

**Unit 1: Water Cycle and Weather Patterns**  
**6<sup>th</sup> Grade Science**  
Class Meetings 16

*Created July 2020*

**Essential Questions**

- How do the properties and movements of water shape earth's surface and affect its systems?
- What makes a meteorologist successful?
- How does weather impact our lives?

**Enduring Understandings with Unit Goals**

**EU 1: Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter.**

- Develop a model showing the cycling of water.
- Explain the importance of water and its phases of matter.

**EU 2: Scientist use models to represent systems and their interactions within systems.**

- Examine how models aid in predicting weather forecast and outcomes.
- Explain how water vapor in the atmosphere forms clouds.

**Standards**

**Common Core State Standards:**

- **MS-ESS1-4:** Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
- **MS-ESS2-1:** Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
- **MS-ESS2-2:** Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
- **MS-ESS2-3:** Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
- **RST.6-8.:** Cite specific textual evidence to support analysis of science and technical texts.
- **RST.6-8.9:** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
- **6.NS.C.5:** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

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**ISAAC Vision of the Graduate Competencies**

**Competency 1:** Write effectively for a variety of purposes.

**Competency 2:** Speak to diverse audiences in an accountable manner.

**Competency 3:** Develop the behaviors needed to interact and contribute with others on a team.

**Competency 4:** Analyze and solve problems independently and collaboratively.

**Competency 5:** Be responsible, creative, and empathetic members of the community.

**Unit Content Overview**

**1. Water Cycle**

- Sketch a diagram
- Solid, liquid, gas
- Classify cloud formations
- Define precipitation

**2. Weather Forecasting**

- Show how air masses move
- Diagram air pressure and the impact on weather
- Interpret weather fronts
- Examine weather mapping

**3. The Atmosphere**

- Explain the flow of energy
- Define climate and its roll within weather
- Compare and contrast heating and cooling

**Interdisciplinary Connection:**

- Language Arts - Writing
- Math– Computation/Word Problems
- Art – Illustration of systems and creating maps

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**Daily Learning Objectives with *Do Now Activities***

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

- Develop a model showing the cycling of water.
  - *How does the water cycle impact our planet? Support your response with scientific evidence you have collected.*
  - *Compare and Contrast the water cycle as applied to the three states of matter? Do the phases of matter alter the outcome of the water cycle?*
- Combine and organize data to show how air masses affect the weather.
  - *Create a model to explain air masses and their impact on weather patterns and change in weather.*
- Examine how heat transfer works.
  - *Explain and outline how heat of the earth using convection and conduction impacts climate and weather.*
- Apply weather maps and formations to predict weather.\*\*\*
  - *Many weather scientists utilize multiple data points when creating a weather forecast. What skills does a meteorologist need to predict weather?*
  - *How does a meteorologist piece together data to make an accurate forecast?*
- Create a diagram and explain Cloud formations.\*\*
  - *Compare each cloud formation and indicate what is happening with the current weather?*
  - *Generate a daily forecast based upon what cloud formations are present?*
- Construct a weather map using cold and warm fronts.\*\*
  - *Fronts tell scientist the direction of weather and air movement.*
  - *Examine how a cold or warm front make a weather system more or less powerful?*
- Develop a model of the layers of the atmosphere.\*\*\*
  - *Understanding the Troposphere as the main layer that “all weather” takes place, how do the many layers of the atmosphere work in moving air and protecting our planet?*
  - *Create a diagram and explain how each layer works individually and together to make our atmosphere produce weather and air movement to support life on earth using collected data.*

**Instructional Strategies/Differentiated Instruction**

- Power Point Lecture with notetaking
- Guided notetaking
- Warm up activities
- Flexible grouping
- Independent reading
- Lab activities
- Exit slips
- Graphic Organizers
- Creating authentic connections for students
- Vocabulary word bank
- Rephrasing and restatement of information and concepts

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- Tiered instruction
- Alternative test settings
- Reading and accountable talk discussions of texts
- Student-led instruction
- Homework assignments
- Hands-on activities
- SIOP strategies- Teachers implement SIOP strategies to introduce academic vocabulary and use multiple modes of representation including gestural, oral, pictorial, graphic and textural.

### Assessments

#### FORMATIVE ASSESSMENTS:

- Guided notes
- Homework
- Daily Think-Write-Pair-Share (TWPS) Activities
- Accountable Talk Discussions
- Oral questioning
- Exit slips
- Warm Up activities
- Close reading and interpretation of text
- Performance Task – Weather Forecast
  - Future Rubrics Assessment in 2021-2022 school year

#### SUMMATIVE ASSESSMENTS:

- Quiz on EU 1
- Quiz on EU 2
- Performance Task – Weather Forecast
- Unit 1 Test

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**Unit Task**

**Unit Task Name:** Lights, Camera, Forecast! \*\*

**Description:** Students will be provided with a number of maps depicting current weather situations including temperatures for the region, satellite views, isobars, wind speed and direction, and front information. Students work with their weather team to analyze and decipher the data in order to present the forecast for the region (EC2). The team must present an accurate weather forecast to the audience. The forecast will include a written forecast, a weather map, current conditions, and a three-day forecast including components of the water cycle (EU1). The use of terminology, weather symbols, and data analysis must be accurate. The audience expects a forecast that is precise and correct as many people either work outdoors, they may be traveling, or planning outdoor activities based on the information you give them. Some weather conditions may pose a hazard and the students' forecasting abilities must be trusted by the audience or they will not "tune in".

**Evaluation:** Summative Assessment and Future Rubric in 2021-2022 school year

**Unit Resources**

- Non-Fiction Text
- Internet databases
- Large format poster printer
- Microsoft Power Point or Prezi
- Laptops
- NOAA website
- Lab materials