Unit 8: Natural Resources and Hazards

Content Area: **Science**
Course(s): **Sample Course**
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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Science Grade 4

Unit 8: Natural Resources and Hazards

Belleville Board of Education

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Unit Overview

Unit eight provides detailed information about Natural Resources and Hazards. The content within the unit explores how renewable and nonrenewable resources are used for energy. The unit focuses on discovering how people can reduce land and water based hazards and their impacts.

(Reference HMH Science Dimensions, Unit 8)

Enduring Understanding

- A resource helps you live.
- Water, air, trees, wind, fossil fuels, and sunlight are natural resources.
- Crude oil, coal, and natural gas are nonrenewable resources.
- Nonrenewable resources take hundreds of millions of years to form.
- Nonrenewable resources are being used at a much faster rate than they can be replenished.
- Using fossil fuels has some pros and some cons.
- There are potential risks and benefits of using wind, water, and solar energy compared to fossil fuels.
- Renewable resources are the main forms of energy used before the 20th century.
- Natural hazards can threaten people and property.
- Technology can help keep people safe from natural hazards.
- Some of the natural processes of Earth's surface, its oceans, and its atmosphere can produce water-based hazards.

Essential Questions

- **What nonrenewable resources are used for energy?**
- **What are the effects of using nonrenewable resources?**
- **What renewable resources are used for energy?**
- **What are the potential risks and benefits of using wind, water, and solar energy compared to fossil fuels?**
- **What is the difference between a renewable and nonrenewable resource?**
- **How can people reduce the impact of land-based hazards?**
- **How can people stay safe during natural hazards**
- **What are the effects of natural hazards?**
- **How can people reduce the impact of water-based hazards?**
- **How can people stay safe during water-based hazards?**

Exit Skills

By the end of Grade 4, Science Unit 8, the student should be able to:

- Ask questions and define problems
- Construct explanations and design solutions
- Define and delimit engineering problems
- Develop possible solutions
- Optimize the design solution
- Analyze the influence of science, engineering, and technology on society and the natural world

New Jersey Student Learning Standards (NJSLS-S)

4-ESS3-2	Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
4-ESS3-1	Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.

Interdisciplinary Connections

Connections to Math:

- **MP.2:** Reason abstractly and quantitatively.
- **MP.4:** Model with mathematics.

Connections to English Language Arts:

- View "linked" standards below

LA.RI.4.9	Integrate and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) information from two texts on the same topic in order to write or speak about the subject knowledgeably.
LA.W.4.8	Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

Learning Objectives

In Unit 8, students will demonstrate the ability to:

HMH Science Dimensions, Unit 8 - Lesson 1:

- **Evaluate** information about nonrenewable resources and protecting and reducing the use of nonrenewable resources
- **Determine** how people's needs and wants change over time as they demand new and better technologies
- **Analyze** the effects of using nonrenewable resources

HMH Science Dimensions, Unit 8 - Lesson 2:

- **Compare** the potential risks and benefits of using wind, water, and solar energy to fossil fuels
- **Distinguish** between a renewable and nonrenewable resource
- **Evaluate** the benefits and drawbacks of renewable resources

HMH Science Dimensions, Unit 8 - Lesson 3:

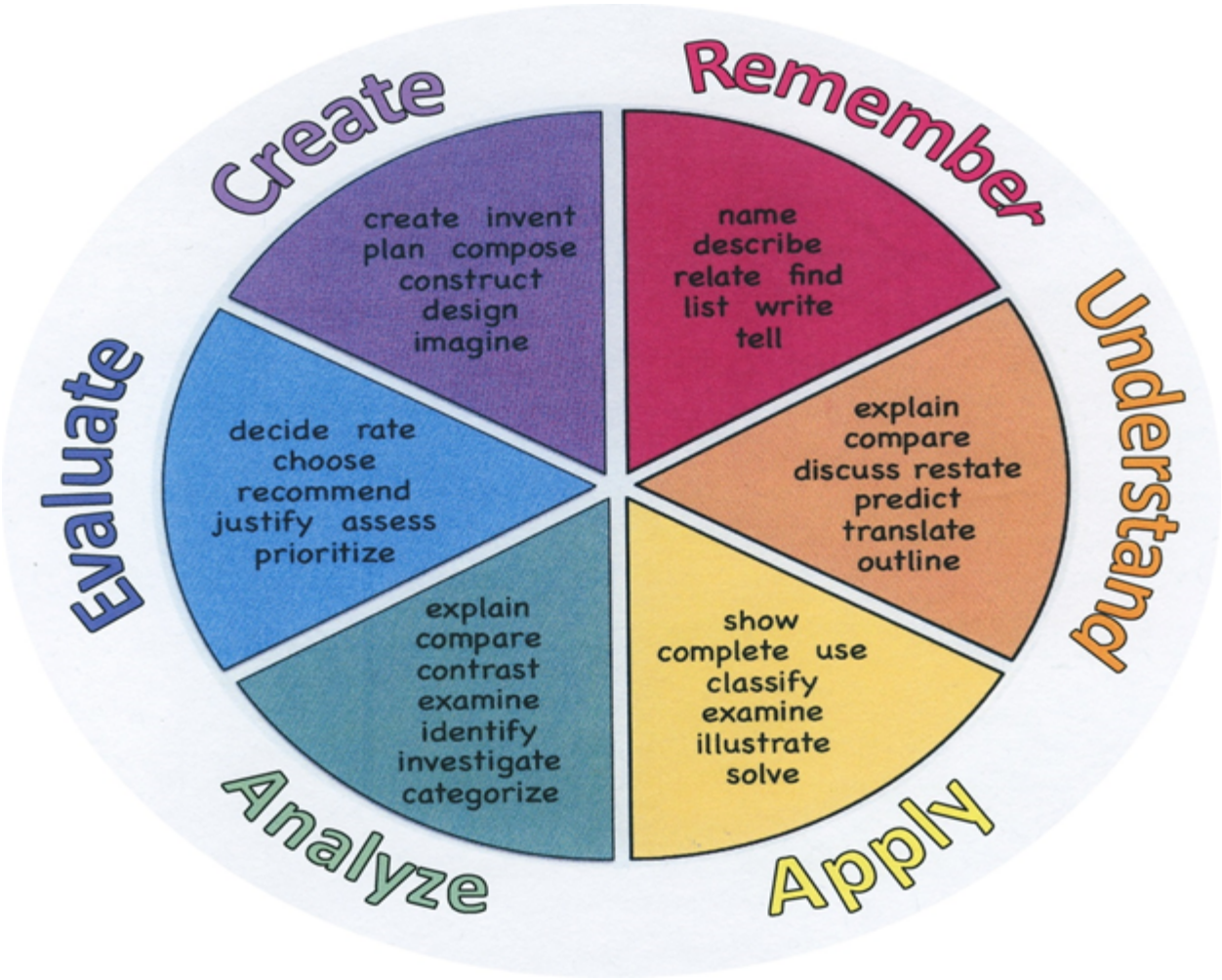
- **Conclude** ways to stay safe when a natural hazard occurs
- **Determine** the cause and effect relationship between natural hazards
- **Analyze** information about how maps can be used to assess the risk of natural hazards

HMH Science Dimensions, Unit 8 - Lesson 4:

- **Construct** explanations for how people can reduce the impact of water-based hazards
- **Analyze** a variety of water-based processes that can be hazardous to humans
- **Design** and test multiple solutions to lessen the impacts of natural Earth processes on humans

Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy. These are useful in writing learning objectives, assignment objectives and exam questions.

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

HMH Science Dimensions, Unit 8 - Lesson 1:

- **Engage:** "Can You Explain It?" lesson
- **Explore/Explain:** "Materials We Use" and "Search and Find" lessons and hands-on activity (Exploration 1 & 2)
- **Elaborate:** "Discover More" extension activity
- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

HMH Science Dimensions, Unit 8 - Lesson 2:

- **Engage:** "Can You Explain It?" lesson
- **Explore/Explain:** "Exploring Renewable Resources" and "Renewable Natural Resources" (Exploration 1 & 2)
- **Elaborate:** "Discover More" extension activity

- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

HMH Science Dimensions, Unit 8 - Lesson 3:

- **Engage:** "Can You Explain It?" lesson
- **Explore/Explain:** "Land-Based Natural Hazards" and "Reducing the Impacts of Land-Based Hazards" (Exploration 1 & 2)
- **Elaborate:** "Discover More" extension activity
- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

HMH Science Dimensions, Unit 8 - Lesson 4:

- **Engage:** "Can You Explain It?" lesson
- **Explore/Explain:** "Water-Based Natural Hazards" and "Reducing the Impact of Water-Based Hazards" (Exploration 1 & 2)
- **Elaborate:** "Discover More" extension activity
- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

HMH Science Dimensions, Unit 8 - Performance Task (Avoiding Disaster):

- **Define Task**
- **Research**
- **Brainstorm**
- **Plan Procedure**
- **Report**
- **Communicate**

HMH Science Dimensions, Unit 8 - Unit Project (Resources Debate):

- **Research and Plan**
- **Analyze Results**
- **Claims, Evidence, and Reasoning**

Evidence of Student Learning - Checking for Understanding (CFU)

- Admit Tickets
- Anticipation Guide

- Compare & Contrast
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- KWL Chart
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Study Guide
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Unit tests

Primary Resources & Materials

Houghton Mifflin Harcourt- HMH Science Dimensions, 2018

Ancillary Resources

Science Weekly, Scholastic News, NewsELA, YouTube/TeacherTube, National Geographics Kids, Science Channel

Technology Infusion

SMARTboard, PowerPoint, Prezi, Social Media, relevant YouTube/TeacherTube videos, HMH Science Dimensions Digital Component, Laptops, WebQuests, Kahoot, Quia

Alignment to 21st Century Skills & Technology

Key SUBJECTS AND 21st CENTURY THEMES

Mastery of key subjects and 21st century themes is essential for all students in the 21st century.

Key subjects include:

- English, reading or language arts
- Mathematics
- Science

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

- Environmental Literacy
- Global Awareness
- Health Literacy

Differentiation

Differentiations:

- Small group instruction
- Small group assignments

- Extra time to complete assignments
- Repeat directions
- Use manipulatives
- Center-based instruction
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Additional time
- Preview vocabulary
- Preview content & concepts
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games
- Independent research and projects
- Learning contracts
- Leveled rubrics
- Multiple intelligence options
- Multiple texts
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Varied supplemental materials

Intervention Strategies

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students 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 workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' 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
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Special Education Learning

- printed copy of board work/notes provided
- additional time for skill mastery
- behavior management plan
- check work frequently for understanding
- computer or electronic device utilizes
- 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
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary

- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- Use open book, study guides, test prototypes

English Language Learning (ELL)

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- 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 workpresented or required
- having peers take notes or providing a copy of the 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
- tutoring by peers
- using true/false, matching, or fill in the blank tests in lieu of essay tests

Sample Lesson

Using the template below, please develop a **Sample Lesson** for the first unit only.

Unit Name:

NJSLS:

Interdisciplinary Connection:

Statement of Objective:

Anticipatory Set/Do Now:

Learning Activity:

Student Assessment/CFU's:

Materials:

21st Century Themes and Skills:

Differentiation/Modifications:

Integration of Technology: