WAUCONDA SCHOOL DISTRICT 118
8th Grade Earth Science
Unit 4: Atmosphere & Weather

ESSENTIAL QUESTIONS

Essential Questions:

- How are observable patterns and processes on Earth affected by Earth's position and behavior as a planet in our solar system?
- How do scientists draw conclusions about the natural world and its processes using direct and indirect observations?
- How can the transfer of energy be tracked as the energy flows through Earth's natural systems?
- How have connections between historical scientific discoveries and technological advancements led to our modern understanding of Earth's functions?
- How do scientists design experiments in order to predict phenomena in natural or designed systems?
- How have the interactions between Earth's systems shaped Earth's history and its future and what is the influence that humans have had on those systems?
- How can models be used to study systems that are too large or small to observe in real-time or space?
- Why is the prediction of Earth's patterns and systems so complex?

Big Ideas:

- Properties of air
- Atmosphere
- Weather factors
- Weather patterns
- Forecasting

NGSS (Priority Standards):

- MS-ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process
- MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions
- 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

- MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effect
- MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

OBJECTIVES

Concepts (What students need to know)	Performance Tasks (What students will be able to do)
• Properties of air • Layers of the atmosphere • Air quality • Heat transfer • Air Currents • Relative humidity • Air masses • Fronts • Weather maps • Predicting the weather • Severe storms	*Students will:* • explain why air is considered matter. • understand the force of air pressure and how it changes within our atmosphere. • explain the basic composition of Earth's atmosphere. • demonstrate the effects of human actions on Earth's atmosphere. • analyze the effects of human actions on Earth's ozone layer and the atmosphere. • explain how heat is transferred within the atmosphere. • investigate and analyze the heat-trapping abilities of Earth and water. • understand what wind is and how it forms. • Understand the relationship between temperature and humidity. • identify the four types of air masses and how they differ. • explain how fronts form and the type of weather associated with each. • analyze the daily weather patterns. • predict the weather based on previous patterns. • explain how lightning occurs within a cumulonimbus cloud and how it relates to thunder. • understand how a tornado forms. • analyze hurricane data to track its future path.

Suggested Resources/Materials/Informational Text

- McGraw Hill iScience Textbook series and digital resources
- Teacher created resources and activities
- Videos and video clips