Unit 5: Changes to Earth's Surface (Earth's Systems)

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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Science: Grade 2

Unit 5: Changes to Earth's Surface

Belleville Board of Education

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Unit Overview

In this unit, students will

- use evidence to explain that some changes to Earth happen slowly.
- use evidence to explain that some changes to Earth happen quickly.
- find solutions to prevent wind from changing the land.
- find solutions to prevent water from changing the land.

Lesson 1 Overview:

- Use information from several sources to provide evidence that some changes to Earth happen slowly over time.

Lesson 2 Overview:

- Use information from several sources to provide evidence that some changes on Earth can happen quickly.

Lesson 3 Overview:

- Compare design solutions that prevent wind and water from changing the land.

Enduring Understanding

Lesson 1

- **Enduring Understanding**: Use information from several sources to provide evidence that some changes to Earth can happen slowly. (weathering and erosion)

- **Essential Question**: What changes on Earth happen slowly?

Lesson 2

- **Enduring Understanding**: Use information from several sources to provide evidence that some changes to Earth can happen quickly. (earthquakes, volcanoes, landslides, hurricanes, floods)
- **Essential Question**: What changes on Earth happen quickly?

Lesson 3

- **Enduring Understanding**: Compare design solutions that slow or prevent wind or water from changing the shape of the land. (changes caused by wind/water, preventing changes)
- **Essential Question**: How can we prevent wind and water from changing the land?

Essential Questions

Unit 5 Essential Questions:

- What changes on Earth happen slowly?
- What occurs during weathering? erosion?
- What changes on Earth happen quickly?
- What occurs during an earthquake? volcano? landslide? flood?
- How can we prevent wind and water from changing land?
- What changes are caused by wind? water?

Exit Skills

By the end of Grade 2, Science Unit 5, the students should be able to:

- describe how weathering by wind, water, ice, and plants causes Earth's surface to change slowly
- describe how erosion by wind, water, and ice causes slow changes to Earth's surface
- describe how earthquakes, volcanoes, landslides, hurricanes, and floods cause Earth's surface to change quickly
- observe how wind and water cause the land to change over time

- explore ways to prevent changes to land through the use of different types of technology

New Jersey Student Learning Standards (NJSLS-S) & NGSS

SEP - Constructing Explanations and Designing Solutions

DCI - Earth Materials and Systems

DCI - The History of Planet Earth

DCI - Optimizing the Design Solution

CCC - Stability and Change

CCC - Influence of Engineering, Technology, and Science on Society and the Natural World

CCC - Science Addresses Questions about the Natural and Material World

NextGen Science Standards

2-ESS2-1	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
2-ESS1-1	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

Interdisciplinary Connections

Do the Math! pp. 235, 249

MA.2.NBT.A	Understand place value.
LA.RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
MA.2.MD.B.5	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
LA.W.2.7	Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).
LA.W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
LA.SL.2.2	Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

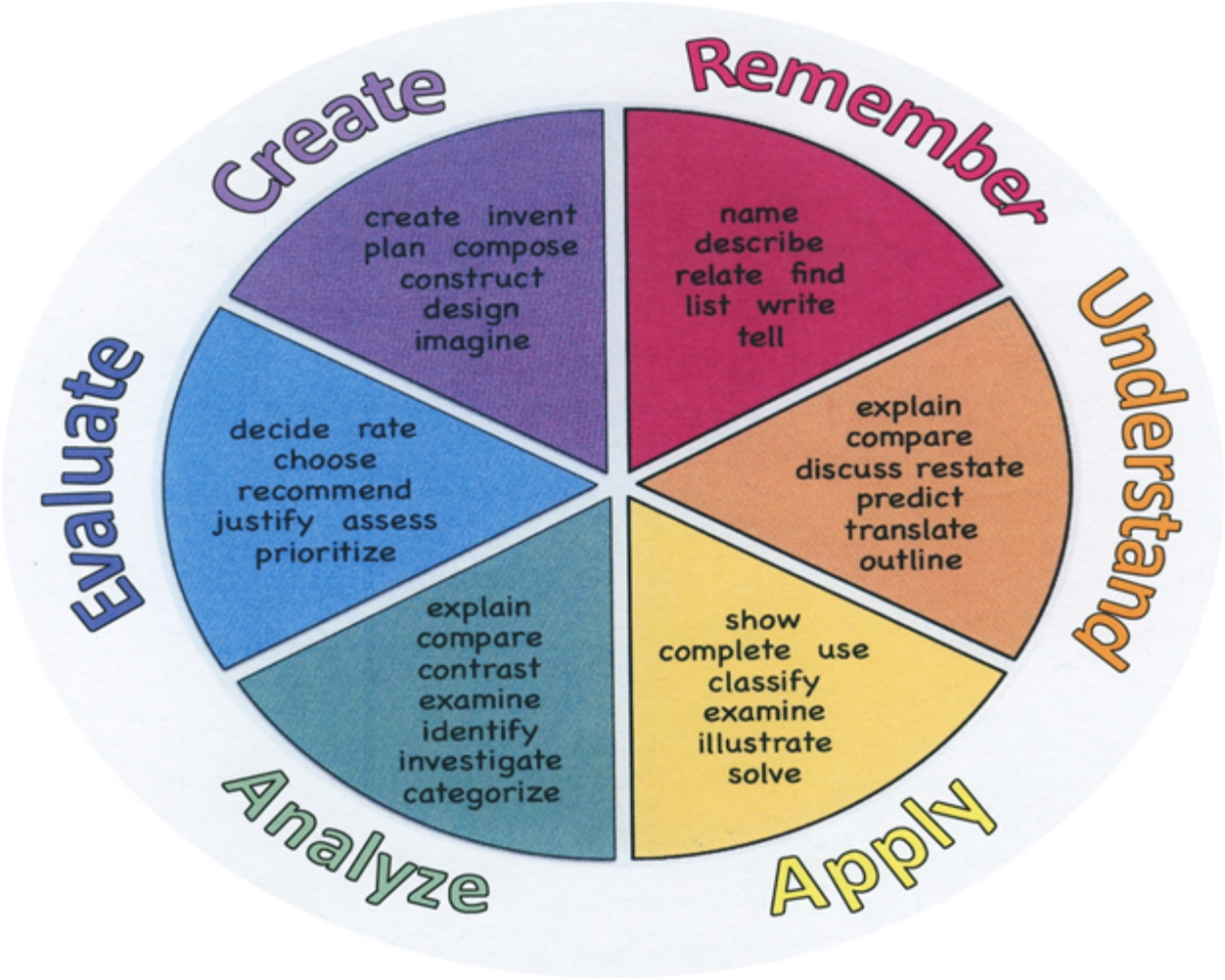
Learning Objectives

Unit 5 Learning Objectives:

- SWBAT: Use information from several sources to provide evidence that some changes to Earth happen slowly over time.
- SWBAT: Use information from several sources to provide evidence that some changes to Earth can happen quickly.
- SWBAT: Compare design solutions that prevent wind and water from changing the land.

Action Verbs: Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make
Omit	Indicate	Select	Subdivide	Determine	Originate
Recite	Interrelate	Show	Survey	Grade	Organize
Select	Interpret	Sketch	Arrange	Justify	Plan
State	Infer	Solve	Breakdown	Measure	Produce
Count	Match	Use	Combine	Rank	Role Play
Draw	Paraphrase	Add	Detect	Rate	Drive
Outline	Represent	Calculate	Diagram	Support	Devise
Point	Restate	Change	Discriminate	Test	Generate
Quote	Rewrite	Classify	Illustrate		Integrate
Recall	Select	Complete	Outline		Prescribe
Recognize	Show	Compute	Point out		Propose
Repeat	Summarize	Discover	Separate		Reconstruct
Reproduce	Tell	Divide			Revise
	Translate	Examine			Rewrite
	Associate	Graph			Transform
	Compute	Interpolate			
	Convert	Manipulate			
	Discuss	Modify			
	Estimate	Operate			
	Extrapolate	Subtract			
	Generalize				
	Predict				



Suggested Activities & Best Practices

- Vocabulary Game- Guess the Word
- Unit Project - Make a Windbreak
- Student Collaborations to build on prior knowledge
- Unit Performance Task - Engineer it activity - Build an Earthquake-Proof Structure

Assessment Evidence - Checking for Understanding (CFU)

- Compare & Contrast
- Evaluate
- HMH End-of-Year Test (Benchmark)

- HMH Mid-Year Test (Benchmark)
- HMH Performance-based Assessment (Alternative)
- Illustration
- Quizzes (Formative)
- Think, Pair, Share
- Unit tests (Summative)

Primary Resources & Materials

HMH Science Dimensions: Teacher Edition, Student workbooks, online resources

HMH Equipment & Safety Kits

HMH Science Dimensions S&E Leveled Readers

- On Level: Why Are Resources Important?
- Extra Support: Why Are Resources Important?
- Enrichment: All About Rocks

Ancillary Resources

Additional Resources:

- online resources to provide further information to students -IXL, quizlet, Bill Nye videos, Earth's Surface Change worksheets https://newpathworksheets.com/science/grade-2/how-does-the-earth-s-surface-change-2064/maryland-standards
- vocabulary cards
- word wall
- posters and anchor charts

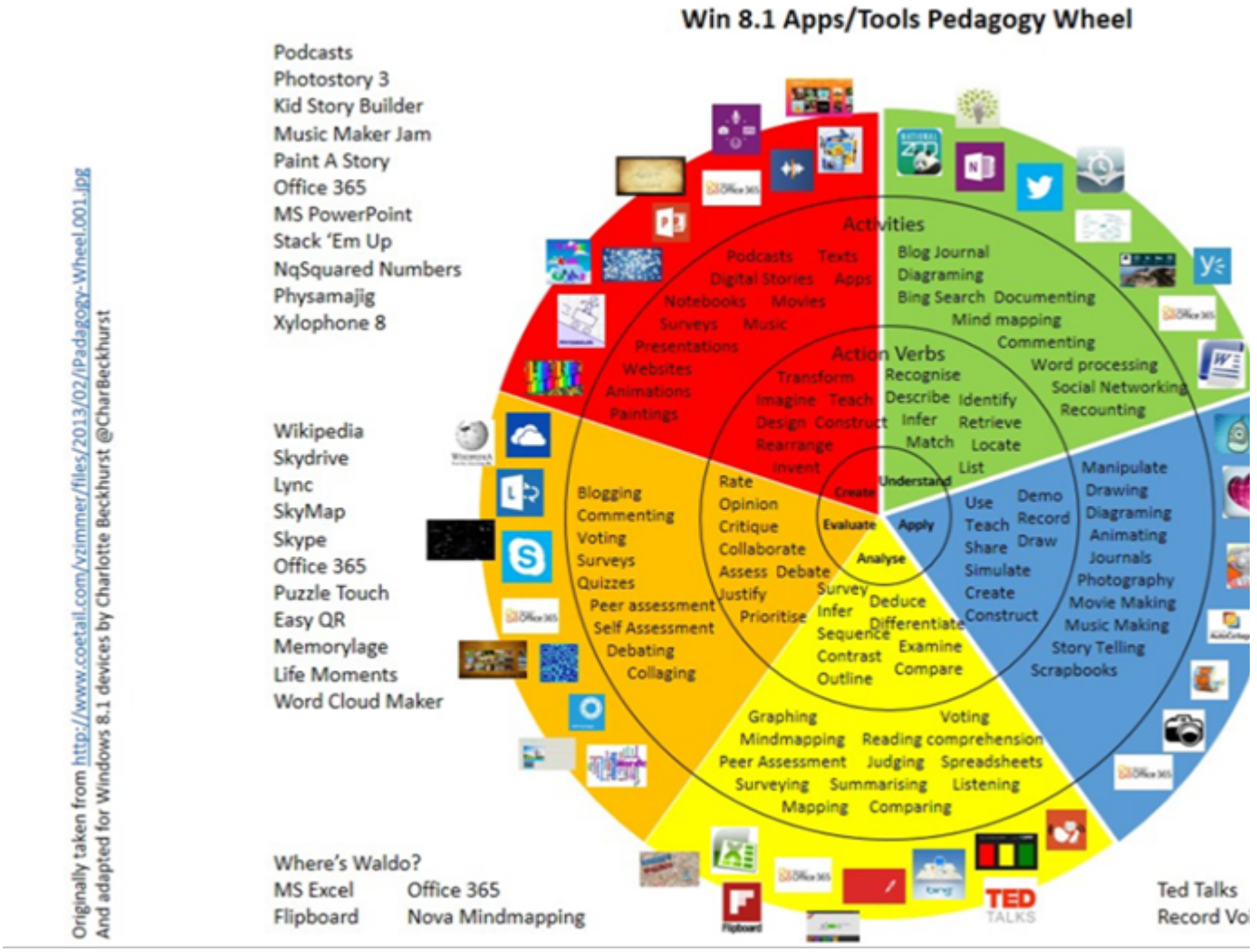
Technology Infusion

Technology available:

- SMART Technology
- Online Websites -
  - Readworks article "Weathering and Erosion" https://www.readworks.org/article/Weathering-and-Erosion/766786c1-2b0c-4b35-b630-a7b2b16b6a8b#!articleTab:content/ and Book of Knowledge, ReadWorks , collection of articles on Natural Disasters https://www.readworks.org/article/Natural-Disasters/dcfb4e7a-b8e7-4f6b-9640-1892327befd9#!articleTab:content/contentSection:5d32024b-e787-429a-94bc-bae13f89bc7e/
  - IXL

- Changes to the Earth's Surface game - https://www.ecosystemforkids.com/games/2nd-grade/earth-processes/activity.html

- Online activities and assessments



Alignment to 21st Century Skills & Technology

Mastery and infusion of **21st Century Skills & Technology** and their Alignment to the core content areas is essential to student learning. The core content areas include:

- English Language Arts;
- Mathematics;
- Science and Scientific Inquiry (Next Generation);
- Social Studies, including American History, World History, Geography, Government and Civics, and Economics;
- World languages;
- Technology;
- Visual and Performing Arts.

CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CAEP.9.2.4.A.4	Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.
TECH.8.1.2.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.2.2.C	Design: The design process is a systematic approach to solving problems.

21st Century Skills/Interdisciplinary Themes

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

21st Century Skills

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

Differentiation

- Work with an assigned partner to compare and contrast how earthquakes, volcanoes, landslides, hurricanes, and floods cause Earth's surface to change quickly using an organizer or poster with five sections.
- Preview concepts at the beginning of the unit.

Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions

- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping

- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

- Photocopy of text with key terms highlighted along with their definitions - each in a different color.

- Center based instruction focused on different factors that change the Earth's surface.

- additional time for skill mastery
- assistive technology
- behavior management plan
- center-based instruction
- check work frequently for understanding
- computer or electronic device utilized
- extended time on tests/quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- printed copy of board work/notes provided
- Provide modifications as dictated in the student's IEP/504 plan
- reduced/shortened reading assignments
- reduced/shortened written assignments
- secure attention before giving instruction/directions

- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- use open book, study guide, test prototypes

English Language Learning (ELL)

- Provide vocab cards - with term, illustration, and definition on one side and blank on the other. Use cards to play a memory game or a quizlet.

- Have students compare only two of the factors that affect the earth's surface.

- using videos, illustrations, pictures, and drawings to explain or clarify
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of work presented or required
- having peers take notes or providing a copy of teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- teaching key aspects of a topic - eliminate nonessential information
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching or fill in the blank tests in lieu of essay tests

At Risk

- Show video of different landscapes which have been formed by wind and water over time, such as https://backpackers.com/watch-wind-and-water-erosion-timelapse-interview-with-creator/.

- Have students compare only two or three of the factors that affect the earth's surface.

- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to correct errors (looking for understanding)
- allowing students to to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of work presented or required

- having peers take notes or providing a copy of the teacher's notes
- marking student's correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- teaching key aspects of a topic - eliminate nonessential information
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, and fill in the blank tests rather than essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

- Design a game to test others on the subject matter from the unit - jeopardy, kahoot!

- Tie what they have learned about changes to Earth's surface to an article in the news.

- above grade level placement option for qualified students
- advanced problem solving
- allow students to work at a faster pace
- cluster grouping
- complete activities aligned with above grade level text using benchmark results
- create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- debate issues with research to support arguments
- flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- multi-disciplinary unit and/or project
- teacher selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- utilize exploratory connections to higher-grade concepts
- utilize project-based learning fro greater depth of knowledge