Unit Goal / Focus:

Weather and Climate

This unit focuses on the topic of weather and climate as it relates to global climate change.

Common Core Learning Standards

HS-ESS 2-4

Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate

HS-ESS 2-4

Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

Essential / Focus Question(s):

- What regulates weather and climate?
- How does the shape of the earths orbit affect climate?
- How does the suns energy output affect climate?
- Do humans have an impact on the climate?
- How do changes in the atmosphere affect climate (greenhouse gases)?

Content Objectives:

Students will know...

- Climate science is complex
- the earths orbit and its affect on climate
- The suns energy output affects climate
- Climate change is cyclical process
- Human impact on climate change is a concern to everyone

Skills / STRATEGIES objectives:

- Explain what regulates weather and climate
- Apply the Milankovitch Cycle to critique the global warming debate.
- Connect how ocean ~~changes~~ circulation influences and changes weather.

Language Objectives & Vocabulary

Students will learn to apply these Vocabulary ~~words~~ terms:

Atmosphere, Ozone, methane, heat trapping, burning, dioxide, climate, volcanic eruptions

Challenging Words: climatologist, predict, green house, precession, eccentricity, stratosphere, Industrial Revolution, climate modeling

Vocabulary will be displayed and defined on varies climate history graphs and possible climate future graphs around the classroom.

Predict
Magnitude
Concentration
Radiation
Absorption
Reflection
Glaciers

STAGE 2

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END of Unit Assessment / Performance Task:

- Students will create a lab manuel
- In groups the students will create climate history graphs and climate future graphs
- One representative from each group will give a 5-10 minute presentation justifying their predictions and cite evidence collected throughout the week
- The rest of class will have the opportunity to challenge hypotheses in order to differentiate between empirical evidence and anecdotal evidence

STAGE 3: LEARNING PLAN

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Learning Plan

Texts:

These will depend on the texts that are available to each teacher but some suggestions for content reading are:

Common Core Basics / Science McGraw Hill
pages ~~0000~~ 1, 2 3, 412 421, 398 371
1, 2 3, 371, 398, 412, 421 to 424.

Pearsons Concepts and Challenges

Physical Science McGraw Hill
pg 377, 541, 565, 597

~~Resources and Materials~~

Website scotese.com/images/globaltemp.jpg
Global temperature history graph

~~Resources~~

Resources and Materials

1. Empty plastic soda bottles
2. Water
3. Ice
4. Matches
5. Aluminum Foil
6. Sunny windowsill or desk lamp
7. Globe
8. Black and White paper
9. ~~Poster board~~ graph paper
10. balloons

Technology Intergration

- Sciencespot.net to supplement content and resources
- Bill Nye video library for viewing content on weather and climate
- BrainPop resources on global warming and climate change.
- SMART Board for lesson content and games
- ELMO for projection text during whole class reading and/or discussion.
- TED TAlks Video on solving Global Warming
- Climate.nasa.gov/evidence

Differentiation

- To create entry-points daily for students who are new or have been absent.

- Review of prior lesson for students that were absent
- Students who are new or have been absent can be asked to review the handout from the previous day lesson during the Do Now.
- Students may sit at designated stations with simplified activities from the previous day.
- Students can be partnered with others who were present.
- Graphic organizers will be adapted to appropriate scaffolding.
- Vocabulary Wheel Worksheets will be adapted for appropriate scaffolding.
- Lab Manuals can be assessed based on the work that is present.

Poster board graphs can be assessed based on work done.

- Not ~~penalizing~~ penalized for missing work

- Work side by side the student

Monday

Aim: How do the earths' motions affect climate?

Objectives: Participants will be able to describe the cyclical changes in the earths motions that have affected climate

Instructional Sequence / Plan

Do Now - Diagnostic Quiz (2 TASC-like MCQs)

Mini lesson on the Milankovitch Cycles

Present the ~~climate history~~ temperature history graph from the Scotese.com website

Watch Bill Nye's video on changing seasons and the tilt of the earth

Discuss on the final project that shows both global temperature history and predicts future climate change.

Q & A / exit slip

COVERS →

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Tuesday

Aim: How do earth systems affect climate?

Objective: Participants will will be able to explain earth systems phenomena in terms of climate concepts.

Instructional Sequence / Plan

- Diagnostic Quiz (2 TASC-like MCQ's)
- Mini lesson on geological record, tectonic events, ocean circulation and volcanic activities.
- Mini lab on reflection and absorption relating to global warming and greenhouse gases.
- Lab Report Entry
- Start Part I of the poster-board climate history graph.
- Share Out / Exit Slip

(OVER)

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Wednesday

Aim: What is the difference between weather and climate?

Objective: Participants will compare weather to climate

Instructional Sequence/Plan

- Diagnostic Quiz (2 TASC-like MCQ's)
- Venn diagram comparing weather and climate while identifying over lapping features
- Mini lesson on various forms of weather such as violent storms, drought etc.
- Students will continue on Part II on the climate graph, identifying recent climate phenomena.
- Students Self Assessment/Share Out

Daily Assessment

- Do Now Diagnostic
- Venn diagram: Comparing Weather & climate
- Poster board graph Part II
- Self Assessment Share Out

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Thursday

Aim: What is global climate change?

Objective: Participants will cite evidence of global climate change or the lack thereof.

Instructional Sequences / Plan

- Diagnostic Quiz (2 TASC-like MCQ's)
- Mini lab on glacial melting and ocean rise
- Students will work on their lab manuals
- Students work on Part III of their poster board graph of future climate possibilities.
- ShareOut / Exit Slips

Daily Assessment

- DoNow Diagnostic
- Lab Report Entry
- Poster board graph Part III
- ShareOut
- Exit Slip

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Friday

Aim: What is the human impact on global climate change, and what can we do to help solve the problem?

Objective: Participants will draw conclusions about the human impact on climate change.

Instructional Sequences/Plan

- Diagnostic Quiz (~TAS-like MCQ's)
- Mini lesson on Greenhouse affect
- Watch the TED TALKS Video on Solving global warming
- Students finish up their projects and make presentations

Daily Assessment

- Do Now Diagnostic
- Greenhouse Affect Quiz
- Student's presentation