

MAPPING GRADE 6 SCIENCE INSTRUCTION

Concept: Weather

PWC Objective: 6.6

The student will investigate and understand the properties of air and the structure and dynamics of the Earth's atmosphere. Key concepts include:

- composition of air **(SOL 6.6a)**
- air pressure, temperature, and humidity **(SOL 6.6b)**
- how the atmosphere changes with altitude **(SOL 6.6c)**
- natural and human-caused changes to the atmosphere **(SOL 6.6d)**
- the relationship of atmospheric measures and weather conditions **(SOL 6.6e)**
- weather map information (fronts, systems, severe weather, basic measurements) **(SOL 6.6f)**
- importance of protecting and maintaining air quality **(SOL 6.6g)**

What Students Should Know (Critical Attributes)	What Students Should Be Able To Do (Essential Skills)
<p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> • What is the composition of the air? • What are air pressure, temperature, and humidity? • How does the atmosphere change with altitude, natural and human-caused changes to the atmosphere? <p><u>Critical Attributes:</u></p> <p>6.6a Air is a mixture of gaseous elements and compounds. These include nitrogen, oxygen, water, argon, and carbon dioxide. Nitrogen makes up the largest proportion of the air.</p> <p>6.6b Moisture in the air is called humidity.</p> <p>6.6b Air exerts pressure. Air pressure decreases with altitude.</p> <p>6.6b Temperature decreases with altitude in the lowest layer of the atmosphere.</p> <p>6.6c The atmosphere is made up of layers (the troposphere, stratosphere, mesosphere, and thermosphere) that have distinct characteristics.</p>	<ul style="list-style-type: none"> • Identify the composition and physical characteristics of the atmosphere. • Comprehend and apply basic terminology related to air and the atmosphere (humidity, air pressure, altitude). • Analyze and interpret charts and graphs of the atmosphere in terms of temperature and pressure. • Measure and record air temperature, air pressure, and humidity using appropriate units of measurement and tools.

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What Students Should Know (Critical Attributes)	What Students Should Be Able To Do (Essential Skills)
6.6c Most of the air that makes up the atmosphere is found in the troposphere, the lowest layer. Virtually all weather takes place there.	
6.6d Forest fires and volcanic eruptions are two natural processes that affect the Earth's atmosphere. Many gaseous compounds and particles are released in the atmosphere by human activity. All of the effects of these materials are not yet fully understood.	<ul style="list-style-type: none">• Analyze and explain some of the effects that natural events and human activities have on weather, atmosphere, and climate.
6.6e The amount of heat energy, water vapor, and the pressure of the air largely determine what the weather conditions are.	<ul style="list-style-type: none">• Design an investigation to relate temperature, barometric pressure, and humidity to changing weather conditions.
6.6e Clouds are important indicators of atmospheric conditions. Clouds are formed at various levels within the troposphere. Three major types of clouds are cumulus, stratus, and cirrus clouds.	<ul style="list-style-type: none">• Compare and contrast cloud types, and relate cloud types to weather conditions.
6.6f Storms such as hurricanes, tornadoes, and thunderstorms occur along fronts, due to differences in air masses.	<ul style="list-style-type: none">• Compare and contrast weather-related phenomena including thunderstorms, tornados, hurricanes, and drought.
6.6f Weather maps show much useful information about descriptive air measurements, observations, and boundaries between air masses (fronts). The curved lines showing areas of equal air pressure and temperature are key features of weather maps. Weather maps are important for understanding and predicting the weather.	<ul style="list-style-type: none">• Interpret basic weather maps, and make forecasts based on the information presented. Map the movement of cold and warm fronts and interpret their effects on observable weather conditions.
6.6g Ozone, a form of oxygen, can form near the surface when exhaust pollutants react with sunlight. This pollutant can cause health problems. Naturally occurring ozone is also found in the upper atmosphere and helps to shield the Earth from ultraviolet radiation.	<ul style="list-style-type: none">• Compare and contrast types of precipitation.• Explain the role of ozone in the atmosphere.
6.6g Maintaining good air quality is a crucial goal for modern society.	<ul style="list-style-type: none">• Evaluate the role of the individual (include the student's role personally) in protecting air quality.