Science and technology – learning sequence

## Resource considerations

This lesson sequence allows for continuity of student learning and could be adapted to fit in with your existing teaching and learning program. Students will be supported to meet outcomes from a Key Learning Area. Each task has a duration of 30 minutes and could be used in conjunction with your [framework, designed using the K-6 template](https://education.nsw.gov.au/teaching-and-learning/curriculum/learning-from-home/teaching-and-learning-resources/k-6-resources). This lesson sequence uses a balance of synchronous and asynchronous learning strategies. The tasks provide options for students with and without technology. They can be used with any online platform. Suggestions about how your school will plan students’ learning from home and ways to communicate with students can be found through the [Learning at home, school planning page.](https://education.nsw.gov.au/teaching-and-learning/curriculum/learning-from-home/school-planning) Assessment strategies are included to ensure evidence of learning is monitored and collected.

## Stage 2 learning sequence

### Strand: Earth and space

**Outcomes**

**ST2-1WS-S – questions, plans and conducts scientific investigations, collects and summarises data using scientific representations**

**ST2-2DP-T** – select and use materials, tools and equipment to develop solutions for a need or opportunity

**ST2-10ES-S – investigates regular changes caused by interactions between the Earth and the Sun, and changes to the Earth’s surface**

**Learning sequence overview** – students investigate some natural processes and human activities that cause erosion.

**Key concepts** – Earth science, erosion

**Key language** – Weathering, erosion, compacting, scientific diagram, labelled diagram, field study, design process

**Key inquiry question – How do natural processes and human actions change the Earth’s surface over time?**

### Aim of lesson sequence

* Students learn about weathering and erosion and investigate some human activities that cause erosion over time.

### Teacher notes

Erosion and weathering are processes that form part of the rock cycle. In this sequence, students will work scientifically by conducting a field study and an investigation to demonstrate erosion. They will use the design process to develop a solution to mitigate erosion at home.

You will need to print hard copies of the [images of weathering and erosion](http://scienceweb.asta.edu.au/years-3-4/unit3/lesson-three/yr34-unit3-lesson-three.html) to send home for students who are working in a non-digital environment.

Activities

1. **How erosion changes the Earth’s surface**
   1. **Digital:**

* Show students some [images of weathering and erosion](http://scienceweb.asta.edu.au/years-3-4/unit3/lesson-three/yr34-unit3-lesson-three.html) and discuss how wind, rain, ocean waves and ice cause weathering and erosion over time.
* Ask students to think about some examples of weathering and erosion that they have seen or know about. Share student ideas with the class. These may include stories about beach erosion from student’s holidays or erosion at the farm.
* Explain that scientists conduct field studies and surveys to collect information and data from selected places. Direct students to conduct a field study by recording where erosion has happened at home or in the local neighbourhood. Draw and label a diagram to show one of these places.
* Conduct a first-hand investigation to demonstrate [beach erosion](https://littlebinsforlittlehands.com/coastal-erosion/). Ask students to write a prediction about their beach erosion investigation before they do it. Once the investigation has been completed, ask students to record their observations and results.
  1. **Non-digital:**
* Provide some images of weathering and erosion and ask students to identify the cause of erosion for each image. For example, wind, rain or ice.
* Ask students to think about some examples of weathering and erosion that they have seen or know about. These may include stories about beach erosion from student’s holidays. Ask students to create a list of examples from their own life experience.
* Explain that scientists conduct field studies and surveys to collect information and data from selected places. Direct students to conduct a field study by recording where erosion has happened at home or in the local neighbourhood. Draw and label a diagram to show one of these places.
* Conduct a first-hand investigation to demonstrate beach erosion. Ask students to write a prediction about their beach erosion investigation before they do it. Once the investigation has been completed, ask students to record their observations and results.

1. **Preventing erosion.**
   1. **Digital:**

* Thinking about a place at school or home, from student’s field study, where erosion has been caused by human activity, follow a design process to create a solution that could help reduce or prevent the erosion from happening.
  + Identify the problem by describing the erosion issue at home or school.
  + Look at some pictures that show how erosion has been prevented at the [beach](https://www.walkingsa.org.au/news/path-forward-hallett-cove-boardwalk/) or in a [rainforest](https://envorinex.com/track-matting).
  + Brainstorm ideas for how students could reduce or prevent erosion happening at school or home.
  + Ask students to design their solution. Students should discuss their design with an adult for feedback.
  + Construct a model using natural materials like cardboard, paddle pop sticks, paper cups, playdough, sticks, tree bark and wool or hemp string.
  + Test model to see if it could reduce or prevent erosion.
  1. **Non-digital:**
* Thinking about a place at school or home, from student’s field study, where erosion has been caused by human activity, follow a design process to create a solution that could help reduce or prevent the erosion from happening.
  + Identify the problem by describing the erosion issue at home or school.
  + Look at some pictures that show how erosion is prevented at the beach or in a rainforest.
  + Brainstorm ideas for how students could reduce or prevent erosion happening at school or home.
  + Ask students to design their solution. Students should discuss their design with an adult for feedback.
  + Construct a model using natural materials like cardboard, paddle pop sticks, paper cups, playdough, sticks, tree bark and wool or hemp string.
  + Test model to see if it could reduce or prevent erosion.

### Differentiation

Differentiation is a targeted process recognising that individuals learn at different rates and in different ways. Differentiation refers to deliberate adjustments to meet the specific learning needs of all students.

Here are some questions that you might consider when adapting the learning sequence to meet the needs of your students:

* What adjustments might you put in place for students who require additional support to access the task? For example, how will they get help when needed?
* Do you need to adjust the content to ensure it is adequately challenging and allows students to operate at their own level of thinking, skill and knowledge?
* Will you adapt the instructions so they are provided in a way that EAL/D students can easily interpret them? For example, through the use of visuals, checklists, diagrams or flow charts.
* Could you suggest ways that home language can be used as a tool to support learning? For example, bilingual dictionaries.
* Can you demonstrate that you value the Identity, culture, heritage and language of your Aboriginal students through your teaching practices?

### Assessment

Students demonstrate their understanding by using correct vocabulary in explanations and when giving reasons for choices.

Students correctly identify causes of erosion.

Students correctly identify examples of weathering and erosion at school or at home.

Students make a prediction about erosion and then test this by conducting a first-hand investigation.

Students design and produce a prototype solution that helps to prevent or reduce erosion happening at a place at school or home.

### Activity resources

[Images of weathering and erosion](http://scienceweb.asta.edu.au/years-3-4/unit3/lesson-three/yr34-unit3-lesson-three.html)

[Instructions for beach erosion demonstration](https://littlebinsforlittlehands.com/coastal-erosion/)

[Image showing prevention of erosion at a beach](https://envorinex.com/track-matting)

[Image showing prevention of erosion in a rainforest](https://envorinex.com/track-matting)

Materials required for the beach erosion investigation are:

* water tray
* Sand or dirt
* Pebbles
* blue food colour (optional)
* empty plastic bottle or a cup.