Science 3-5: Erosion

Intended Audience: Students with significant cognitive disabilities

# **Standards:**

SC.3.N.1.1 Raise questions about the natural world, investigate them individually and in teams through free exploration with systematic investigations, and generate appropriate explanations based on those explorations.

SC.3.N.1.6 Infer based on observation.

SC.4.E.6.4 Describe the basic differences between physical weathering (breaking down of rock by wind, water, ice, temperature changes and plants) and erosion (movement of rock by gravity, wind, water and ice).

SC.4.N.1.1 Raise questions about the natural world, investigate them individually and in teams through free exploration with systematic investigations, and generate appropriate explanations based on those explorations.

SC.4.N.1.6 Keep records that describe observations made, carefully distinguishing actually observations from ideas and inferences about the observations.

SC.5.E.7.4 Distinguish among the various forms of precipitation (rain, snow, sleet, and hail), making connections to the weather in a particular place and time.

SC.5.N.1.6 Recognize and explain the difference between personal opinion/interpretation and verified observation.

# **Learning Objectives:**

1. Students will investigate how water causes erosion.
2. Students will compare findings of erosion investigation.
3. Students will draw conclusions about the affect of water in the erosion process.

# **Vocabulary:**

1. erode: to wear away by water, wind or ice
2. erosion: the process of wearing away by water, wind or ice

**Materials:**

* Video: [Fun Science demos: Erosion and Soil](https://www.youtube.com/watch?v=im4HVXMGI68)
* Gather prior to instruction for investigation: large pitcher, water to fill pitcher 3 times, 3 empty 2 liter bottles (cleaned), 3 small plastic bottle bottoms (see video for size), soil, dried leaves, a plant or patch of grass, 3 pieces of string approx. 16” in length
* Prepare prior to instruction: materials needed for investigation
* Prepare prior to instruction: visual supports for academic content and vocabulary
* Prior to instruction: watch video from 01:38- 6:20 for investigation procedures.
* Science journals

# **Essential/Guiding Questions:**

1. Does water have the power to change land/soil?
2. How does water change land/soil that contains leaves or grass/plants?
3. How does water erode land/soil?
4. Does the quantity of water/rain affect the amount of erosion?

**Lesson Presentation:**

**Activating Prior Knowledge:**

1. Show students images of land erosion: [Land Erosion Before and After Images](https://www.google.com/search?q=land+erosion+before+and+after+pictures&rlz=1C1GCEB_enUS848US848&tbm=isch&source=iu&ictx=1&fir=emyAULWltE_61M%253A%252C8KtZ31ZxkTNvNM%252C_&vet=1&usg=AI4_-kR4goRL7Ltb1TkLtg2GccPn-ZcMyw&sa=X&ved=2ahUKEwi5jJyxi-fiAhVlhOAKHfeQCg8Q9QEwAHoECAQQBA#imgrc=UqpiWxHQ1wH3IM:&vet=1).

2. Students share out or capture thoughts in science journals.

3. Tell students that they are going to learn how water and rain can impact land/soil.

**Modeled instruction:**

1. Introduce the vocabulary erode and erosion. Use visual supports to for understanding.

2. Show students the video [Fun Science demos: Erosion and Soil](https://www.youtube.com/watch?v=im4HVXMGI68) from 00:00- 1:37.

3. Tell students that they are going to investigate how erosion impacts the natural world.

**Supported/Guided instruction:**

1. Review erosion images and vocabulary.

2. Show students materials needed for investigation.

3. Complete the investigation as shown in the video (01:38- 6:20). Investigation may be completed in whole group or in small groups, with support as needed.

**Independent Work:**

1. Students will show what they have learned from their observations and draw conclusions.

2. Pose the questions: What would happen if the water continued to pour into each of the containers? How does this compare to the rainy season in Florida? (Would there be more erosion?)

3. In science journals, students will draw images, write words or sentences to capture their conclusions.

**Small Group Suggestions:**

1. To reinforce reading comprehension, students can read [Weathering and Erosion](https://www.readworks.org/article/Weathering-and-Erosion/766786c1-2b0c-4b35-b630-a7b2b16b6a8b#!articleTab:content/) with support and identify main idea and key details.

2. Students can point to pictures that show erosion.

**Assessment:**

1. Students will make inferences based on observations of the three containers.
2. Students will answer the question: What if the water (rain) continues to pour?
3. Teachers should utilize district created rubrics to score student work.

**UDL:**

**Multiple means of representation:**

1. Students can show their knowledge with gestures.

2. Students can recreate the investigation with different materials.

3. Students can make connections to other types of erosion.

4. Students can draw pictures in science journals.

5. Students can write sentences or use pre-created sentence strips in journals.

6. Students can show what they’ve learned by generalizing knowledge to something in their own environment (i.e. erosion on the school campus, an image of beach erosion).

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

**Multiple means of expression:**

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

2. 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.

3. Text to speech options are available for computers on the Word app, 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.

4. 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. Microsoft Word also has speech to text options.

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

**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 when working with plants, flowers and dirt.

**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 (GoTalks, 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.

4. When possible, provide students with text to speech options. Articles and passages from Readworks.org have this option.

5. If students are writing in response to text or writing as a means of sharing information, provide students with alternates to pencils. Speech to text and alternative pencils should be considered. Find more information about alternative pencils here: [Alternative Pencils](http://alternativepencils.weebly.com/)

**Technology Needed:**

* Smartboard to show video

**Additional Resources:**

* Video: [Bill Nye the Science Guy: Erosion](https://www.youtube.com/watch?v=J-ULcVdeqgE)
* From betterlessons.com: [Using Skittles to Learn About Erosion](https://betterlesson.com/lesson/637182/using-skittles-to-learn-about-weathering-and-erosion)
* From brainpop.com: [Erosion: article, activities](https://educators.brainpop.com/bp-topic/erosion/)
* From readworks.org: [Weathering and Erosion](https://www.readworks.org/article/Weathering-and-Erosion/766786c1-2b0c-4b35-b630-a7b2b16b6a8b#!articleTab:content/)
* District-provided science materials