it with their hands, stomp with a foot, or stack some heavy books. You will need a LOT of pressure, so make sure the students add plenty. (You will want to make at least two rocks, one for metamorphic and one for igneous later on)
4) Unwrap the foil carefully very carefully (this is the most delicate of the rocks). Have the students make observations aloud and then record them on paper.

Metamorphic

1) Introduce metamorphic rocks. Have the students make a raft for the crayon rock to sit on.
2) Pour boiling water into a mug and place the crayon raft onto the water. Watch as the crayon starts to melt (about 15 seconds) and remove it quickly (you don't want the crayon to melt completely). Cover the crayon with the aluminum foil and gently add some pressure. You won't need nearly as much as the sedimentary because the crayon is already soft.
3) Unfold the foil and have the students make observations and record them on paper.
4) Ask students to recall how metamorphic rocks are formed. Tell students they will need to add heat and pressure.

Igneous

1) Discuss igneous rocks and ask students to describe how they are formed.
2) Have students make another raft. Repeat the steps for metamorphic rock, however this time allow the crayon to melt completely. Take a popsicle stick and mix the melted crayon together. When the crayon is mixed, removed it from the water and let it cool. You can put the boat on a cup of ice water if you need it to cool more quickly.
3) Have the students ask what you used to change the rock this time. This time hot magma cooled and changed into a rock.

4) Allow the students to make observations and record them.

You can compare and contrast the different types of rocks as a review with the student.

SCIENCE

5S-SI 1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which

a: distinctions are made among observations, conclusions, inferences, and predictions.

b: objects or events are classified and arranged according to characteristics of properties

e: predictions and inferences are made, and conclusions are drawn based on data from a variety of sources

f: independent and dependent variables are identified

g: constants in an experimental situation are identified

h: hypotheses are developed as cause and effect relationships

l: models are constructed to clarify explanations, demonstrate relationships, and solve needs.

5S-SI 2 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which

a: items such as rocks, minerals, and organisms are identified using various classification keys

e: independent and dependent variables are identified

f: constants in an experimental situation are identified

g: data are collected, recorded, analyzed, and communicated using proper graphical representations and metric measurements

i: inferences are made and conclusions are drawn

j: models are constructed to clarify explanation, demonstrate relationships, and solve needs.

5S-ESS 4b The student will investigate and understand important Virginia natural resources. Key concepts include minerals, rocks, ores, and energy sources.

Extension Idea:

Students can learn about rock types that are found in Virginia.

5S-ESS 6 The student will investigate and understand how Earth's surface is constantly changing. Key concepts include:

a: identification of rock types

b: the rock cycle and how transformations including between rocks occur

8S-SI 1a: The student will demonstrate an understanding of scientific reasoning,

logic, and the nature of science by planning and conducting investigations which observations are made involving find discrimination between similar objects and organisms.

HSS-EMP 2 The student will investigate and understand the rock cycle as it relates to the origin and transformation of rock types and how to identify common rock types based on mineral composition and textures. Key concepts include

a: igneous rocks
b: sedimentary rocks
c: metamorphic rocks

HSS-COT 1a The student will investigate and understand that many aspects of the history and evolution of Earth and life can be inferred by studying rocks and fossils. Key concepts include traces and remains of ancient, often extinct, life are preserved by various means in many sedimentary rocks.

Extension idea:
Students can learn how fossils form in sedimentary rocks. They can see how the object can be preserved due to all the pressure that is put on the rocks.

8S-FME 5 The student will investigate and understand the nature of matter. Key concepts include

c: solids, liquids, and gases;
d: physical properties;
e: chemical properties;
f: characteristics of types of matter based on physical and chemical properties

Extension idea:
Students can learn the nature of matter. After seeing the change from solid into liquid and back into a solid, the concept of the properties of matter can be introduced. The crayons changed from solid to liquid and back to solid, but did they change physically? Did they change chemically? How do we know?

READING & WRITING

3E-RW 2a The student will use newly acquired vocabulary drawn from reading and other content areas.
b: demonstrate understanding of the meaning of newly acquired vocabulary.

3E-CN 1g: The student will sequence at least two steps in a procedure or ideas/incidents in an event.

4E-CN 1d: The student will interpret information presented visually and orally.

5E-RW 1f: The student will demonstrate understanding of content-specific words.

8E-RW 1e: The student will acquire and use content words and phrases.

8E-WP1a: The student will write to convey ideas and information including facts, details, and other information
d: The student will use content specific vocabulary when writing about a

topic.

8E-WP 5b: The student will write to convey ideas and information clearly including facts, details and other information.

c: The student will produce writing that is appropriate for the task, purpose, or audience.

HSE-WP1b: The student will write to convey ideas and information using clear organization and including facts, details, and other information as well as graphics and multimedia as needed.

d: The student will produce writing that is appropriate to a particular task, purpose, and audience.

HSE-RW2c: The student will acquire and use new words and phrases.

HSE RW3c: The student will demonstrate knowledge of the meaning of words and phrases from reading and other content areas by using content.

Extension Idea:

Upon completion of this experiment, students will write a text that summarizes their experiences and findings. This can be a fun way for the students to demonstrate what they have learned. Particular attention may be given to content words, figurative language, and sequence of events. Encourage students to include illustrations, tables, graphs, and digital photographs. Texts might take the form of a PowerPoint presentation, book, journal entry, newsletter, or blog. These texts might make great additions to self-selected reading libraries.

MATH

3M-MG2b: The student will identify standard units of measure for mass and volume

Extension Idea: Have the students weigh their crayon shaving before and after experiments.

7M-PSPFA 1a The student will describe the probability of events occurring as possible or impossible.

Extension Idea: Have students predict if it is possible or impossible for rocks to transform from sedimentary to metamorphic and from metamorphic to igneous.

Materials Needed:

-crayon shavings (three different colors: ie red, blue, yellow)
-aluminum foil
-very hot water
-mug
-heavy books
-ice water (optional)
- data collection sheet for prompt responses and observations

Instructional Setting:

This activity can be done at a table in a general education or special education classroom . You will need access to something that can make hot water (hot water pot, microwave, etc). An adult will need to perform some of the steps.

Community Connections and/or Peer Interaction:
-Students can work together or in small groups.
-Students can be paired with typically developing peers.
-Use the newly created crayon rocks in art class.

Functional Activity/Routine:
This activity encourages functional skills such as following instructions and cleaning up afterward. You will also need to review the dangers and safety around hot water.

Strategies to Collect Evidence:
For collection of evidence, be sure that each student records data individually. Provide pictures, choice board or augmentative communication system to allow students to respond to questions, have an adult record responses.

Specific Options for Differentiating this Activity:
-Conduct the experiment on a surface that can be accessed by all students.
-Only do one rock type at a time and try other experiments to reinforce that type of rock before moving on.
-Allow students to use their preferred "pencil" when writing. This may include a writing utensil, keyboard, alternative pencil, or dictating to a scribe.
- Allow students to draw a picture as part of their observation of the rocks they create. They can write about it at a later time.
-Prepare, as necessary, for each student to make choices and communicate with their preferred method. This may include using augmentative communication.