



Science Grade 4 • Semester B

Project Guide

Overview

This course has two project assignments. The first project, *Shaping the Surface of the Earth*, is in Unit 4 (Lessons 16–20). The second project, *Earth's Impacts on Humans*, is in Unit 5 (Lessons 21–25).

Both projects require students to use critical thinking skills to identify a problem, conduct an experiment, and analyze the results.

Project 1: Shaping the Surface of the Earth

Project Description

In this project, students will focus on using the scientific method to investigate the ability of two sand castles—one made with sand alone and one made with sand and additional sediments—to stay standing after being exposed to natural abiotic factors. Each lesson introduces a new step in the scientific method. Students will create a testable question to solve a problem about the weathering, erosion, and deposition of the sandcastles.

Project Objectives

- Explain the impacts of weathering, erosion, and deposition of soil, rock, or sediment on Earth's surface materials.
- Explain how the interactions between Earth's major systems affect the processes of weathering and erosion.
- Plan fair tests in which variables are controlled and failure points are considered.
- Conduct fair tests in which variables are controlled and failure points are considered.
- Communicate the optimized solution by presenting it to others.
- Make observations about the world through scientific investigations.
- Communicate the details of scientific investigations clearly and thoroughly.

Project at a Glance

Lesson	Project Step
Unit 4 – Lesson 16	Step 1: Plan an Investigation About Weathering
Unit 4 – Lesson 17	Step 2: Plan an Investigation About Erosion
Unit 4 – Lesson 18	Step 3: Investigate How Deposition Can Be Observed
Unit 4 – Lesson 19	Step 4: Investigate How Weathering, Erosion, and Deposition Affect Rocks
Unit 4 – Lesson 20	Step 5: Explain How Earth Processes Work Together (Submission)

Project Steps

Step 1 – Lesson 16: Plan an Investigation About Weathering	Students will begin the project by making observations about two sandcastles and identifying a problem. They will add a problem statement to their Scientific Process organizer.
Step 2 – Lesson 17: Plan an Investigation About Erosion	Students will use what they have learned about weathering, erosion, and deposition to formulate a hypothesis. They will add the hypothesis statement to their Scientific Process organizer.
Step 3 – Lesson 18: Investigate How Deposition Can Be Observed	Students will write the experimental procedure, conduct the experiment, and collect data. They will continue adding to their Scientific Process Organizer.
Step 4 – Lesson 19: Investigate How Weathering, Erosion, and Deposition Affect Rocks	Students will complete an analysis, reflecting on their experiment to determine whether the results supported their hypothesis.
Project Submission – Lesson 20: Explain How Earth Processes Work Together	Students will write a conclusion paragraph describing the results of the experiment. This step goes beyond restating data—students must explain what the data means. They will add their final thoughts and breakdown of the experiment and results.

Project 2: Earth's Impacts on Humans

Project Description

In this project, students will create a design that investigates water and Earth's natural processes to develop solutions to protect people against water impacts. Each lesson introduces a new step in the engineering design process, from defining the problem and brainstorming possible solutions to conducting tests and noting potential improvements. Students will record their information on an Engineering Design Process Organizer and submit it at the end of the unit.

Project Objectives

- Construct an evidence-based argument about the availability of water on Earth.
- Construct an evidence-based argument about how life is impacted by the availability of water.
- Identify problems related to the impacts of natural Earth processes on humans.
- Plan fair tests in which variables are controlled and failure points are considered.
- Conduct fair tests in which variables are controlled and failure points are considered.
- Communicate the optimized solution by presenting it to others.
- Make observations about the world through scientific investigations.
- Communicate the details of scientific investigations clearly and thoroughly.

Project at a Glance

Lesson	Project Step
Unit 5 – Lesson 21	Step 1: Construct an Argument about Earth's Water and Life
Unit 5 – Lesson 22	Step 2: Interpret Patterns in Weather Data
Unit 5 – Lesson 23	Step 3: Investigate Patterns in Climate Data
Unit 5 – Lesson 24	Step 4: Model Natural Disasters
Unit 5 – Lesson 25	Step 5: Explain the Importance of Conservation Choices (Submission)

Project Steps

Step 1 – Lesson 21: Construct an Argument about Earth's Water and Life	Students will begin an engineering design project to protect people against water impacts (hurricanes, cyclones, typhoons, tsunamis, flash floods). They will identify the problem and write a problem statement on their Designing Solutions for Water Impacts worksheet.
Step 2 – Lesson 22: Interpret Patterns in Weather Data	Students will collect and interpret weather data from their own area, record it in a chart, and analyze patterns. They will complete Step 2 of the Designing Solutions for Water Impacts worksheet.
Step 3 – Lesson 23: Investigate Patterns in Climate Data	Students will investigate patterns in climate data and brainstorm possible design solutions for the problem. They will complete Steps 3 and 4 of the worksheet.
Step 4 – Lesson 24: Model Natural Disasters	Students will create models of two natural disasters caused by seismic waves: an earthquake and a tsunami. They will complete Steps 4 and 5 of the worksheet.
Project Submission – Lesson 25: Explain the Importance of Conservation Choices	Students will evaluate the design they created, compare and contrast it with other engineering designs, and brainstorm modifications and improvements.