



FACING THE FUTURE

SOUTH FLORIDA VS. CLIMATE CHANGE

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Curriculum Guide
Grades 9 - 12

Facing the Future | Teacher Guide Grades 9 - 12

This curriculum guide gives students hands-on learning activities connected to the themes, current events, and interviews featured in the documentary **Facing the Future**.

Designed for grades **9–12** and aligned with Florida State Standards for Social Studies, Science, and Civics & Government, these activities let students explore important real-world issues while practicing skills for active civic engagement.

Activities include:

- | | |
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| Lesson 1: | Charted Waters: Data Analysis |
| Lesson 2: | Global Climate Consultants Model Eliciting Activity |
| Lesson 3: | What's Your Number?: Awareness Campaign |
| Lesson 4: | 48 Hours Until Landfall |

This documentary and accompanying support materials are intended for use in a middle school setting and may contain material that could be sensitive for viewers who have experienced the impacts of rising seas firsthand.



Vocabulary List from Facing the Future

| | |
|---|---|
| Adaptation | Adjustments made to systems or communities to reduce harm from climate impacts. |
| Community Resilience | The ability of a community to prepare for, respond to, and recover from challenges like natural disasters. |
| Data Visualization | A graphical representation of information (charts, graphs, maps, tables). |
| Elevation | The height of land above sea level. |
| Evidence-Based Argument | What is beneficial for all or most of a community. |
| Infrastructure | Physical systems and structures (roads, bridges, water systems, power grids) that support a community. |
| Mitigation | Actions taken to reduce the causes or long-term impacts of climate change. |
| Primary Source | An original document or firsthand evidence related to a topic. |
| Projection | A scientific estimate of future conditions based on current data and trends. |
| Quantitative Data | Numerical data that can be measured and analyzed statistically. |
| Resilience | The ability of a community to prepare for, withstand, and recover from disruptions. |
| Sea Level Rise | The increase in the average level of the world's oceans over time. |
| Storm Surge (Sunny-Day Flooding) | An abnormal rise of water generated by a storm, above the predicted tide level. |
| Tidal Flooding | A gathering of citizens, officials, or agencies where community issues are discussed and decisions may be made. |
| Trend | A general direction in which something is changing over time. |
| Vulnerability | The degree to which a population or system is susceptible to harm. |

South Florida Climate Leaders Featured in Facing the Future

Archbold Biological Station

Studies and protects rare ecosystems across nearly 20,000 acres in the Everglades region.

More: <https://www.archbold-station.org/>

The CLEO Institute

A nonpartisan nonprofit dedicated to climate education, advocacy, and community engagement.

More: <https://cleoinstitute.org/>

The Cortada Foundation

Promotes climate awareness and action in South Florida through public art and community-driven projects.

More: <https://cortadafoundation.org/>

The Everglades Foundation

Works to restore and protect America's Everglades through science, advocacy, and education.

More: <https://www.evergladesfoundation.org/>

Florida Department of Environmental Protection – Resilient Florida Program

Provides planning grants and implements the Statewide Resilience Plan to help communities address climate risks through adaptation and mitigation.

More: <https://floridadep.gov/>

Miami Climate Resilience Committee

Advises the City Commission on climate policy, code updates, and waterfront resilience issues.

More: <https://www.miami.gov/My-Government/Boards-Committees/Climate-Resilience-Committee>

Miami-Dade County Board of County Commissioners

The 13 elected commissioners who govern and set policy for Miami-Dade County.

More: <https://www.miamidade.gov/global/government/commission/home.page>

Rosenstiel School of Marine, Atmospheric, and Earth Science

A leading research institution focused on marine, atmospheric, and Earth sciences.

More: <https://www.earth.miami.edu/index.html>

Southeast Florida Regional Climate Change Compact

A collaboration among Broward, Miami-Dade, Monroe, and Palm Beach counties to reduce greenhouse gas emissions, advance adaptation strategies, and strengthen climate resilience.

More: <https://southeastfloridaclimatecompact.org/>

University of Miami Climate Resilience Institute

Advances interdisciplinary research, education, and partnerships to address climate impacts and environmental challenges.

More: <https://resilience.miami.edu/>

Wetland Ecosystems Research and Coastal Sustainability Lab at FIU

Focuses on wetland ecology and coastal sustainability, including urban coastal resilience.

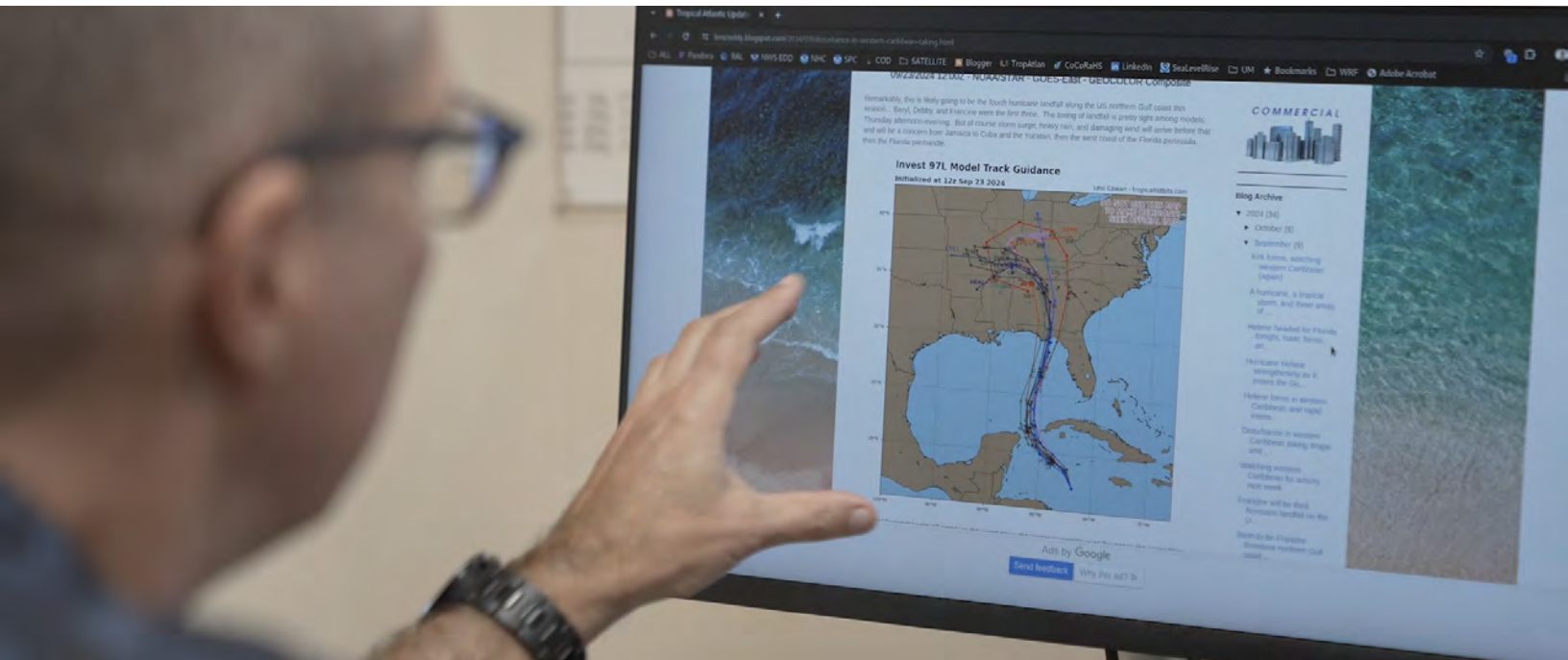
More: <https://wetland.fiu.edu/>

Charting Waters: Data Analysis | Activity

Introduction

Facing the Future presents data charts and tables, giving students a chance to strengthen their analytical skills and learn how to use evidence to support an argument.

In this activity, students will critically examine the charts and tables featured in the documentary. They will analyze what each visual shows, interpret the data, and evaluate how it contributes to understanding the impacts of rising sea levels in Southeast Florida.



Learning Objectives:

- Interpret charts and graphs to identify key trends.
- Evaluate how effectively visual data communicates scientific information.
- Construct a clear, evidence-based argument using scientific data.

Guiding Questions

- What story does this chart or table tell?
- How does the data support or challenge the arguments presented in the documentary?
- Are there patterns or trends you notice, and what might they mean for local communities?
- How could this information influence decisions about climate adaptation and resilience?

Charting Waters: Data Analysis | Activity

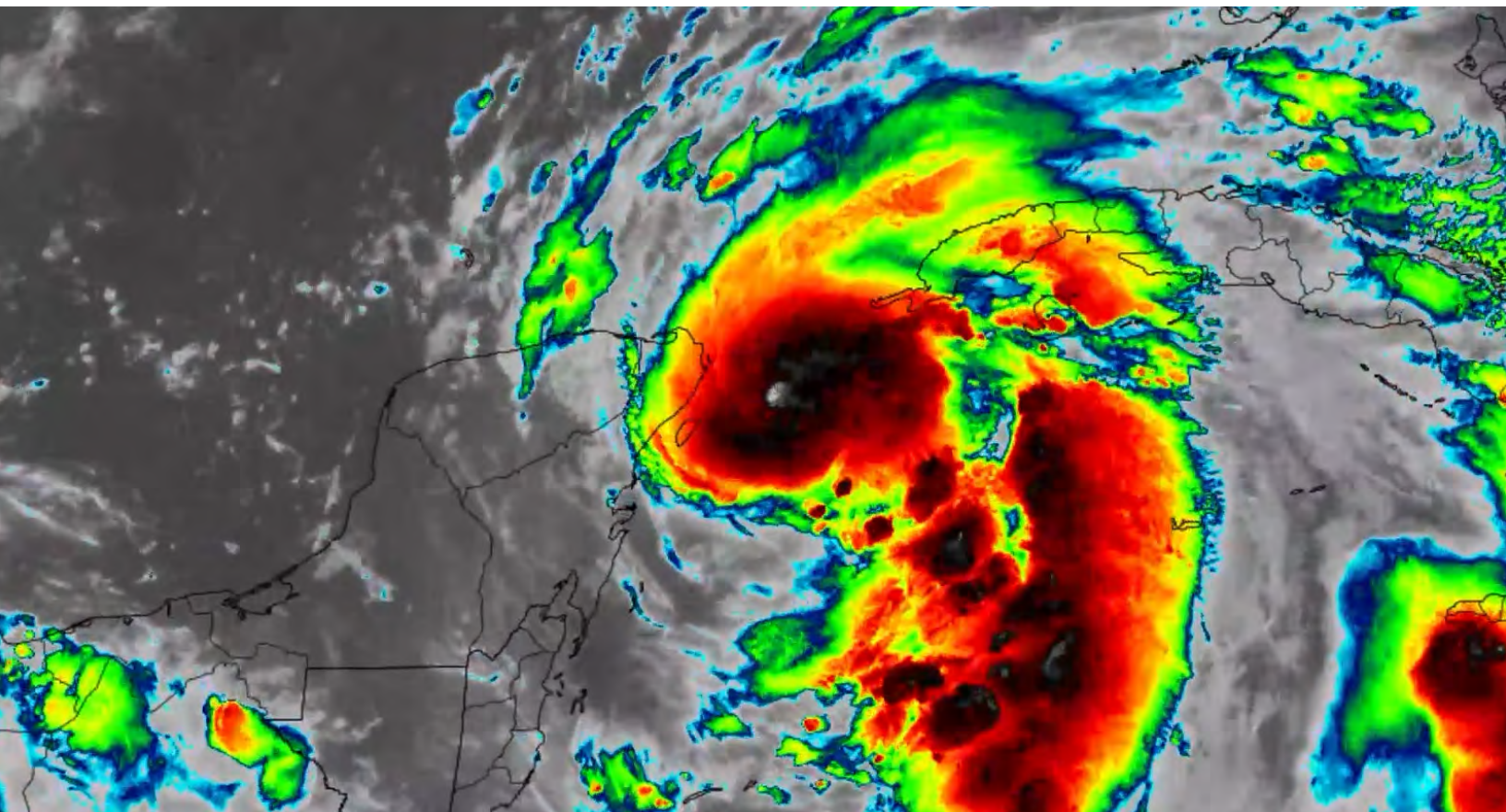
Activity Directions

The charts and graphs featured in Facing the Future provide key insights into rising sea levels in Southeast Florida and contribute to the overall discussion of climate impacts.

Individually or in small groups, students should analyze one chart using the analysis tool handout. After completing their analysis, students will share their findings and look for patterns or trends across the data. Encourage discussion on questions such as:

- **How do the graphs support or conflict with each other?**
- **What story does each visual tell about rising sea levels?**
- **How might different audiences interpret the data differently?**

Finally, students should determine which chart or graph provides the strongest evidence for rising sea levels and present a reasoned argument to support their choice. This activity develops critical thinking, data interpretation, and evidence-based reasoning skills.



Activity Directions

Facing the Future uses charts and tables to illustrate the impacts of rising sea levels in Southeast Florida. In this activity, you will analyze these visuals, interpret the data, and evaluate how it supports the documentary's arguments.

Complete the questions below.

Step 1: Review the Visual

- A. What is the title of the visual?
- B. What type of visual is this?
- C. What is the source of the data? Research the source.
- D. Does the source present any conflicts of interest that might affect the reliability of the data?
- E. What year is the data from?

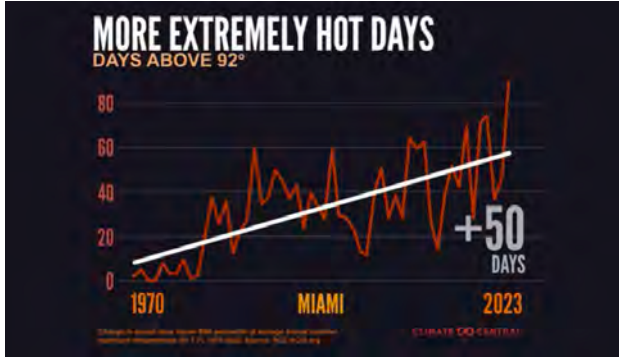
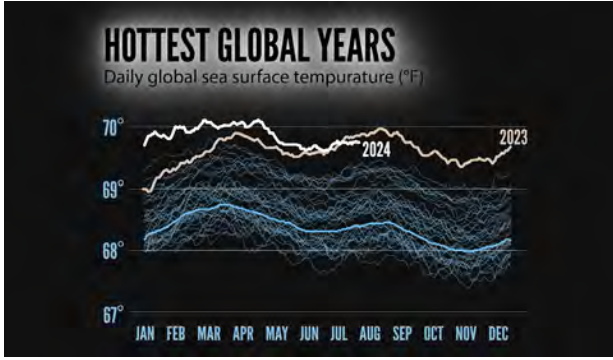
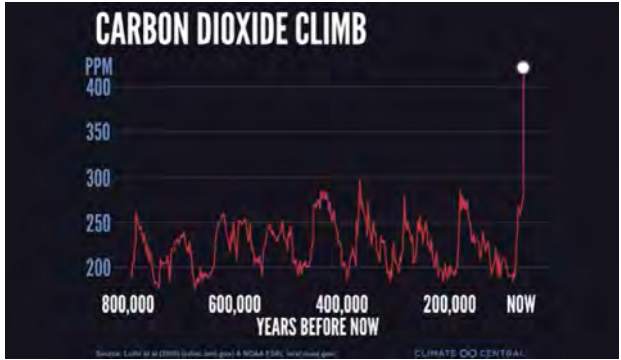
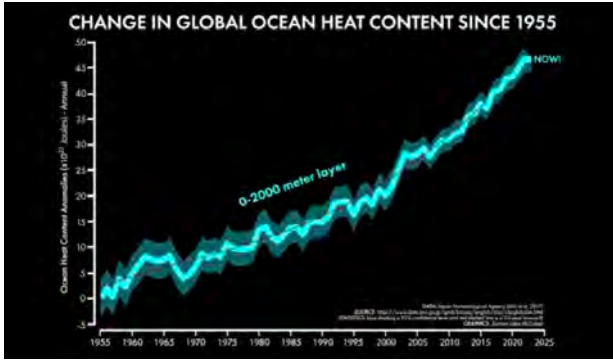
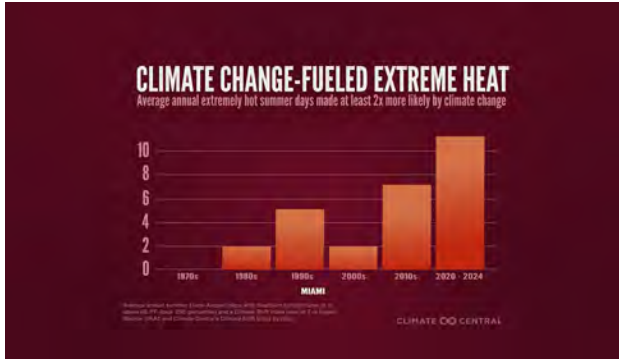
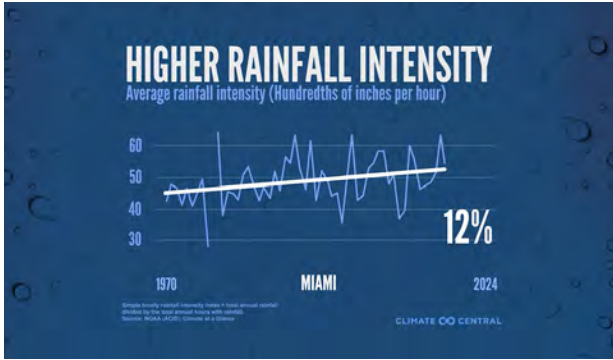
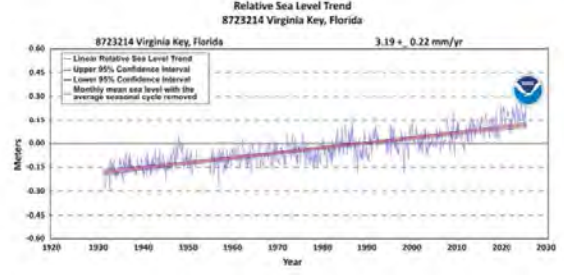
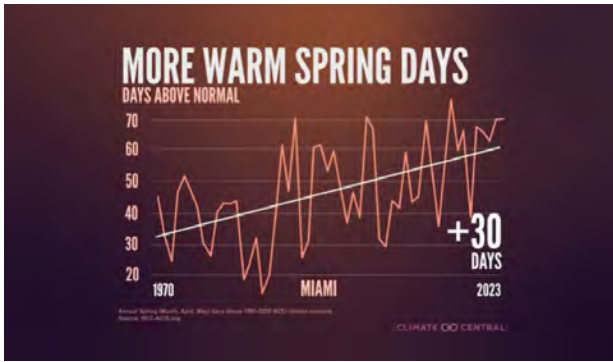
Step 2: Analyze the visual

- F. What does the data show?
- G. What does the data mean?

Step 3: Understanding the Broader Context

- H. How does this visual compare to the themes presented in *Facing the Future*?
- I. How might someone interpret the data in this visual differently?





Alignment to Florida’s State Academic Standards for Science, Social Studies and English Language Arts

SC.912.N.1.1 Explain the importance of curiosity, honesty, openness, and skepticism in science, including the critical review of evidence.

SC.912.E.7.3 Describe how human activities affect Earth systems, including climate change and sea level rise.

SC.912.E.7.4 Analyze how data from experiments, investigations, and modeling can inform predictions and guide environmental decision-making.

SC.912.E.7.9: Cite evidence that the ocean has had a significant influence on climate change by absorbing, storing, and moving heat, carbon, and water.

SS.912.G.2.2: Analyze geographic and environmental issues (like rising sea levels) and their social, economic, and political impacts.

ELA.11-12.C.1.5: Evaluate information from diverse media and formats to determine relevance, credibility, and bias.

Global Climate Consultants | Model Eliciting Activity

Introduction

In **Facing the Future**, Michael Berkowitz from the University of Miami states, "Southeast Florida can lead the country and the world in climate innovation." A resident of Stillwright Point Neighborhood in the Keys also states, "we've had media from Sweden, Germany, France, Great Britain, Ireland, Denmark, and a lot of other countries look at what Monroe County, the Keys are doing to solve this because they are facing issues themselves."

In this activity, students will adopt the perspective of a climate expert in Southeast Florida. Their task is to respond to a request from another country seeking guidance on sea level rise mitigation and adaptation strategies.

Learning Objectives:

Students will:

- **Synthesize various sources of information into a cohesive conclusion that answers a research question.**
- **Draw conclusions and make predictions based on data and historical records.**
- **Write an argument citing evidence.**

Activity Directions

Review the prompt below as a group. Then, follow the steps to complete the task.

Prompt:

Southeast Florida Climate Consultants,

Our country is experiencing challenges with rising sea levels that are very similar to what Southeast Florida faces. We know that your region has been working hard to develop strategies to mitigate flooding, protect communities, and adapt to climates.

As experts from Southeast Florida, we are asking for your guidance. Using your knowledge of local impacts, research, and community solutions, what recommendations would you give our country to address street flooding?

We would particularly like to hear about:

1. An overview of the problem – Explain the key challenges caused by rising sea levels, including social, economic, and environmental impacts.
2. Evidence-based strategies – Describe mitigation and adaptation strategies that have been implemented or proposed in Southeast Florida. Consider infrastructure, urban planning, policy, community engagement, and natural solutions.
3. Lessons learned – What approaches have worked well? What has been difficult? Why?
4. Global application – How could your strategies be adapted to another country facing similar challenges?

With thanks, Community Experts Across the Seas

Step 1: Research

First, review data on Southeast Florida’s sea level rise, flooding, and community impacts. Identify key challenges faced by local communities (e.g., flooding, infrastructure, property impacts, ecosystems).

Use research and quantitative data sources such as:

- Facing the Future
- NOAA Sea Level Rise Viewer, available online.
- Miami–Dade County or Monroe County resilience reports, available online.
- Tide gauge data from the National Oceanic and Atmospheric Administration, available online.

Step 2: Identify Mitigation and Adaptation Strategies

Consider what approaches could be adapted to other countries with similar challenges.

List strategies that Southeast Florida has implemented or is planning, including:

- Coastal infrastructure improvements (levees, seawalls, drainage)
- Land use and zoning changes
- Green infrastructure (mangroves, wetlands, living shorelines)
- Community engagement and education programs

Consider Counterarguments and Evaluate Policies

- Why might a seawall not be the best solution?
- What unintended consequences could adaptation strategies create?
- Which stakeholders might oppose certain policies?

Step 2: Identify Mitigation and Adaptation Strategies

Draft a formal policy brief or advisory report to the requesting country, including citations and data. Include:

- Executive Summary
- Background and Problem Analysis – Explain the local challenges of rising sea levels.
- Data Evidence – Use data, charts, or examples from multiple sources to support your recommendations.
- Recommended Solutions – Highlight mitigation and adaptation methods that have proven effective locally. Be sure to include counterarguments on why other methods are not sustainable solutions.
- Cost and Feasibility
- Global Application

Alignment to Florida’s State Academic Standards for Social Studies, Science, and English Language Arts

SC.912.E.7.3 Describe human impacts on Earth systems, including climate change and rising sea levels.

SC.912.E.7.4 Analyze how data from experiments, investigations, and models can inform predictions and guide environmental decision-making.

SC.912.N.1.1 Explain the importance of skepticism, evidence, and critical review in science.

SC.912.E.7.8 Evaluate strategies for mitigating environmental impacts, including human adaptation to sea level rise.

SC.912.E.7.9 Cite evidence that the ocean has had a significant influence on climate change by absorbing, storing, and moving heat, carbon, and water.

SS.912.G.2.2 Analyze geographic and environmental issues and their social, economic, and political impacts.

SS.912.G.3.5 Examine how local, national, and international actors collaborate to address global environmental challenges.

ELA.9.C.1.3 Write to argue a position, supporting claims using logical reasoning and credible evidence from multiple sources, rebutting counterclaims with relevant evidence, using a logical organizational structure, elaboration, purposeful transitions, and a tone appropriate to the task.

| | | | |
|---|---|--|--|
| <p>Above grade-level accomplishment demonstrated.</p> | <p>The central idea is focused on the task and consistently maintained throughout.</p> <ul style="list-style-type: none"> • Organizational structure strengthens the response and allows for the advancement of the central idea. • Purposeful transitional strategies connect ideas within and among paragraphs and create cohesion. • Effective introduction and conclusion enhance the essay. | <p>Skillful development demonstrates thorough understanding of the topic.</p> <ul style="list-style-type: none"> • Effective elaboration may include original student writing combined with (but may not be limited to) paraphrasing, text evidence, examples, definitions, narrative, and/or rhetorical techniques as appropriate to support the central idea. • Smoothly integrated, relevant evidence from multiple sources lends credibility • Evidence is appropriately cited. | <p>Integration of academic vocabulary strengthens and furthers ideas.</p> <ul style="list-style-type: none"> • Skillful use of varied sentences structure contributes to the fluidity of ideas. • Use of standard English grammar, punctuation, capitalization, and spelling demonstrates consistent command of the communication of ideas. • Tone and/or voice strengthen the overall response. |
| <p>Within the range of grade-level performance.</p> | <p>Central idea is focused on the task and generally maintained throughout.</p> <ul style="list-style-type: none"> • Organizational structure is logical and allows for advancement of the central idea. • Purposeful transitional strategies connect ideas within and among paragraphs. • Sufficient introduction and conclusion contribute to a sense of completeness | <p>Logical development demonstrates topic understanding.</p> <ul style="list-style-type: none"> • Adequate elaboration may include (but may not be limited to) a combination of original student writing with paraphrasing, text evidence, examples, definitions, narrative, and/or rhetorical techniques as appropriate to support the central idea. • Relevant, integrated evidence from multiple sources lends credibility to the exposition. • Evidence is appropriately cited. | <p>Integration of academic vocabulary demonstrates a clear expression of ideas.</p> <ul style="list-style-type: none"> • Sentence structure is varied and demonstrates grade-appropriate language facility. • Use of grammar, punctuation, capitalization, and spelling demonstrates grade-appropriate command of standard English conventions. • Tone and/or voice is appropriate for the overall response. |
| <p>Approaching the range of grade-level performance.</p> | <p>Central idea may be unclear, loosely related or insufficiently sustained within the task.</p> <ul style="list-style-type: none"> • Organizational structure may be repetitive or inconsistent, disrupting the advancement of ideas. • Transitions attempt to connect ideas but may lack purpose and/or variety. • Introduction and conclusion may be present but repetitive, simplistic, or otherwise ineffective. | <p>Development may demonstrate partial or incomplete understanding of the topic.</p> <ul style="list-style-type: none"> • Elaboration may attempt to develop the central idea but may rely heavily on the sources, provide loosely related information, be repetitive or otherwise ineffective. • Evidence may be partially integrated and/or related to the topic but disconnected from the exposition. • Lacks appropriate citations | <p>Vocabulary and word choice may be imprecise or basic, demonstrating partial command of idea expression.</p> <ul style="list-style-type: none"> • Sentence structure may be partially controlled, somewhat simplistic, or lacking grade-appropriate language • Inconsistent use of correct grammar, punctuation, capitalization, and/or spelling may contain multiple distracting errors, demonstrating partial command of standard English conventions. • Tone and/or voice may be inconsistent. • May be grammatically accurate but too brief to demonstrate grade-appropriate command of language skills. |
| <p>Below grade-level performance demonstrated.</p> | <p>Central idea may be absent, ambiguous, or confusing, demonstrating lack of awareness of task.</p> <ul style="list-style-type: none"> • Demonstrates little or no discernible organizational structure. • Transitions may be absent or confusing. • Introduction and conclusion may be unrelated to the response and/or create confusion. • Too brief to demonstrate knowledge of purpose, structure, or task | <ul style="list-style-type: none"> • Response may demonstrate lack of understanding of the topic and/or lack of development. • Elaboration may consist of confusing ideas or demonstrate lack of knowledge of elaborative techniques. • Evidence from sources may be absent, vague, and/or confusing. • Lacks appropriate citations. • Too brief to demonstrate knowledge of elaboration, topic, or sources | <p>Vocabulary and word choice may be vague, unclear, or confusing.</p> <ul style="list-style-type: none"> • Sentence structure may be simplistic or confusing. • Use of grammar, punctuation, capitalization, and/or spelling may contain a density and variety of severe errors, demonstrating lack of command of standard English conventions, often obscuring meaning. • Tone and/or voice may be inappropriate. |

What's Your Number? Awareness Campaign | Activity

Introduction

Art can tell a story and inspire action. **Facing the Future** features Xavier Cortada, an artist and climate activist who engages the public on the topic of rising sea levels. After exploring local elevation and its relationship to sea level rise, students will create an awareness campaign to promote community resilience.

Lesson Objectives:

- **Define elevation and explain its relationship to sea level rise.**
- **Research and accurately identify the elevation of a specific location.**
- **Create an original artwork incorporating elevation data.**
- **Explain how art can influence public awareness and civic engagement.**

Activity Directions

Step 1: Watch Facing the Future

Watch Facing the Future, paying close attention to how artist and climate activist Xavier Cortada draws attention to the effects of rising sea levels (12:55–15:52 and 43:58–47:58). You might start a discussion about the segments by asking:

- Why does Xavier Cortada use numbers (elevation) in his artwork?
- How does connecting art to personal data make the issue more meaningful?
- Why might people respond differently to art than to charts or graphs?
- How does this project connect science to civic engagement?

Step 2: Research Elevation

Use free online tools or maps to determine the elevation of a familiar location in the community. Use the NOAA Sea Level Rise Viewer available online to compare this location to the larger region and for different scenarios like high tide flooding.

Step 3: Awareness Campaign

Using the elevation number as inspiration, design an awareness campaign using platforms like social media and video-sharing sites.

- How could this campaign raise awareness in our school?
- How could we share it with local leaders or community members?
- How does art contribute to public dialogue?
- Now that we know our numbers, what is the community doing about it?

Alignment to Florida's State Academic Standards for Social Studies

SC.6.E.7.6 Differentiate between weather and climate.

SC.7.E.6.6 Identify human impact on Earth's systems.

VA.68.O.3.1 Create art that communicates personal ideas and experiences.

VA.68.R.2.1 Explain how art reflects culture or community

VA.68.S.1.4 Use art-making to communicate socially relevant themes.

VA.68.S.3.2 Demonstrate awareness of art's potential to influence thought and action.

| Category | 4 | 3 | 2 | 1 |
|----------------------------------|---|--|--|--|
| Brainstorming - Problems | Students identify more than 4 reasonable, insightful barriers/problems that need to change. | Students identify at least 4 reasonable, insightful barriers/problems that need to change. | Students identify at least 3 reasonable, insightful barriers/problems that need to change. | Students identify fewer than 3 reasonable, insightful barriers/problems that need to change. |
| Brainstorming - Solutions | Students identify more than 4 reasonable, insightful possible solutions/strategies to encourage change. | Students identify at least 4 reasonable, insightful possible solutions/strategies to encourage change. | Students identify at least 3 reasonable, insightful possible solutions/strategies to encourage change. | Students identify fewer than 3 reasonable, insightful possible solutions/strategies to encourage change. |
| Research/Statistical Data | Students include 4 or more high-quality examples or pieces of data to support their campaign. | Students include at least 3 high-quality examples or pieces of data to support their campaign. | Students include at least 2 high-quality examples or pieces of data to support their campaign. | Students include fewer than 2 high-quality examples or pieces of data to support their campaign. |
| Campaign/Product | Students create an original, accurate and interesting product that adequately addresses the issue. | Students create an accurate product that adequately addresses the issue. | Students create an accurate product but it does not adequately address the issue. | The product is not accurate. |
| Sources - Citation | Information in all source citation is correct and in the format assigned. | Information in all source citations is correct but there are minor errors in formatting. | Information in almost all source citations is correct AND there are minor errors in formatting. | The information is often incorrect OR there are major errors in formatting. |



48 Hours Until Landfall | Activity

Introduction

As seen in Facing the Future, Florida has experienced many powerful hurricanes in recent history. Students will examine hurricane tracking, why certain communities are more vulnerable, and how individuals and local governments prepare for storms. They will evaluate preparedness strategies and create a Hurricane Preparedness Plan for a specific community.

Lesson Objectives:

- **Analyze factors that increase community vulnerability**
- **Evaluate emergency preparedness strategies**
- **Develop a realistic hurricane preparedness plan**
- **Justify preparedness decisions using scientific and civic reasoning**

Activity Directions

Step 1: Watch Facing the Future

Begin by watching Facing the Future, paying particular attention to the tracking and analysis of weather patterns taking place at the University of Miami (21:15–24:00).

Step 2: Research

Then, present the following scenario: a Category 4 hurricane is projected to make landfall near your community in 48 hours. Forecast models show a potential storm surge of 8–12 feet. Power outages could last several days.

- What would you do first?
- Who makes evacuation decisions?
- What resources would you need?
- Use the National Oceanic and Atmospheric Administration (NOAA) Sea Level Rise Viewer to assess who is most at risk in your community.

Step 3: Create a Hurricane Preparedness Plan

Research local and statewide preparedness plans to evaluate the following questions. Then create a school-wide plan to be shared with the school community.

Alignment to Florida's State Academic Standards for Social Studies

SC.912.E.7.6 Differentiate between weather and climate.

SC.912.E.7.3 Identify human impact on Earth's systems.

SC.912.N.1.1 Use evidence and reasoning in scientific decision-making.

SS.912.CG.2.3 Analyze government processes in responding to public issues

SS.912.G.2.2 Analyze environmental issues and social/economic impacts.