Science K-2:

Rock Sorting

Intended Audience: Students with significant cognitive disabilities

# **Standards:**

SC.K.P.8.1 Sort objects by observable properties, such as size, shape, color, temperature (hot or cold), weight (heavy or light) and texture.

SC.K.N.1.4 Observe and create a visual representation of an object which includes its major features.

SC.1.E.6.1 Recognize that water, rocks, soil, and living organisms are found on Earth’s surface.

SC.1.P.8.1 Sort objects by observable properties, such as size, shape, color, temperature (hot or cold), weight (heavy or light), texture, and whether objects sink or float.

SC.1.N.1.4 Ask “how do you know?” in appropriate situations.

SC.2.E.6.1 Recognize that Earth is made up of rocks. Rocks come in many sizes and shapes.

# **Learning Objectives:**

1. Students will sort rocks into three categories: igneous, sedimentary, and metamorphic.

2. Students will describe the characteristics of rocks using the rocks’ observable properties.

3. Students will sequence changes in the rock cycle.

# **Vocabulary:**

1. weight: a measurement that indicates how heavy or light a thing is

2. Igneous rock: a rock that is formed when hot, liquid rock cools and becomes hard

3. Metamorphic rock: a rock that has been changed by extreme heat or pressure

4. Sedimentary rock: a rock with layers make from sediment or particles that often contain fossils

5. texture: the way something feels when you touch it

6. sediment: material that sinks to the bottom of a liquid (i.e. the ocean, a lake or a pond)

7. magma: hot, melted rock deep within a volcano

8. lava: magma that erupts from a volcano

9. metamorphosis: a change in the appearance or characteristics of something

# Materials:

* Samples of three rock types: Igneous, sedimentary, and metamorphic
* [The Rock Cycle](https://www.ducksters.com/science/rocks.php)
* Prepare ahead of time: images of rocks to be sequenced in the rock cycle (enough for multiple groups or individual work)
* [Types of Rock Video (cartoon)](https://kidsloverocks.com/types-of-rock/)
* [Readworks.org article: Earth Rocks!](https://www.readworks.org/article/Earth-Rocks!/ac41dee6-8594-468c-83d5-7069ff209abe#!questionsetsSection:1507/articleTab:vocabulary/vocabularySection:volcano/)
* Prepare ahead of time: graphic organizer(s) to assist with sorting rocks into different categories (i.e. shape, color, size, texture)
* Science journals

# **Essential/Guiding Questions:**

1. What are the similarities and differences between the three major types of rocks?

2. What characteristics can you observe that help you identify a rock type?

3. How do rocks change during the rock cycle?

# Lesson Presentation:

**Activating Prior Knowledge:**

1. Ask each student for a word that describes a rock. Words may be expressed verbally or with picture supports (turn and talk) or written in a journal (stop and jot).

2. Make a list of students’ descriptive words on the board/Smartboard. Tell them that they will use these words later, along with other descriptors to tell about 3 major types of rocks and the rock cycle.

**Modeled instruction:**

1. Tell students that they are going to learn more about different types of rocks. As an introduction, watch the short video: [Types of Rock Video (cartoon)](https://kidsloverocks.com/types-of-rock/) .

2. After the video, place the 3 different rock types (igneous, sedimentary and metamorphic) in front of students. Show them the igneous rock. Ask students what they see, then turn and talk to a partner. Repeat for the sedimentary and metamorphic rocks with options to share out/choral respond, stop and jot, write a response on a white board, or continue with turn and talk.

3. On the Smartboard or using a document camera, read the [Readworks.org article: Earth Rocks!](https://www.readworks.org/article/Earth-Rocks!/ac41dee6-8594-468c-83d5-7069ff209abe#!questionsetsSection:1507/articleTab:vocabulary/vocabularySection:volcano/) As you read the article, pause after each rock type is described, giving students an opportunity to experience how each rock feels.

4. Introduce the visual of the rock cycle from the online article, [The Rock Cycle](https://www.ducksters.com/science/rocks.php). Explain that igneous, sedimentary and metamorphic rocks are all connected and need the qualities of the others to change in size, shape, texture, etc. Use rocks/classroom materials to recreate the rock cycle.

**Supported/Guided instruction:**

1. On the Smartboard or using a document camera, re-read the [Readworks.org article: Earth Rocks!](https://www.readworks.org/article/Earth-Rocks!/ac41dee6-8594-468c-83d5-7069ff209abe#!questionsetsSection:1507/articleTab:vocabulary/vocabularySection:volcano/) As you re-read the article, circle the main idea/topic and underline the key details that relate to each of the rocks’ characteristics. If appropriate, give students a copy of the article so they may identify main idea/topic and key details. Use different colored markers/crayons/colored pencils.

2. Divide students into small groups of 3-4 students. Give each group of students a variety of rocks. Have them categorize rocks in multiple ways (i.e. color, size, shape, texture). Provide adult support as needed.

3. Revisit the image of the rock cycle. Divide students in to small groups to work collaboratively, giving each group visuals of the rock cycle to sequence.

**Independent Work:**

1. Given a group of rocks, students will sort them in at least one way.

2. Students will sequence the rock cycle using pictures, photos, or by writing in their science journals.

**Small group suggestions:**

1. Students can work collaboratively to sort and/or categorize rocks by shape, size or type.

2. Students can read an informational text found on ReadWorks.org: [Earth Rocks!](https://www.readworks.org/article/Earth-Rocks!/ac41dee6-8594-468c-83d5-7069ff209abe#!questionsetsSection:1507/vocabularySection:volcano/articleTab:content/) and show what they know. (Running record/lexile level should match text.)

3. Students can match pictures/photos of rocks.

4. Students can jot about the 3 major rock types in Science journals.

# Assessment:

1. Students will use a graphic organizer to sort pictures, photos or real objects/rocks into categories based on physical attributes.

2. Teachers should utilize district created rubrics to score student work.

# UDL:

**Multiple means of representation:**

1. Students can use a graphic organizer to show similarities and differences between different rock types.

2. Students can draw a Venn diagram and complete it to show similarities and differences between 2 different rock types.

3. Students can write a song about the three types of rocks.

4. Students can write journal entries about similarities and differences.

5. Students can draw pictures to show similarities and differences.

6. Students can work individually, in pairs, or in a small group.

7. Students can work independently with peer or adult supports.

**Multiple means of expression:**

1. Students can use an iPad or other touch device to show similarities and differences.

2. Text to speech options are available for computers, iPads and other hand held devices. Google Chrome offers free extensions, such as Selection Reader and Select and Speak-Text to Speech, and apps, such as Text to Speech, Text to Speech with Google Drive, and TTS Reader- Unlimited Text-to-Speech.

3. Speech to text options are also available from Google. Extensions include Voice Note II-Speech to Text, Online speech recognition, and Co: Writer Universal. Voice Note II is also available as an app; Speech notes-Speech to Text Notepad is available as well.

4. Additional information about text to speech and speech to text options are available through your district Assistive Technology Department.

5. Expression may come in the form of verbal responses, signed responses, pointing/gestures, eye gaze, or through the use of a low or high tech device.

6. All students should have access to expressive language/technology that is appropriate for their specific need.

**Multiple means of engagement:**

1. Provide students with choices of how to interact with materials.

2. Provide students or small groups with various places in the classroom in which to work, i.e. floor, desks, at the board.

3. Limit distractions in the work areas.

4. Encourage collaboration with peers in partners or small groups.

5. Allow students to work independently.

6. Allow students to be positioned for maximum learning engagement.

7. Provide students with additional materials, if necessary.

8. Provide supervision to students who need assistance when handling hard, and potentially dangerous, objects.

# Assistive Technology Recommendations:

1. All students should have a means of expressive communication and a way to be actively engaged in learning.

2. Response modes may include, but are not limited to: eye gaze, gesturing or pointing to pictures/words/phrases, signing, low tech devices (Go Talks, etc.), or dynamic devices (iPad, etc.)

3. Lesson vocabulary, photos/pictures and graphic representations should be created and/or printed prior to the lesson to provide all students with an opportunity to be engaged in discussion.

# Technology Needed:

* Smartboard
* Document camera

# Additional Resources:

* Igneous rock visual: [Igneous rock](http://www.sciencekids.co.nz/pictures/earth/igneousrock.html)
* Sedimentary rock visual: [Sedimentary rock](http://www.sciencekids.co.nz/pictures/earth/sedimentaryrock.html)
* Metamorphic rock visual: [Metamorphic rock](http://www.sciencekids.co.nz/pictures/earth/metamorphicrock.html)
* [Types of Rocks- Science Video for Kids](https://www.youtube.com/watch?v=tVy3dzLSMLg)
* Milo and the Magical Stones by Marcus Pfister- a Choose-Your-Own-Ending story
* [Milo and the Magical Stones video read aloud](https://www.youtube.com/watch?v=8hmScaj_fCM)

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