



Marietta City Schools

District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

Science Grade 6

Unit title	Climate and Weather	MYP year	1	Unit duration (hrs)	40 Hours
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Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GSE Standards

Standards

S6E2. Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, Earth, and moon.

c. Analyze and interpret data to relate the tilt of the Earth to the distribution of sunlight throughout the year and its effect on seasons.

S6E3. Obtain, evaluate, and communicate information to recognize the significant role of water in Earth processes.

d. Analyze and interpret data to create graphic representations of the causes and effects of waves, currents, and tides in Earth's systems.

S6E4. Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather.

a. Analyze and interpret data to compare and contrast the composition of Earth's atmospheric layers (including the ozone layer) and greenhouse gases.

(Clarification statement: Earth's atmospheric layers include the troposphere, stratosphere, mesosphere, and thermosphere.)

b. Plan and carry out an investigation to demonstrate how energy from the sun transfers heat to air, land and water at different rates. (Clarification statement: Heat transfer should include the processes of conduction, convection, and radiation.)

c. Develop a model demonstrating the interaction between unequal heating and the rotation of the Earth that causes local and global wind systems.

d. Construct an explanation of the relationship between air pressure, weather fronts, and air masses and meteorological events such as tornadoes and thunderstorms.

e. Analyze and interpret weather data to explain the effects of moisture evaporating from the ocean on weather patterns and weather events such as hurricanes.

S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.

b. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air.

c. Construct an argument evaluating contributions to the rise in global temperatures over the past century. (Clarification statement: Tables, graphs, and maps of global and regional temperatures, and atmospheric levels of greenhouse gases such as carbon dioxide and methane, should be used as sources of evidence.)

Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT)

In fourth grade, students investigate the following:

S4E3. Obtain, evaluate, and communicate information to demonstrate the water cycle.

a. Plan and carry out investigations to observe the flow of energy in water as it changes states from solid (ice) to liquid (water) to gas (water vapor) and changes from a gas to liquid to solid.

b. Develop models to illustrate multiple pathways water may take during the water cycle (evaporation, condensation, and precipitation). (Clarification statement: Students should

understand that the water cycle does not follow a single pathway.)

S4E4. Obtain, evaluate, and communicate information to predict weather events and infer weather patterns using weather charts/maps and collect weather data.

- Construct an explanation of how weather instruments (thermometer, rain gauge, barometer, wind vane, and anemometer) are used in gathering weather data and making forecasts.
- Interpret data from weather maps, including fronts (warm, cold, and stationary), temperature, pressure, and precipitation to make an informed prediction about tomorrow's weather.
- Ask questions and use observations of cloud types (cirrus, stratus, and cumulus) and data of weather conditions to predict weather events.
- Construct an explanation based on research to communicate the difference between weather and climate.

Concepts/Skills to be Mastered by Students

- Earth's Systems
- Ocean and atmosphere patterns
- Water Cycle
- Air masses
- Unequal heating of Earth
- Natural hazards
- Global climate change

Key Vocabulary: (KNOWLEDGE & SKILLS)

Meteorological, Local Winds, Land breeze, Sea breeze, Global Winds, Air Mass, Air Pressure, Maritime, Continental, Polar, Tropical, Convection Current, Coriolis effect, Easterlies, Westerlies, Doldrums, Horse Latitudes, Trade Winds, Jet Stream, ocean currents, Coriolis Effect, Humidity, Storm Surge, Eye, Eye Wall, Low-Pressure Center, Fronts (cold, warm, stationary, occluded), Thunderstorm, Funnel Cloud, Updraft, Downdraft, Vortex, Rotation

Year-Long Anchoring Phenomena: (LEARNING PROCESS)

Earth is the only planet in our solar system that is able to support life.

Unit Phenomena (LEARNING PROCESS)

Thunderstorm then a sunny afternoon, <https://www.youtube.com/watch?v=SJ3Gs0JpxMQ>, Tornado, Hurricane, 4 hours to ATL from LA, but 5 hours to LA from ATL

Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)

Meteorologists know exactly what weather we will experience.

The higher you go up a mountain the more air pressure you will experience.

Cold air rises, and warm air sinks.

Tornadoes are more deadly than hurricanes.

Key concept	Related concept(s)	Global context
Change	Movement (MYP) Patterns (MYP/CCC)	Scientific and Technical Innovation

Change is a conversion, transformation or movement from one form, state or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.		Students will explore the natural world and its laws; the interaction between people and the natural world; how humans use their understanding of scientific principles; the impact of scientific and technological advances on communities and environments; the impact of environments on human activity; how humans adapt environments to their needs.
Statement of inquiry		
Innovations and advancements in science and technology allow meteorologists to identify patterns and more accurately predict weather systems.		
Inquiry questions		
<p>Factual—</p> <p>What is the difference between local and global winds?</p> <p>Conceptual—</p> <p>How does unequal heating create local and global winds?</p> <p>Debatable-</p> <p>Should meteorologists be held responsible for inaccurate weather forecasts?</p> <p>Which is the greater disaster: hurricane or tornado?</p>		
MYP Objectives	Assessment Tasks	
<i>What specific MYP objectives will be addressed during this unit?</i>	<i>Relationship between summative assessment task(s) and statement of inquiry:</i>	<i>List of common formative and summative assessments.</i>
Sciences Design	MYP A- CER and/or debate Should Meteorologists be held accountable for their forecasts? MYP B Inquiring and Designing: How does the power of the sun affect different colors and materials?	<u>Formative Assessment(s):</u> Common Summative Assessments: -Atmospheric Layers -Winds and Fronts <u>Summative Assessment(s):</u>

		Weather and Climate Summative Assessment
Approaches to learning (ATL)		
Category: Thinking Cluster: Critical-Thinking Skill Indicator: Use models and simulations to explore complex systems and issues. Gather and organize relevant information to formulate an argument.		

<u>Learning Experiences</u> Add additional rows below as needed.		
Objective or Content	Learning Experiences	Personalized Learning and Differentiation
c. Develop a model demonstrating the interaction between unequal heating and the rotation of the Earth that causes local and global wind systems.	Convection Experiment- Students will learn how This air circulation drives these weather patterns they are about to learn about. Why not let them visually see it!	Scaffold notes for special education and ESOL
a. Analyze and interpret data to compare and contrast the composition of Earth's atmospheric layers (including the ozone layer) and greenhouse gasses. (Clarification statement: Earth's atmospheric layers include the troposphere, stratosphere, mesosphere, and thermosphere.)	You might think that Earth's atmosphere is the same as the grass outside all the way up to outer space. But the atmosphere is actually made of separate, distinct layers. What makes each layer unique? UCAR - Center for Science Education Using a Model to Analyze and Interpret Data https://scied.ucar.edu/interactive/virtual-ballooning	Scaffold notes for special education and ESOL
b. Plan and carry out an investigation to demonstrate how energy from the sun transfers heat to air, land and water at different rates. (Clarification statement: Heat transfer should include the processes of conduction, convection, and radiation.)	The Power of the Sun How does the power of the sun affect different colors and materials? MYP B Inquiring and Designing	Scaffold notes for special education and ESOL
Content Resources		
Discovery Education Science Techbook - Climate and Weather Unit Resources STEM Project Starter DE Project: Humidity Hits (Immersive Reader Translation) How does humidity impact the number of home runs hit?		

