

Local Landforms Grade 3

Natural Features of the Earth's Surface



CLASSROOM BEGINNINGS LEARNING PACKAGE

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Introduction

The Local Landforms curriculum is a place-based look at landforms that aims to help young learners begin to understand the landforms around them, how they came to be, and how they change. Through the arts, students will make connections between landforms, erosion, and weathering and the everyday landscapes of their lives.

How to Use this Resource

The Local Landforms Curriculum Package has 3 Components:

Part 1. Classroom Beginnings: Recommended for use in the classroom prior to the Field Experience.

Part 2. The Local Landforms Field Experience Curriculum: A facilitated curricular experience.

Part 3. Classroom Culminations: Recommended for use in the classroom following the Field Experience.

Local Landforms Grade 3: Content & Curricular Competencies

Science	Students will learn about the following: Major local landforms Local First Peoples knowledge of local landforms Observable changes in the local environment caused by erosion and deposition, by wind, water, and ice	Questioning and Predicting Demonstrate curiosity about the natural world Observe objects and events in familiar contexts Planning and Conducting Make observations about living and non-living things in the local environment Sort and classify data and information using drawings
Arts Education	Students will learn about the following: Visual Arts: elements of design Processes, materials, technologies, tools, and techniques used to support art activities Choreographic devices	Exploring and Creating Choose elements processes, materials, movements, technologies, tools, techniques and environments of the arts Create artistic works collaboratively and as an individual using ideas inspired by imagination, inquiry, experimentation, and purposeful play Communicating and Documenting Apply learned skills, understandings, and processes in next contexts Experience, document, and share creative works

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About the Local Landforms Classroom Beginnings Learning Package

The Local Landforms Classroom Beginnings Learning Package will introduce basic landforms and concepts of erosion and deposition through the arts and scientific experimentation.

Lessons in this Resource

Lesson 1: Local Landforms Mini Dictionary

Lesson 2: Local Landforms Flipbook

Lesson 1: Landforms Mini Dictionary

Introduction

Through creative and engaging activities, your students will explore and learn about landforms. In this lesson, they will make their own mini dictionary of landforms. This dictionary can be added to as landform vocabulary increases.



Materials

- Pictures of the following landforms: mountains, hills, valleys, plateaus, and plains
- Landform map of BC <https://www.for.gov.bc.ca/hfp/publications/00131/FIG01.GIF>
- Landform map of Canada <https://sites.google.com/a/ocsb.ca/cgc-1d/a-unit-2-3-natural-disasters--earthquakes/3-landform-regions>
- Paper (at least 3 sheets per student)
- Notebooks
- Stapler

Procedure

Introduction (10 minutes)

1. Introduce the lesson by discussing with students interesting facts about the Earth. For example: One-fourth of the Earth's surface is covered by land. The land on the Earth is not the same everywhere. These different physical features found on the surface of the Earth are called landforms. Landforms can affect the weather, climate, and lifestyle of a community.
2. Develop a definition of landforms that includes some examples through discussion. Discussion should include the impact of landforms on a community. For example, landforms affect where people live and build their communities. Travel routes are often designed according to landforms such as mountains. Write down the definition your class develops where all students can see it. Have students write down the vocabulary word landform and the definition in their notebooks.

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Lesson 1: Landforms Mini Dictionary (continued)

Procedure (continued)

Explicit Instruction/Teacher Modeling (15 minutes)

Key Vocabulary: Mountain, Hill, Plateau, Plain

1. Display pictures of landforms, and label them on the board. Remind your students that mountains are the highest landform on Earth's surface, and they may be steep and covered with snow or have gentle slopes with a rounded top. Explain that a group of mountains is called a mountain range. Show your students a picture of hills, and explain that these are areas of raised land. Tell your students that plateaus are areas of high land that often have steep sides but are typically flat or hilly on top. Display an example of plains, informing them that these are large areas of flat land. Remind your students that valleys are low areas that lie between two mountains or hills, and they are often formed by rivers or glaciers.

Guided Practice/Interactive Modeling (15 minutes)

1. Display a geographic map of BC.
2. Locate and discuss any landforms that exist in BC.
3. Talk about the symbols used to represent hills, mountains, plateaus, or valleys on the map.
4. Demonstrate how a map has a legend, or a map key, that identifies the symbol and its meaning.
5. Extend the lesson by looking at a geographic map of Canada.
6. Locate and discuss various landforms.

Independent Working Time (20 minutes)

1. Hand out at least 3 pieces of paper to each student to make a mini dictionary of the terms from this lesson.
2. Instruct students to fold their papers in half to create a booklet. Have them staple them on the sides.
3. Ask your students to title the booklet "Landform Dictionary" or something similar.
4. Have your students create a page for each vocabulary word and write the definitions. Direct them to include a drawing with each landform.
5. Collect all mini dictionaries when completed.

Differentiation/Enrichment

Challenge your students to include additional landforms and map symbols in their dictionaries. Give students the opportunity to verbally define the landforms instead of writing them out in their booklets. Show them the pictures of the landforms again to help them differentiate between landforms such as mountains and hills. Give them other real-life examples, such as the Coast Mountains.

Assessment

Review students' work in their mini dictionaries. Provide feedback and assess their understanding of landforms. Work with students that did not display a clear understanding of the concepts in a small group.

Video Resource: Exploring Landforms and Bodies of Water

https://www.youtube.com/watch?v=BsqKTJtK_vw

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Lesson 2: Weathering and Erosion

Introduction

The Earth's land is always changing. Two processes that contribute to those changes are weathering and erosion. In this lesson, students will learn all about these processes, their differences and their affect the planet you call home.

Background

Weathering refers to the group of destructive forces that change the physical and chemical character of rock near the earth's surface. Mechanical weathering (or physical disintegration) is the breaking down of rocks into smaller pieces. The change in the rock is physical with little or no chemical change. Chemical weathering is the decomposition of rock from exposure to water and atmospheric gases (principally carbon dioxide, oxygen, and water vapor). As rock is decomposed by these agents, new chemical compounds form. Examples of mechanical weathering include: frost action, abrasion, and pressure release. Examples of chemical weathering include: rusting, acid breakdown, and solution weathering. **Erosion** is the picking up or physical removal of rock particles by an agent such as streams or glaciers. Weathering helps break down a solid rock into loose particles that are easily eroded. Most eroded rock particles are at least partially weathered, but rock can be eroded before it has weathered at all. A stream can erode weathered or unweathered rock fragments.

Objectives

As a result of this lesson students will be able to identify various types of weathering and erosion. They will also discover the effects that occur with each type of weathering and erosion.

Materials: This can be done as a series of stations.

<ul style="list-style-type: none">• Access to a freezer is needed, but it doesn't have to be in the room.• Internet access and a computer are needed.• carbonated water• overhead markers• ziplock bags• tap water• pennies• sugar cubes• baby food jars (6 per group)• gravel	<ul style="list-style-type: none">• vinegar• shallow pan• rock samples• antacid tablets• ice cubes• plastic glasses• mortar and pestle• sand• chalk• steel wool
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Part I Procedure: Introducing the Concepts (15 Minutes)

1. Introduction: Video Resource: <https://www.youtube.com/watch?v=R-lak3Wvh9c>
2. Recap some of the key concepts following the video:
 - a. Weathering: Destructive forces that change the physical and chemical features of a rock near the earth's surface.
 - b. Erosion: The movement of rock materials from one place to another.

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Special note: Part II & III can be performed as independent student-led stations or they can be taught as teacher-led experiments.

Part II Procedure: Weathering Labs (2, 60 Minute Sessions)

1. Introduce the types of weathering. Discuss the differences between the weathering. Showing pictures is helpful. Also showing pictures of each process and effect is helpful
2. Perform weathering lab either as independent, student-led activities or as teacher-led instructional experiments.
3. One station for each lab. Lab sheets for each station are attached at the end of the lesson.
 - i. Test rock samples in carbonated water vs. tap water. Observations are taken initially, at 20 minutes, and after 24 hours.
 - ii. Test to show that water expands as it freezes. Mark on a cup the water level before freezing and after freezing. Station
 - iii. Test the effects of vinegar (acid rain) on copper (pennies). Here you should record observations initially and then after 5 minutes.
 - iv. Compare and record the reaction of antacid tablets in water. The comparison is a whole tablet vs. crushed tablet.
 - v. Compare and record the reactions of chalk (limestone) in water and vinegar.
 - vi. Test and record the effect of water on steel wool.
 - vii. Test and record the effects of sugar cubes and gravel shaken together in a jar.
4. Discuss lab and effects of each process.

Discussion Questions

- How does weathering and erosion occur?
- What is the result of each type of weathering?
- Where on earth or in BC does this happen?

Part III Procedure: Erosion Stations (2, 60 Minute Sessions)

1. Introduce types of erosion. Discuss the differences between erosion and weathering. Showing pictures is helpful. Also showing pictures of each process and effect is helpful. [Web sites listed have pictures.]
2. Perform erosion labs either as independent, student-led stations or as teacher-led instructional experiments.
3. One station for each lab. Lab sheets for each station are attached at the end of the lesson.
 - i. Demonstrates beach erosion. Using a pan, make a sand pile at one end and pour water at the other end. Slide the pan back and forth to create wave movement. Record observations.
 - ii. Place an ice cube in a plastic cup of warm water. What is the effect? Record observations.
 - iii. Freeze ice cubes with sand in them and then move the sand ice cubes over different surfaces, sand, water, dirt, etc. Record observations.
 - iv. Place sand in a small bowl and the use a hair dryer to move the sand. Note if different speeds are possible. Record observations.
 - v. Place a pile of ice cubes on a mound of dirt. Observe and record what happens as it melts

Discussion Questions

- How does erosion occur?
- What is the result of each type of erosion?
- Where on earth or in BC does this happen?

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Weathering: Lab Sheet 1 Effects of Water on Rock

Name_____

Amount of water used _____

Types of Rocks_____

Observations

Water Type	After 20 Minutes	After 24 Hours
Tap Water		
Carbonated Water		

Conclusions_____

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Weathering: Lab Sheet 2

Effects of Freezing on Water

Name_____

Amount of water used _____

Size of Beaker_____

Observations

Water Level Before Freezing	After Freezing
Record level and mark outside of beaker	Record level

Conclusions

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Weathering: Lab Sheet 1 Effects of Water on Rock

Name_____

Amount of water used _____

Types of Rocks_____

Observations

Water Type	After 20 Minutes	After 24 Hours
Tap Water		
Carbonated Water		

Conclusions_____

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Weathering: Lab Sheet 3

Effects of Vinegar on Copper Pennies

Name _____

Amount of vinegar used _____

Observations

Type of Vinegar	Immediate Reaction	After 5 Minutes

Conclusions _____

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Weathering: Lab Sheet 4

Effects of Water on Antacid Tablets

Name_____

Amount of water used _____

Type of antacid tablets_____

Observations

Tablet Composition	Immediate Reaction	After 10 Minutes
Whole		
Crushed		

Conclusions_____

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Weathering: Lab Sheet 5

Effects of Water/Vinegar on Limestone

Name _____

Amount of water / vinegar used _____

Type of limestone (chalk; rock) _____

Observations

Solution	Immediate Reaction	After 10 Minutes
Water		
Vinegar		

Conclusions _____

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Weathering: Lab Sheet 6 Effects of Water on Steel Wool

Name_____

Amount of water used _____

Observations

Immediate Reaction	After 1 Hour	After 24 Hours

Conclusions_____

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Weathering: Lab Sheet 7

Effects of Gravel on Sugar Cubes

Name _____

Number of Sugar Cubes Used _____

Amount of Gravel Used _____

Observations

Reaction After 2 Minutes	Reaction After 5 Minutes	Reaction After 8 Minutes

Conclusions _____

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Erosion: Lab Sheet 1

Beach Erosion

Name_____

Amount of water used _____

Observations

	Water Only	Wave Action
Sand		

Conclusions_____

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Erosion: Lab Sheet 2

Ice Cube and Warm Water

Name_____

Amount of warm water used _____

Observations

Ice Cube Before Adding Warm Water	Ice Cube After Adding Warm Water

Conclusions_____

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Erosion: Lab Sheet 3 Ice Cubes with Sand

Name _____

Observations

Sand	Water	Dirt

Conclusions _____

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Erosion: Lab Sheet 4

The Effect of Wind on Sand

Name_____

Observations

Hair Dryer Speed	Effect on Sand
Low	
Medium	
High	

Conclusions_____

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Erosion: Lab Sheet 5

Melting Ice Cubes on Dirt

Name _____

Number of Ice Cubes Used _____

Observations

Pile of Dirt

Conclusions _____
