



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	<i>Climate and Weather & Human Energy Needs</i>	MYP year	<i>1</i>	Unit duration (hrs)	<i>40 Hours</i>
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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's 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, 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 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

- Waves and Currents
- Ocean and atmosphere patterns
- Water Cycle
- Air masses
- Unequal heating of Earth and Rotation of Earth
- Catastrophic Events
- 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)

What causes local and global winds? Why do different parts of the Earth experience different climates? What is the safest storm to encounter?

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
<p>Systems Systems are sets of interacting or interdependent components. Systems provide structure and order in human,</p>	<p>Patterns (MYP/CCC)</p>	<p>Scientific and Technical Innovation 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</p>

natural, and built environments. Systems can be static or dynamic, simple or complex.		impact of scientific and technological advances on communities and environments, the impact of environments on human activity, how humans adapt environments to their needs.
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Statement of Inquiry

Innovations and advancements in science and technology allow meteorologists to identify patterns and more accurately predict weather systems.

Inquiry questions

Factual—
 What is the difference between local and global winds?

Conceptual—
 How does unequal heating create local and global winds?
 Compare and Contrast Earth’s atmospheric layers.
 How does energy from the sun transfer heat to air, land, and water?

Debatable-
 Should meteorologists be held responsible for inaccurate weather forecasts? Why or why not?
 Which is the more extraordinary catastrophic event: hurricane or tornado? Use evidence to support your answer.

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/C- Safest Storm to Encounter MYP D- Climate Crisis Reflections and Solutions	<u>Formative Assessment(s):</u> CFA - Atmospheric layers <u>Summative Assessment(s):</u> MYP A/C- Safest Storm to Encounter

		MYP D- Climate Crisis Reflections and Solutions
Approaches to Learning (ATL)		
Category: Research Skill Indicator: Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.		

Learning Experiences

Add additional rows below as needed.

Objective or Content	Learning Experiences	Personalized Learning and Differentiation
S6E4 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 the air circulation drives these weather patterns they are about to learn about.	Scaffold notes for special education and ESOL
S6E4 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.)	Students will use a model, charts, and graphs to analyze and Interpret data to determine what makes each layer of our atmosphere 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.)	Lab: How does the sun's power affect different colors and materials?	Scaffold notes for special education and ESOL

Content Resources

Discovery Education Science Techbook - Climate and Weather Unit Resources; Brain Pop, Edpuzzle