New York Science

MS. Weather and Climate

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A Performance Expectations MS.ESS2.WC

1. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. MS.ESS2.5
2. Develop and use a model to describe how unequal heating and rotation of Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. MS.ESS2.6
3. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. MS.ESS3.5

B Science and Engineering Practices MS.WC.SEP

1. Asking Questions and Defining Problems MS.WC.SEP.1
   a. Ask questions to identify and clarify evidence of an argument. (MSESS3-5) MS.WC.SEP.1A
2. Developing and Using Models MS.WC.SEP.2
   a. Develop and use a model to describe phenomena. (MS- ESS2-6) MS.WC.SEP.2A
3. Planning and Carrying Out Investigations MS.WC.SEP.3
   a. Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions. (MS-ESS2-5) MS.WC.SEP.3A

C Disciplinary Core Ideas MS.WC.DCI

1. ESS2.C: The Roles of Water in Earth's Surface Processes MS.WC.DCI.ESS2.C
   a. The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. (MS-ESS2-5) MS.WC.DCI.ESS2.C.1
   b. Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (MS-ESS2- 6) MS.WC.DCI.ESS2.C.2
2. ESS2.D: Weather and Climate MS.WC.DCI.ESS2.D
   a. Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. (MS-ESS2-6) MS.WC.DCI.ESS2.D.1
   b. Because these patterns are so complex, weather can only be predicted probabilistically. (MS-ESS2-5) MS.WC.DCI.ESS2.D.2
   c. The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents. (MS-ESS2-6) MS.WC.DCI.ESS2.D.3
3. ESS3.D: Global Climate Change MS.WC.DCI.ESS3.D
   c. Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth’s mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5) MS.WC.DCI.ESS3.D.1

D Crosscutting Concepts MS.WC.CC

1. Cause and Effect MS.WC.CC.1
   a. Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MSESS2-5) MS.WC.CC.1A
2. Systems and System Models MS.WC.CC.2
   a. Models can be used to represent systems and their interactions— such as inputs, processes and outputs—and energy, matter, and information flows within systems. (MS-ESS2-6) MS.WC.CC.2A
3. Stability and Change MS.WC.CC.3
   a. Stability might be disturbed either by sudden events or gradual changes that accumulate over time. (MS-ESS3-5) MS.WC.CC.3A