

## Unit 4 Overview

**Unit Title: Earth's Weather and Climate**

**Grade Level: 6**

**Recommended Pacing:**

2 months – block

**Unit Summary:**

Earth's atmosphere is constantly in motion, continually bringing changes in weather. Oceans affect all living things – even those far from the shore.

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**NGSS:**

MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.

MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

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**Unit 4 ISTE Standards:**

1. a-d Creativity and Innovation-Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes through technology.
2. a-d Communication and Collaboration- Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
3. a-d Research and Information Fluency- Students apply digital tools to gather, evaluate, and use information.
4. a-d Critical Thinking, Problem Solving, and Decision Making –Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

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**Unit 4 Essential Questions:**

- What is the purpose of Earth's atmosphere?
- How does weather describe the current conditions of the atmosphere?
- What causes weather to change?
- What are causes of severe weather?
- How do ocean currents influence climate?

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**Unit 4 Learning Targets**

***Students will be able to...***

- Develop a model to identify and describe the components and their relationships, including: water, energy in the form of sunlight, gravity, atmosphere, landforms, and plants and other living things
- Use the model to account for both energy from light and the force of gravity driving water cycling between oceans, the atmosphere, and land
- Use the model to describe that the transfer of energy between water and its environment drive the phase changes that drive water cycling through evaporation, transpiration, condensation, crystallization, and precipitation
- Use the model to describe how gravity interact with water in different phases and location to drive the water cycle
- From a given investigation plan, provide evidence to answer questions about how motions and complex interactions of air masses

**Unit 4 Learning Targets**

***Students will do...***

- read for content mastery
- develop and use content related vocabulary
- cite specific textual evidence to support analysis of science and technical texts
- complete a variety of laboratory activities to support the content
- write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content
- view various content related videos
- make a model to demonstrate the effect of atmospheric pressure and how it relates to altitude
- analyze a teacher demonstrated model of a low-pressure area
- describe how meteorologists predict the weather

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Unit 4 - Evidence of Learning

**Formative Assessments:**

- Glencoe Level Red Chapters 12 & 13 Section 2 Entry-Level Assessments: Target Your Reading – (TB anticipation guide)
- Glencoe Level Red Textbook Chapter 12&13 Reading Checks and Section Reviews
- Fusion Unit 1 TM 38 Visualize It! The Water Cycle
- Lab work
- Homework
- Brain POP quizzes
- Various content related models

**Summative Assessments:**

- Glencoe Level Red Chapters 12 & 13 assessments
- Glencoe Level Red Chapters 12 & 13 Section quizzes
- Lab assignments
- Unit project

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**Lab Activities:**

- Glencoe Level Red Chapter 12 Launch LAB – How does temperature affect gas molecules?
- Glencoe Level Red Chapter 12 Mini LAB – Observing Condensation and Evaporation
- Glencoe Level Red Chapter 12 Demo – Atmospheric Pressure
- Glencoe Level Red Chapter 12 Mini LAB – Creating a Low-Pressure Center
- Glencoe Level Red Chapter 12 Virtual Lab – How do meteorologists predict the weather?
- Glencoe Level Red Chapter 12 LAB – Interpreting Satellite Images
- Glencoe Level Red Chapter 12 Laboratory Manual: Lab 2 – Hurricanes
- Glencoe Level Red Chapter 13 Laboratory Manual: Lab 1 – Photosynthesis and Sunlight
- Glencoe Level Red Chapter 13 Mini LAB – Modeling a Density Current
- Fusion Lab Unit 1 L2 Modeling the Water Cycle p. 8
- Fusion Unit 2 L1 Modeling Density TM p. 74/Lab Manual pp. 45-48 Ocean Density
- Gizmos: Water Cycle; Water Pollution; Greenhouse Effect

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Unit 4 Materials/Equipment:

**Required Lab Materials:**

safety glasses, dishwashing liquid, narrow-necked plastic bottle, beaker, access to ice, birthday candles, pie pan, tall, narrow jar, clay, glass jars (2 per student) with an opening large enough to hold a funnel, funnel, balance, baking soda, *Elodea* (aquarium plant), test tubes (2 per student), gooseneck lamp with 150-watt bulb or plant light, red food coloring, large sealable freezer bags, small bowls, clear plastic cups, permanent markers, salt, spoons

**Materials/Equipment/Resources:**

Brain POP subscription, Quizlet subscription, Teachers Domain videos, Glencoe Level Red series components, student chromebooks, Smart Board, YouTube access, Fusion Unit 1 Earth's Water teacher's resources