

Unit 7: Earth's Cycles and Climate Change Week 27-34

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **9 weeks**
Status: **Published**

Standards Alignment

- **MS-ESS2-4:** Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- **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 atmospheric and oceanic circulation work together to determine regional climates.

New Jersey Student Learning Standards

Performance Expectations:

- **MS-ESS2-4:** Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
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- **MS-ESS2-6:** Develop and use a model to describe how atmospheric and oceanic circulation work together to determine regional climates.

Key Ideas and Details

LA.K-12.NJSLSA.R1

Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

LA.K-12.NJSLSA.R3

Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Integration of Knowledge and Ideas

LA.K-12.NJSLSA.R7

Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

LA.K-12.NJSLSA.R8

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

LA.K-12.NJSLSA.R9

Analyze and reflect on how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

LA.RST.6-8

Reading Science and Technical Subjects

Key Ideas and Details

LA.RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
LA.RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
LA.RST.6-8.8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
LA.RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
SCI.MS-ESS2	Earth's Systems
SCI.MS-ESS2-5	Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
SCI.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.
SCI.MS-ESS3	Earth and Human Activity
SCI.MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
SCI.MS-ESS3-2	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
SCI.MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
SCI.MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
SCI.MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused climate change over the past century.

Integration of Career Readiness, Life Literacies and Key Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP3	Attend to personal health and financial well-being.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology / Integration of Computer Science and Design Thinking

TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.8.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
TECH.8.1.8.A.3	Use and/or develop a simulation that provides an environment to solve a real world problem or theory.
TECH.8.1.8.D	Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
TECH.8.1.8.D.5	Understand appropriate uses for social media and the negative consequences of misuse.
TECH.8.1.8.F	Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.1.8.F.1	Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.

Interdisciplinary Connections: NJSLs for ELA, Social Studies, Science and/or Math Section

LA.RL.6	Reading Literature Text Key Ideas and Details
LA.K-12.NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
LA.RL.6.3	Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.
LA.K-12.NJSLSA.R3	Analyze how and why individuals, events, and ideas develop and interact over the course of a text.
LA.RI.6	Reading Informational Text
LA.RI.6.1	Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.
LA.K-12.NJSLSA.W	Writing Text Types and Purposes
LA.K-12.NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
LA.W.6.1	Write arguments to support claims with clear reasons and relevant evidence.
LA.W.6.1.A	Introduce claim(s) and organize the reasons and evidence clearly.
LA.W.6.1.B	Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.
LA.W.6.1.C	Use words, phrases, and clauses to clarify the relationships among claim(s) and reasons.

Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media LiteracyNew Section

see Crosswalks

21st Century Life and Careers

Stage I: Desired Results

Transfer/Overview/Rationale

Transfer / Overview / Rationale

Unit Rationale

The purpose of this unit...

The Earth systems naturally operate on a process of recycling. When more resources are taken from that Earth than are being replaced, the operating system becomes off balanced. The results are impacting Earth's weather patterns and the overall climate.

Meaning

Essential Questions

Essential Questions

1. What does the water cycle have to do with the weather?
2. What is the carbon cycle and what does it have to do with climate change?

3. How is human activity accelerating the rate of climate change and how do we know?

4. What can we do as individuals to help with the problem of climate change?

Enduring Understanding/Indicators of Understanding

Enduring Understanding/Indicators of Understanding

1. Understand the layers of the atmosphere and the role each has.

2. Understand what climate is and how and why it is changing.

3. Be able to understand the difference between climate and weather.

4. Understand the difference between the basic types of clouds and what and how they relate to weather: cirrus, cumulus, stratus.

Acquisition (Student Learning Objectives)

Knowledge

Knowledge

Students will know...

1. Materials are recycled by the Earth by natural processes or cycles.

2. Movements within the atmosphere create weather changes.

3. Human activities affect climate change.

Skills

Skills

Student will be skilled at ...

1. Interpreting a weather-satellite image.

2. 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.

3. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

4. Making more informed decisions concerning resource consumption.

Stage 3: Learning Plan

Resource and Mentor Texts

Resources and Mentor Texts

textbook

websites

weather data (specifically)

satellite images

campus

<https://www.smithsonianmag.com/videos/category/science/climate-change-101-with-bill-nye-the-science/>

<https://weather.com/>

<http://www.nps.gov/hafo/forteachers/upload/Scope%20&%20Sequence.pdf>

<http://learnmoreaboutclimate.colorado.edu/lessons/view/id/6>

https://www.facingthefuture.org/Curriculum/PreviewandBuyCurriculum/tabid/550/CategoryID/4/List/1/Level/a/ProductID/15/Default.aspx#.U_OgspRdVu4

<https://sites.google.com/site/cbqclimate/curriculum-materials/grades-4-6-curriculum>

Formative Assessment Strategies

Formative Assessment Strategies

labs

pre-test

writing prompts

test

Science Starters

exit tickets

quizzes

Adopt-a-city weather journaling

Weathering, Erosion and Deposition test

Weathering, Erosion and Deposition lab

Companies that use recycled materials- oral report

[Adopt a City
Weathering, Erosion and Deposition.gdoc](#)

Learning Activities/Unit of Study

Learning Activities/Unit of Study

Notes on weather

Adopt a city- weather journal

notes/videos on climate change

data analysis on climate change

incorporate a book project about climate change

[weathering_rev.ppt](#)
[What is weathering notes.docx](#)
[weathering, erosion, deposition webquest](#)
[Adopt a city instructions.docx](#)
[Adopt a city.docx](#)
[Atmosphere Notes.docx](#)
<http://mjksciteachingideas.com/pdf/AtmosphereFoldable.pdf>
[Severe Weather Research Project.docx](#)
[Atmosphere and Weather.pptx](#)
[Weather Notes.docx](#)
[weather log.docx](#)
[Under the Weather.pptm](#)
[Atmosphere Weather test.docx](#)
[Atmosphere Webquest](#)

Modifications and/or Accommodations

Suggested Modifications (ELL, Sp. Ed, Gifted, At-risk of Failure)

English Language Learners

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

Special Education Students

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for

students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

Students with 504 Plans

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Gifted & Talented Strategies

Extensions/Enrichments: Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

Modify/Change Activities: Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

Students at Risk of School Failure

Directions or Instructions: Make sure directions and/or instructions are given in limited numbers. Give directions/instructions verbally and in simple written format. Ask students to repeat the

instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

Peer Support: Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for clarification before going to you.

Alternate or Modified Assignments: Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

Increase One to One Time: When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and there will go a long way to intervene as the need presents itself.

Contracts: It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of using contracts is to eventually have the student come to you for completion sign-offs.

Hands On: As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

Tests/Assessments: Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

Seating: Seat students near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.