

Ridgefield Public Schools

Meteorology Curriculum at a Glance

Overview

The purpose of this course is to investigate the physical factors which contribute to weather and climate in the earth's atmosphere. Students will become familiar with the concepts, instruments and techniques used to observe, measure, and record daily atmospheric conditions. Weather systems will be analyzed and synoptic forecasting techniques will be developed. Concepts related to local and global climatology will also be introduced including issues related to air pollution and long-term climate change.

Units of Study	
Unit 1:	Introduction to Meteorology 1. Overview of Meteorology • Definition and importance to life on Earth • History of meteorology 2. Atmospheric Composition and Structure • Layers of the atmosphere • Chemical composition • Evolution through time 3. Basic Weather Elements • Temperature • Pressure • Wind • Humidity
Unit 2:	Atmospheric Dynamics and Thermodynamics 1. Heat Transfer in the Atmosphere • Radiation, conduction, convection



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	• The greenhouse effect 2. Atmospheric Pressure and Wind • Pressure systems • Coriolis effect • Global wind patterns 3. Moisture in the Atmosphere • Humidity • Dew point • Adiabatic processes
Unit 3:	Weather Systems and Patterns 1. Cloud Formation and Precipitation • Types of clouds • Mechanisms of precipitation 2. Air Masses and Fronts • Classification of air masses • Types of fronts • Frontogenesis and frontolysis 3. Cyclones and Anticyclones • Structure and dynamics • Mid-latitude cyclones • Tropical cyclones
Unit 4:	Severe Weather and Climate 1. Thunderstorms and Tornadoes • Formation and lifecycle • Tornado formation and classification 2. Hurricanes • Structure and development • Impacts and forecasting 3. Climate and Climate Change • Climate vs. weather • Climate classification



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	• Evidence and impacts of climate change
Unit 5:	Meteorological Observations and Forecasting 1. Meteorological Instruments and Observations • Weather stations • Remote sensing (satellites, radar) 2. Weather Analysis and Modeling • Data assimilation • Numerical weather prediction models 3. Weather Forecasting Techniques • Short-term and long-term forecasting • Interpreting weather maps and charts

