

Grade 3 – 5: Science

Erosion

This resource can be used to plan an individual Science lesson or a unit of study. The suggested activities can be used in the order presented here, or they can be adapted for your lesson plan and classroom.

CURRICULUM OBJECTIVES

VIDEO OUTCOMES

Science / Earth's Systems: Processes that Shape the Earth

Make observations to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

TEACHER PACK OUTCOMES

Science / Earth's Systems: Processes that Shape the Earth

Make observations to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Science / Science and Engineering Practices

Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.

Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.

Obtain and combine information from books and other reliable media to explain phenomena.

DISCLAIMER

The activities included in this Teacher Pack have been adapted from those listed in the *Weathering* Miniclip.

Activity

Resources

Outcomes

Activity 1: How Were They Made?

Timeframe: 40 minutes

Lesson overview: Students will be introduced to the processes of erosion by examining various natural landforms that have been shaped by erosion and weathering.

Open the *How Were They Made?* PowerPoint presentation and go through each slide together as a class.

Discuss what students see on each slide. Questions to guide the discussion can include:

- Do you recognize this landform? If so, what is it called and where is it located?
- What is unique or interesting about this landform?
- How do you think it was created?
- What natural forces do you think carved it out?

Once you have gone through all the slides, introduce erosion. Explain how this process has created the natural landforms.

Watch the ClickView Miniclip *Erosion*. After watching the video, reopen the *How Were They Made?* PowerPoint presentation on the board and discuss how the process of erosion and weather has carved out the landform.

Distribute a copy of the *Define the Process* worksheet to each student. Students are to fill in the definition for each natural process. Students can also record any new additional information they have learned in their notebooks.

Smartboard / Digital display

ClickView Miniclip – *Erosion*

How Were They Made? PowerPoint presentation

Define the Process worksheet

Writing materials

Notebooks

Students will:

- Make observations to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Activity

Resources

Outcomes

Activity 2: Bringing Erosion Into the Classroom

Timeframe: 30 minutes

Lesson overview: Students will see how erosion and weathering occurs by conducting an experiment using sand and dirt to observe how water changes the landscape.

Before the lesson: Organize the materials required to conduct this activity. Prepare your workstation and ensure you have waterproofed it appropriately.

This activity can be done as a whole class or in student groups. If you choose to conduct it in student groups, set up each workstation with the appropriate materials.

Rewatch the ClickView Miniclip *Erosion* with your class.

After viewing, discuss how the process of erosion affects the landscape.

Ask students to gather around your workstation. If this activity is being done in student groups, have them gather around their own workstation.

Follow the steps provided in the *Bringing Erosion and Weathering Into the Classroom Instructions*.

As you demonstrate the effects of erosion and weathering, encourage students to discuss their observations, thoughts and questions.

After conducting the experiment once, change the landscape (or encourage students to change their landscapes) and repeat the steps to see how erosion and weathering can occur differently.

Students are to discuss the questions outlined in the *Bringing Erosion and Weathering Into the Classroom Instructions* and write a short reflection about erosion and weathering.

Smartboard / Digital display

ClickView Miniclip – *Erosion*

Cleared and waterproofed workstation

Bringing Erosion and Weathering Into the Classroom Instructions

Materials outlined in the instructions

Students will:

- Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.
- Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.

Activity	Resources	Outcomes
<p>Activity 3: Holding It All Together Timeframe: 2 hours (preparation time) + 45 minutes Lesson overview: Students will learn about the importance of root systems in preserving soil and preventing erosion and weathering through an experiment.</p> <div> <p>Before the lesson: Plant seedlings in the third plastic bottle or buy a ready-grown plant and transfer it over to one of the bottles. Ensure that whichever option you choose, the plant has an established root system to hold the soil together.</p> <p>You will also need to organize the bottles and set up the activity. This experiment can either be teacher-led with one setup, or student-led with multiple setups.</p> </div> <p>In this experiment, three plastic bottles will have three different soil setups (1 x soil only, 1 x soil and mulch, 1 x soil and plant with an established root system).</p> <p>Pour water into each bottle, which will filter through each soil composition and collect into a small runoff container hanging under the mouth of each bottle. These runoff containers will be filled with the soil and/or water from each bottle at the end of the experiment.</p> <p>You will find that the first container (soil only) will have the dirtiest water with the most particles, while the second container (soil and mulch) will have slightly cleaner water, and the third container (plant with root system) will have the cleanest water with almost no particles. This shows that root systems help to keep soil together and prevents it from being washed away, therefore preventing erosion and weathering, and maintaining a sturdy environment.</p> <p>At the end of this activity, distribute a copy of the <i>Holding It All Together</i> worksheet to each student. They are to illustrate the final results and write an explanation for each bottle's runoff.</p>	<p><i>Holding It All Together Experiment</i></p> <p>3 x large plastic bottles (for soil containers)</p> <p>3 x plastic bottle bases (for capturing runoff)</p> <p>Scissors</p> <p>String</p> <p>Water</p> <p>Soil</p> <p>Mulch</p> <p>Plant with existing root system</p> <p>Optional: Hot glue gun</p> <p>Piece of plywood</p>	<p>Students will:</p> <ul style="list-style-type: none"> • Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system. • Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.

Activity

Resources

Outcomes

Activity 4: Online Erosion Games

Timeframe: Variable duration

Lesson overview: Students will develop their understanding of erosion and weathering by playing a range of online games.

Students can develop their understanding of erosion and weathering through a variety of online games listed below.

Hyperlinked game	URL
<u>Weather Buster</u> Duration: 10 minutes Players use their slingshot to hit the flying objects that will cross the screen. Some of the objects that you hit will provide you with facts. You will see other objects that will give you questions to answer that will boost your score. As the levels advance, the objects will move more quickly!	https://games.legendsoflearning.com/games/WyJnYW1lcylsODE2XQ==
<u>Walter's Travels: Weathering and Erosion</u> Duration: 10 minutes Meet Walter, a friendly animal who will guide you on your quest for knowledge about erosion and weathering. Begin your journey by doing different activities to that will simulate weathering and erosion. The game continues with a variety of activities and information.	https://games.legendsoflearning.com/games/WyJnYW1lcylsMTE5M10=
<u>Erosion Frenzy</u> Duration: 9 minutes This game starts with a tutorial about weathering and erosion. Players have to unlock the levels to complete the game. Move the cat around the screen to collect items related to erosion and collect as many items you can to pass each level and earn points. As you collect items, you can also collect facts and questions to earn more points.	https://games.legendsoflearning.com/games/WyJnYW1lcylsODMwXQ==
<u>Art of Destruction</u> Duration: 14 minutes Breaking down rocks is hard work! This game will have you simulate many of the natural processes that lead to weathering and erosion. You'll get to be water and wind - stronger than rock or buildings! You'll be racing for a high score as you learn about these important processes on Earth.	https://games.legendsoflearning.com/games/WyJnYW1lcylsMTM0MF0=

1:1 devices with Internet connection

Access to the games listed or of your own choosing

Students will:

- Obtain and combine information from books and other reliable media to explain phenomena.

Activity**Resources****Outcomes****Memoria: Weathering and Erosion****Duration:** 6 minutes

This game is a geologically themed memory matching game. You will try to find matching pairs in a group of cards. After each match that you make in the game, you are given a different fact about the geological process of erosion and weathering. In between levels, you can use some of the points that you gathered to purchase power-ups for the next level.

<https://games.legendsoflearning.com/games/WyJnYW1lcylsMTlwMV0=>

Master the Elements**Duration:** 7 minutes

It's player versus a rock monster. All you need to do is keep the rock monster happy. How? You need to try your best to answer questions about erosion correctly. You will earn points for each question you answer correctly, and you need to earn points to make it to the next level! Try to answer the questions correctly or the rock monster will not be pleased.

<https://games.legendsoflearning.com/games/WyJnYW1lcylsNDY0XQ==>

Activity

Resources

Outcomes

Activity 5: Additional Resources

Timeframe: N/A

Lesson overview: Students can use these videos to learn more about the natural process of erosion and weathering, and their impact on the environment.

Students can develop their understanding of erosion and weathering through the following videos available on ClickView.


Hyperlinked video	URL
<u>Weathering</u> (Series - Miniclips: Earth's Changing Surface) Duration: 5 minutes Some of Earth's magnificent landforms are caused by weathering and erosion. But what is weathering and how does it create magnificent structures on our planet? This Miniclip explains the process of weathering including the two main types: mechanical and chemical. Students will learn the different natural impacts on this process such as water, temperature change, wind, oxidation, and more.	https://online.clickview.us/videos/39382772
<u>Extreme Weather</u> (Series - Miniclips: Earth's Changing Surface) Duration: 6 minutes Heat waves, hurricanes, droughts, tornadoes, hailstorms, floods, and severe thunderstorms. These are all examples of extreme weather that shape our landscape. But what exactly are they and how do they happen? This Miniclip explores each of these extreme weather types and examines the natural and human influences that cause them including climate change, the Earth's atmosphere, ocean currents and more.	https://online.clickview.us/videos/39430033
<u>Discovering Rocks and Soil</u> (Series: Miniclips) Duration: 4 minutes What is soil? How is it formed? And what do rocks have to do with it? Natural processes change the Earth's surface, including rocks and soil! This Miniclip explains the processes that rocks undergo and links them to the creation of soil. It describes the different characteristics of soil, how animals and plants contribute to this fertile resource, and introduces the concepts of weathering and erosion.	https://online.clickview.us/videos/39386315

Devices with Internet connection (either Smartboard / Digital display or 1:1 devices)

Access to ClickView

Students will:

- Obtain and combine information from books and other reliable media to explain phenomena.

Activity	Resources	Outcomes
<p><u>Activity 6: Interactive Video</u> Timeframe: 15 minutes Lesson overview: Students will watch the ClickView Miniclip and answer the interactive questions to show their understanding of erosion.</p> <hr/> <p>ClickView has created an interactive video lesson to accompany the ClickView Miniclip <i>Erosion</i>. It includes a range of question types such as multiple choice, missing word, and true or false.</p> <p>You can assign the interactive video to your students to do at any suitable point in your unit. Alternatively, you can edit the premade questions to suit your students or create your own interactive video.</p> <p>To share the interactive video with your students, follow these steps:</p> <ol style="list-style-type: none"> 1. Search for the Miniclip <i>Erosion</i> that has the interactive logo (). 2. Click to view the video. 3. Click on the "Interactive videos" tab beneath the video. 4. Click the "Print as Worksheet" OR "Save to Workspace" button on the interactive video. 5. If you click "Save to Workspace", you can either click "Share with your students" or access it via your Workspace. <ul style="list-style-type: none"> • If you choose "Share with your students", copy the link and send it to your students. • Otherwise go to your Workspace, select the "Interactive videos" folder, and click "Share" to access the link and send to students. <p>Students can watch and answer the interactive questions either in class or at home. Their results will be collated for you to view from your Workspace.</p> <p>The following guides are available if you require assistance:</p> <p>Creating an interactive video How do I share an interactive video? How do I make my interactive video private/public?</p>	<p>Interactive video for the ClickView Miniclip – <i>Erosion</i></p> <p>1:1 devices with Internet connection</p>	<p>Students will:</p> <ul style="list-style-type: none"> • Make observations to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.