Unit 7: Weather and Patterns

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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Unit 7: Weather and Patterns

Grade 3

Belleville Board of Education

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Unit Overview

Unit 7: Weather and Patterns

In this unit, students will:

- expore how weather is predicted and measured
- learn about the difference between weather and climate
- identify the impact of secere weather on society and nature

Vocabulary

- atmosphere
- climate
- hazard
- precipitation
- rain gauge
- thermometer
- weather
- wind vane

Enduring Understanding

- Weather is what the air is like outside
- Sunshine, wind, clouds, rain, snow are all parts of weather
- Weather occurs in the atmosphere, which is the air around the Earth
- If you measure weather over time and compare the data, you can see weather patterns
- Weather is measureable
- Weather can be measure by amount of precipitation, the direction of the wind, and air temperature
- Weather maps can be constructed show weather in a particular place and time, and variations of this weather across locations
- Different types of weather data can be connected to real-life experiences
- Changes in weather can be observed and analyzed over time
- Average measurements help us see patterns in the weather and help us understand how waether changes over time
- Different areas and locations are more prone to different types of severe weather conditions (Ex: Central part of the U.S. is called Tornado Alley)
- Meteorologists, scientists who study weather, collect data about weather taht has already happenedl to help them predict future weather events
- Engineers work to design solutions for events of severe weather
- Climate is the normal weather in an area of a long period of time
- Climate zones (Tropical, Temperate, Polar) have certain overall features
- There is a great deal of variation in weather that can be measured and analyzed

Essential Questions

- How is weather measured?
- How can we predict weather?
- What are some severe weather impacts?
- What are some types of climates?
- How can weather impact the livelihood of people in society?
- What role does data collection and meteorology play in the functioning of society?
- What are weather patterns that can be observed?

Exit Skills

By the end of Grade 3, Science Unit 7, the student should be able to:

- identify types of weather and some of the tools used to measure weather conditions
- see how patterns can be used to predict weather
- identify hazardous weather and critically examine solutions to problems caused by the weather
- recognize weather patterns from different parts of the world
- represent data in tables and graphical displays to describe typical weather conditions expected during a particular season
- obtain and combine information to describe climates in different regions of the world

- make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard

New Jersey Student Learning Standards (NJSLS-S)

3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
3-ESS2-2	Obtain and combine information to describe climates in different regions of the world.
3-ESS3-1	Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.
3-ESS2-1.1.1	Patterns of change can be used to make predictions.
3-ESS2-2.1.1	Patterns of change can be used to make predictions.
3-ESS3-1.2.1	students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity might or might not signify a cause and effect relationship.
3-ESS2-1.4.1	Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships.
3-ESS3-1.7.1	Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.
3-ESS2-2.8.1	Obtain and combine information from books and other reliable media to explain phenomena.
3-ESS2-1.ESS2.D.1	Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next.
3-ESS2-2.ESS2.D.1	Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.
3-ESS3-1.ESS3.B.1	A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.

Interdisciplinary Connections

Upon completion of this section, please remove all remaining descriptions, notes, outlines, examples and/or illustrations that are not needed or used.

Please list all and any additional **Interdisciplinary Connections/Cross-Curricular** New Jersey Student Learning Standards that link to this unit, and which are not included in the NJSLS section above.

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
LA.RI.3.1	Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
LA.RI.3.7	Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
LA.RI.3.8	Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence) to support specific points the author makes in a text.
MA.3.MD.A.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
LA.W.3.1	Write opinion pieces on topics or texts, supporting a point of view with reasons.
MA.3.MD.B.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.
LA.W.3.7	Conduct short research projects that build knowledge about a topic.
LA.W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
LA.SL.3.4	Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Learning Objectives

Students will demonstrate ability to:

- observe visuals to obtain information about expected weather patterns
- learn how scientists measure and record data about weather
- interpret weather maps and graphs of weather data
- analyze and interpret data about examined patterns of weather conditions scross different times and locations in order to observe patterns of change that can be used to make predictions
- represent weather data tables and bar graphs to reveal patterns that indicate relationships
- identify cause and effect patterns of weather and learn how humans can use that data and technology to lessen the impacts of weather-related hazard
- explore how engineered features are used to help reduce weather damage

- analyze and interpret data to make a claim about a solution against criteria or constraints
- obtain and analyze informations about weather patterns in several climate zones
- investigate how patterns help scientists understand Earth's climate and make predictions
- identify and evaluate characteristics of climate and weather patterns and how animals survive in them

Suggested Activities & Best Practices

HMH Science Dimensions, Unit 7 - Lesson 1:

- **Engage:** "Can You Solve It?" lesson
- **Explore/Explain:** "Whats It Like Out?", "Weather Gadgets", "Weather Everywhere" lessons and hands-on activity (Exploration 1, 2, 3)
- **Elaborate:** "Discover More" extension activity
- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

HMH Science Dimensions, Unit 7 - Lesson 2:

- **Engage:** "Can You Solve It?" lesson
- **Explore/Explain:** "Time and Temperature", "A Year of Change", "Predicting Weather" lessons and hands-on activity (Exploration 1, 2, & 3)
- **Elaborate:** "Discover More" extension activity
- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

HMH Science Dimensions, Unit 7 - Lesson 3:

- **Engage:** "Can You Solve It?" lesson and hands-on activity
- **Explore/Explain:** "Cause and Effect Weather", Using the Data", "Reducing Risk" lessons and hands-on activity (Exploration 1, 2, & 3)
- **Elaborate:** "Discover More" extension activity
- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

HMH Science Dimensions, Unit 7 - Lesson 4:

- **Engage:** "Can You Solve It?" lesson and hands-on activity
- **Explore/Explain:** "Out of Place", "Something Different" 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 7 - Performance Task (A New Job?):

- Define the Goal
- Research

- Brainstorm/Discuss
- Make Forecasts
- Track Forecasts
- Communicate

HMH Science Dimensions, Unit 7 - Unit Project (Safety Plan):

- Research and Plan
- Analyze Results
- Restate Question
- Claims, Evidence, and Reasoning

Evidence of Student Learning - Checking for Understanding (CFU)

- Anticipation Guide
- Compare & Contrast
- Create a Multimedia Poster
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Outline
- Quickwrite
- Quizzes
- Self- assessments
- Socratic Seminar
- Study Guide
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Unit tests

Primary Resources & Materials

Ancillary Resources

- Scholastic News
- Science Weekly
- National Geographic Kids
- Bill Nye the Science Guy and appropriate educational videos
- TeacherTube/Youtube

Technology Infusion

- HMH Online Resources
- Brainpop
- SMARTboard
- PowerPoint
- Social Media
- Relevant YouTube/TeacherTube videos
- HMH Science Dimensions Digital Components
- Laptops
- Kahoot

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.

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
- Global Awareness
- Health Literacy

Differentiation

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

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
- assistive technology
- behavior management plan
- Center-Based Instruction
- 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
- multi-sensory presentation
- 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
- teacher initiated weekly assignment sheet
- 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 computer word processing spell check and grammar check features
- 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: