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

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

the Coriolis effect, and resulting

prevailing winds determine regior

*Students will be able to use mod
Coriolis effect, and resulting

prevailing winds determine regior

| | | Do Now Activities (Warm up) | **Standards:** |
| --- | --- | --- | --- |
| | | | All unit standards listed above in |
| | | Complete a list of review topics in preparation for unit assessment. | |
| Wk 4 - Wk 5 | Weather And Climate | | **Learning Goals:** |
| | | Complete an open-note quiz. | Students will review and complet basesd assessment. |
| | | Complete a standards review worksheet. | **Learning Target:** |
| | | Complete a Unit learning scale on. | Students will complete all assignn the teacher to prepare themselves |
| | | 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 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.