6 Science Unit 1: Climate

Content Area: **Science**
Course(s):
Time Period: **Marking Period 2**
Length: **9 Weeks**
Status: **Published**

Unit Overview

The Atmosphere and Energy

Adventurers who brave extreme weather conditions to trek across California's scorching Death Valley and Antarctica's frozen surface must be prepared. The Extreme Adventures Company has hired you to design equipment for these adventurers to help them stay healthy and safe.

Weather

You are part of a team working for the National Oceanic and Atmospheric Administration (NOAA). Your task is to develop instruments for measuring atmospheric conditions, interpret weather maps, make weather forecasts, issue severe weather warnings, and create severe weather action plans.

Climate

The major impacts of the rise in average global temperature include: rising sea level, changing weather patterns, and disruption of ecosystems. Design a plan to mitigate and/or adapt to one of these aspects of climate change.

Standards

Science and Engineering Practices

- Analyzing and Interpreting Data
- Asking Questions and Defining Problems
- Constructing Explanations and Designing Solutions
- Developing and Using Models
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information
- Planning and Carrying Out Investigations
- Using Mathematics and Computational Thinking

Crosscutting Concepts

- Cause and Effect
- Patterns
- Scale, Proportion, and Quantity
- Stability and Change

- Structure and Function
- Stems and System Models

MS-PS3-3	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
MS-PS3-4	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
MS-PS3-5	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
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-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
MS-ETS1-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Materials

Core Materials:

- TCI Weather & Climate Text and Online Resources
  - The Atmosphere and Energy
  - Weather
  - Climate
- Teacher Created Labs

Supplemental Materials:

- Gizmos
- BrainPop resources
- GRC Lessons
- Nearpod Activities

Technology

9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a

	specific purpose.
9.4.8.IML.1	Critically curate multiple resources to assess the credibility of sources when searching for information.
8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.
8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Evidence of Learning/Assessment

Formative Assessment

- Teacher Observation
- Quizzes
- Exit Tickets
- Labs

Summative Assessment

- Unit Tests
- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

Follow IEP Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

504

Follow 504 Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe

At-risk of Failure

- Extra time during intervention
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe

Gifted & Talented

- Independent projects
- STEM Projects

Interdisciplinary Connections

L.VL.6.3	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, including technical meanings, choosing flexibly from a range of strategies.
6.NS.B	Compute fluently with multi-digit numbers & find common factors & multiples
	Geospatial technologies and representations help us to make sense of the distribution of people, places and environments, and spatial patterns across Earth's surface.
RI.CR.6.1	Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.
RI.CI.6.2	Determine the central idea of an informational text and explain how it is supported by key details; provide a summary of the text distinct from personal opinions or judgments.
6.EE.A.2	Write, read, and evaluate expressions in which letters stand for numbers.
W.AW.6.1.B	Support claim(s) with logical reasoning and relevant, accurate data and evidence, that demonstrate an understanding of the topic or text, using credible sources.
W.AW.6.1.C	Use words, phrases, and clauses to link and clarify the relationships among claim(s), reasons and evidence.
W.IW.6.2	Write informative/explanatory texts (including the narration of historical events, scientific procedures/experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
6.SP.B.4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
6.2.8.GeoPP.3.a	Use geographic models to describe how the availability of natural resources influenced the development of the political, economic, and cultural systems of each of the classical civilizations and provided motivation for expansion.
6.2.8.GeoPP.3.b	Explain how geography and the availability of natural resources led to both the development of classical civilizations and to their decline.

Career Readiness, Life Literacies, and Key Skills

9.2.8.CAP.3	Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.3	Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
9.4.8.DC.1	Analyze the resource citations in online materials for proper use.
9.4.8.TL.3	Select appropriate tools to organize and present information digitally.

Career Ready Practices

- CRP2. Apply appropriate academic and technical skills.

- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP7. Employ valid and reliable research strategies.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11. Use technology to enhance productivity.
- CRP12. Work productively in teams while using cultural global competence