Weather and Climate

Content Area: **Science**
Course(s): **Science 6**
Time Period: **October**
Length: **5 weeks**
Status: **Published**

Weather and Climate Overview

Over a 5 week period, this unit will be broken down into three sub-ideas:the role of water in Earth's surface processes, Earth's large-scale systems interactions, and weather and climate. Students make sense of how Earth's geosystems operate by modeling the flow of energy and cycling of matter within and among different systems. A systems approach is also important, due to examining the feedbacks between systems as energy from the Sun is transferred between systems and circulates though the ocean and atmosphere. This unit should be assessed during the second week of November.

Weather and Climate Priority Standards

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

Essential Questions

- How do air masses affect changes in weather?
- How does the unequal heating and the rotation of the Earth determine climates?
- How does water change its states as it travels through the Hydrologic Cycle?

Weather and Climate Learning Goals

- Students will be able to collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
- Students will be able to develop a model to describe the cycling of water through Earth's systems which are driven by energy from the Sun and the force of gravity.
- Students will be able to develop and use a model to describe how unequal heating and the rotation of the Earth determine regional climates through patterns of atmospheric and oceanic circulation.

Weather and Climate Learning Targets

- Students will be able to determine the effect of different latitude bands on the amount of solar radiation a band receives.

- Students will be able to distinguish between land and sea breezes.
- Students will be able to identify how gravity and the sun's energy affects the water cycle.
- Students will be able to identify the sequence of the water cycle in the proper order.
- Students will be able to make observations about how weather moves across the country.
- Students will be able to match climate conditions to a specific climate zone.
- Students will be able to recall weather conditions associated with high pressure systems, low pressure systems, cold fronts, warm fronts, and stationary fronts.
- Students will be able to recognize and recall specific vocabulary, including: climate, weather, latitude, climate zones, polar zone, temperate zone, tropic zone, coriolis effect, land breeze, sea breeze, salinity, convection, atmospheric circulation, oceanic circulation.
- Students will be able to recognize and recall specific vocabulary, including: evaporation, transpiration, condensation, precipitation, runoff, infiltration, solar radiation, hydrologic cycle, ground water.
- Students will be able to recognize and recall specific vocabulary, including: high pressure system, low pressure system, front, cold front, warm front, stationary front, air mass, forecast, probabilistically.
- Students will be able to summarize how temperature and salinity drives oceanic convection.

Learning Plan

Week	Topic	Lesson Activities	Standard/Learning Goal/Target
Wk 1 - Wk 2	Weather And Climate	Do Now Activities (Warm up) Review Power Point slides from online information together. Explain and discuss how each main phase of the Hydrologic Cycle works. Students draw model of Hydrologic Cycle Use *Readworks* passages on the Hydrologic Cycle Show videos from You Tube of the Hydrologic Cycle: www.youtube.com/watch?v=al-do-HGuIk www.youtube.com/watch?v=xdQdP6eZTUs Assign student worksheets.	**Standard:** Develop a model to describe the cycli sun and the force of gravity. **Learning Goal:** Students will be able to develop a mo which are driven by energy from the S **Learning Target:** Students will be able to develop a con states as it moves through the multipl

Wk 2 - Wk 3	Weather And Climate	Do Now Activities (Warm up) Review Power Point slides from online information together Review weather maps to help with probalistic weather predicitions Use of *Readworks* packets	**Standard:** Collect data to provide evidence for h in changes in weather conditions. **Learning Goal:** Students will be able to collect data to interactions of air masses results in ch
Wk 3 - Wk 4	Weather And Climate	Show You Tube videos on air mass motions: www.youtube.com/watch?v=OBz3fwXX64A www.youtube.com/watch?v=tkK4_F0VKhM Assign student worksheets	**Learning Target:** Students will be able to collect data fr visualizations to show how air masses how sudden changes in weather can r
Wk 3 - Wk 4	Weather And Climate	Do Now Activities (Warm up) Review Power Point slides from online information together Students create models of sunlight-driven longitudinal banding and the Coriolis Effect. Show You Tube videos on the Coriolis Effect: www.youtube.com/watch?v=8ixT7D3f8Qo www.youtube.com/watch?v=5QOVwX-6g-Q Assign student worksheets	**Standard:** Develop and use a model to describe atmospheric and oceanic circulation t **Learning Goals:** *Students will be able to develop a m Earth determine regional climates through p *Students will be able to use a model determine regional climates through patterns of **Learning Targets:** *Students will be able to develop mo

			Coriolis effect, and resulting prevailing winds determine regional c *Students will be able to use models t effect, and resulting prevailing winds determine regional c
Wk 4 - Wk 5	Weather And Climate	Do Now Activities (Warm up) Complete a list of review topics in preparation for unit assessment. Complete an open-note quiz. Complete a standards review worksheet. Complete a Unit learning scale on. Complete a standards-based assessment.	**Standards:** All unit standards listed above in wee **Learning Goals:** Students will review and complete mu basesd assessment. **Learning Target:** Students will complete all assignment teacher to prepare themselves to pass

Assessments

- Do Now Activities
- MS-ESS2-4 Learning Scale
- MS-ESS2-5 Learning Scale
- MS-ESS2-6 Learning Scale
- Teacher-created quizzes
- Teacher-created worksheets
- Unit Benchmark Assessment

Materials & Resources

- Scientific hands-on masterials
- Teacher choice of You Tube videos on the content
- Teacher-created Google Documents
- Teacher-created Google Slides

Supports for At-Risk, Special Ed., 504, and ELL Students

- Have individual students explain content understanding in their own words
- Use a variety of visual aids to help student understanding
- Use different teaching styles to introduce, explain, and reinforce content understanidng
- Use small groups to check for understanding.

Career Readiness, Life Literacies, & Key Skills

TECH.9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
TECH.9.4.8.CI.2	Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
TECH.9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
TECH.9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
TECH.9.4.8.DC.8	Explain how communities use data and technology to develop measures to respond to effects of climate change (e.g., smart cities).
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.
TECH.9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.
TECH.9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.

TECH.9.4.8.IML.5	Analyze and interpret local or public data sets to summarize and effectively communicate the data.