

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

Do Now Activities (Warm up)

Review Power Point slides from online information together

Review weather maps to help with probabilistic weather predictions

Use of *Readworks* packets

Show You Tube videos on air mass motions:

www.youtube.com/watch?v=OBz3fwXX64A

www.youtube.com/watch?v=tkK4_F0VKhM

Assign student worksheets

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:

Collect data to provide evidence of results in changes in weather conditions

Learning Goal:

Students will be able to collect data on interactions of air masses and results in weather changes

Learning Target:

Students will be able to collect data and visualizations to show how air masses move and how sudden changes in weather occur

Standard:

Develop and use a model to describe patterns of atmospheric and oceanic circulation

Learning Goals:

*Students will be able to develop a model of the Earth's atmosphere and oceans

determine regional climates through patterns of atmospheric and oceanic circulation

*Students will be able to use a model to determine regional climates through patterns of atmospheric and oceanic circulation

Learning Targets:

*Students will be able to develop a model of the Earth's atmosphere and oceans

Wk 2
Weather
- And
Climate
Wk 3

Wk 3
Weather
- And
Climate
Wk 4

the Coriolis effect, and resulting
prevailing winds determine region
*Students will be able to use model
Coriolis effect, and resulting
prevailing winds determine region

Do Now Activities (Warm up)

Complete a list of review topics in preparation for unit
assessment.

Standards:

All unit standards listed above in

Learning Goals:

Students will review and complete
based assessment.

Learning Target:

Students will complete all assignments
the teacher to prepare themselves

Wk 4
- Weather
And
Climate
Wk 5

Complete an open-note quiz.

Complete a standards review worksheet.

Complete a Unit learning scale on.

Complete a standards-based assessment.

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 materials
- 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 understanding
- 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.