

UNIT PLAN TEMPLATE

Grade Level 6 Unit #1 8 weeks

Unit Name Weather by Design

Big Idea/Theme: Understand earth's atmosphere and climate.

Culminating Assessment:

Atmosphere Diagram

Diagram layers

Include for each layer –

Facts (location of satellites, weather occurrences, aircraft, radio waves, ozone layer, meteoroids)

Gas composition

Temperature range

Relationship of altitude to air pressure

Diagram must be completed in color (markers, colored pencils, crayons, etc.) on unlined white paper. Include pictures or drawings of objects or natural occurrences found in each layer.

*May include required facts on diagram or on attached separate sheet.

Make a Weather Brochure

Students will choose one of the following areas to research: Egypt, Northern China, Coastal China, Tibet, Southern India, Himalaya's area, Peru, Mexico, Greece, Italy, England, or Somalia. (These areas will be studied this year in Social Studies.)

Criteria:

1. Name of Country
2. Physical Location including longitude and latitude
3. Climate: temperature range, mean temperature, mean precipitation
4. Name, describe, and explain the government's response to any catastrophic weather events in the past five years
5. Biggest current weather problem country is facing
6. Illustrate and define the following: water cycle including precipitation, evaporation, transpiration, condensation
7. Illustrate and define: cumulus, cirrus, stratus, cumulonimbus, nimbostratus, alto cumulus, altostratus
8. Illustrate and define: thunderstorms, hurricanes, tornados, air masses, high pressure, low pressure

Unit Understanding(s)

Students will understand that...

- The earth's atmosphere is composed of layers
- The water cycle and cloud formation are interrelated
- Air masses, pressure systems, fronts, global winds, solar energy and jet streams (weather

Unit Essential Question(s):

- What are the earth's atmospheric layers and their characteristics?
- What are dynamic processes of the water cycle and what part do various clouds play in that cycle?
- How do air masses, pressure systems, fronts, global winds, solar energy and jet streams affect

<p>properties) affect weather conditions</p> <ul style="list-style-type: none"> Weather conditions and patterns are predicted based on data collected. 	<p>weather conditions?</p> <ul style="list-style-type: none"> What are the appropriate tools used to collect data used to predict weather? What is the relationship of weather properties to the earth's climate?
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<p>Students will know... / Students will be able to...</p> <p>Correctly read an anemometer</p> <p>Correctly read a sling psychrometer</p> <p>Correctly read a barometer</p> <p>Correctly read a thermometer</p> <p>Correctly read a rain gauge</p> <p>Correctly read a wind vane</p> <p>Correctly read and interpret weather map symbols</p> <p>Layers of earth's atmosphere</p> <p>Parts of the water cycle</p> <p>Cloud types</p> <p>Air masses, jet streams, global winds and pressure systems relation to weather patterns</p> <p>Predict weather patterns based on weather data</p> <p>Explain the effects of solar energy</p> <p>Characteristics of weather properties</p>	<p>Vocabulary</p> <p><i>Atmosphere</i>-layers of gases surrounding the earth</p> <p><i>Troposphere</i>- layer where all weather occurs</p> <p><i>Stratosphere</i>-layer where the ozone layer is</p> <p><i>Mesosphere</i>- coldest layer of atmosphere where meteorites burn up</p> <p><i>Thermosphere</i> –Layer with very thin, hot air</p> <p><i>Ionosphere</i>- layer of atmosphere containing charged particles allowing radio signals to work</p> <p><i>Exosphere</i>-layer where outer space starts</p> <p><i>Precipitation</i>-after condensation occurs water droplets fall in various forms: rain, snow, freezing sleet, or hail</p> <p><i>Evaporation</i>-the change of water into gas</p> <p><i>Transpiration</i>-release of water from leaves</p> <p><i>Condensation</i>-Water vapor changes to water droplets</p> <p><i>Run-off</i>-precipitation that lands on surfaces and attempts to flow back to sea level</p> <p><i>Cumulus</i>- puffy clouds with flat bottoms that form at medium or low elevation</p> <p><i>Cirrus</i>-wispy clouds consisting of ice crystals formed at high elevations</p> <p><i>Stratus</i>- clouds forming at medium or low elevation and spreading over a large area</p> <p><i>Nimbus</i>-suffix used with cloud name to indicate rain</p> <p><i>Alto</i>-prefix added to a cloud name to indicate medium level clouds formed at about 2-6 kilometers up into the atmosphere</p> <p><i>Fronts</i>- form at boundaries between air masses</p> <p><i>Warm front</i>-when a warm air mass collides and rides over a cold mass; may produce precipitation and warmer temperatures</p> <p><i>Cold front</i>-when a cold air mass collides and slides under a warm air mass; may produce thunderstorms, tornadoes and cooler temperatures</p> <p><i>Stationary Front</i>- when neither a cold nor warm air mass moves at the frontal boundary, may produce long periods of precipitation</p> <p><i>Occluded Front</i>- When a cold air mass pushes</p>
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into a warm air mass that is behind a cool air mass, the warm air mass is pushed above the cool air mass and may produce long periods of precipitation

High pressure system –signals fair weather with winds circulating clockwise

Low pressure system- signals rainy or stormy conditions with counterclockwise circulating winds.

Storm-occurs when pressure differences cause rapid air movement

Thunderstorm- a storm with thunder and lightening, heavy rains, strong winds; form in cumulonimbus clouds, usually along a cold front but also can form within an air mass

Tornado- a rapidly, whirling, funnel-shaped cloud extending down from a storm cloud; low pressure and strong winds can cause great damage; are likely to form when strong thunderstorms are present

Hurricane- low pressure tropical storm that forms over warm ocean water; winds form a spinning circular pattern around the center(eye); lower air pressure is at center with faster winds blowing toward the center

Prediction/Forecast-using collected data to predict future events

Relative Humidity- amount of water vapor air can hold at any given temperature

Anemometer- instrument used to measure wind speed in miles/kilometers per hour

Wind Vane- (wind sock or weather vane) measure wind direction from which the wind is blowing

Thermometer- tool used to measure air temperature in degrees Fahrenheit or Celsius

Sling Psychrometer- a two-thermometer instrument (or wet-dry bulb) used to measure relative humidity

Barometer- a tool used to measure air pressure in inches of mercury or millibars

Rain Gauge- a tool for measuring the amount of precipitation in inches or centimeters

Meteorologist- scientist who collects and studies weather data to make weather predictions/forecast

Global winds- major wind belts

Coriolis Effect – the curving of global winds

South Carolina Academic Standards:

6-4.1 Compare the composition and structure of Earth's atmospheric layers (including the gases and differences in temperature and pressure within the layers).

6-4.2 Summarize the interrelationships among the dynamic processes of the water cycle (including precipitation, evaporation, transpiration, condensation, surface-water flow, and groundwater flow).

6-4.3 Classify shapes and types of clouds according to elevation and their associated weather conditions and patterns.

6-4.4 Summarize the relationship of the movement of air masses, high and low pressure systems, and frontal boundaries to storms (including thunderstorms, hurricanes, and tornadoes) and other weather conditions.

6-4.5 Use appropriate instruments and tools to collect weather data (including wind speed and direction, air temperature, humidity, and air pressure).

6-4.6 Predict weather conditions and patterns based on weather data collected from direct observations and measurements, weather maps, satellites, and radar.

6-4.7 Explain how solar energy affects Earth's atmosphere and surface (land and water).

6-4.8 Explain how convection affects weather patterns and climate.

6-4.9 Explain the influence of global winds and the jet stream on weather and climatic conditions.

6-1.1 Use appropriate tools and instruments (including a spring scale, beam balance, barometer, and sling psychrometer) safely and accurately when conducting a controlled scientific investigation.

























6-1.2 Differentiate between observation and inference during the analysis and interpretation of data.

Interim Assessment (formative)	Vocabulary tests
Quizzes	Tests
Exit slips	Notebooks
Class participation	Projects
Activotes	Work samples
Homework	Diagrams
Study guides	

Key Criteria (to meet the standard/rubric)	
<u>Rubric</u>	<u>Possible Points</u>
for Atmosphere Diagram	
Illustration of layers in relation to Earth	20
Gas composition of atmosphere	13
Temperature ranges of layers	13
Altitude ranges of layers and relation to air pressure	13
Location of objects (satellites, etc.)	13
Location of natural occurrences	13
Legible	5
Neatly colored	5
Correct spelling	5
Rubric for Weather Brochure	
Item	Possible Points

Name of Country	3
Physical location	3
Longitude & Latitude	3
Temperature Range	3
Mean Temperature	3
Mean Precipitation	3
Government Response	3
Current Weather Problem	3
Each definition 4 points each (17 total)	28
Illustrations 4 points each (17 total)	28
Neatness: (legible, neatly colored)	3
3 sources listed	10
Eye Catching Title & Student's name	4
 Total Points	 100
5 points will be taken off for convention mistakes	

United Stream lining Videos that go with this unit:
Hands on Weather II: More Weather Experiments----Segment 2 deals
With the sling psychrometer
Severe Weather Safety: Watch for the Warning

Chapter Test: Weather
 -5611 Climate and Weather
 -5620 Climatology and Meteorology
 Lesson Quiz: Weather & Climate
 -5601 Water, Water Everywhere
 -5615 The Water Cycle
 Lesson Quiz: The Water Cycle
 -5616 Inside the Bubble: Earth's Atmosphere
 -5617 Atmosphere
 Lesson Quiz: Layers of the Atmosphere
 -5636 Clouds
 -5637 Classifying Clouds
 Lesson Quiz: Classification of Clouds
 -5613 Using Weather Instruments
 -5638 Weather Watcher Part 2
 Lesson Quiz: Instruments to Collect Data
 -5629 Using Instruments to Study Weather
 -5639 Weather Watcher Part 2
 Lesson Quiz: Air Pressure & Humidity
 -5618 Air Masses
 -5640 Looking at Weather Maps
 Lesson Quiz: Identify Pressure Systems
 -5641 Forecasting Weather
 -5642 Weather Predictions
 Lesson Quiz: Develop Forecasts