



GeoCivics Lesson: *Hurricanes in the Virgin Islands*

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Teacher(s): Cindy James Maynard	Unit Title: GeoCivics Lesson Title: Hurricanes in the Virgin Islands	Grade Level: 8
Notes: This lesson may take several days to complete.		
Pre-existing Knowledge: N/A		
Overview of Content: “A tropical cyclone is a rotating low-pressure weather system that has organized thunderstorms but no fronts (a boundary separating two air masses of different densities). Tropical cyclones with maximum sustained surface winds of less than 39 miles per hour (mph) are called tropical depressions. Those with maximum sustained winds of 39 mph or higher are called tropical storms. When a storm's maximum sustained winds reach 74 mph, it is called a hurricane. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating, or category, based on a hurricane's maximum sustained winds. The higher the category, the greater the hurricane's potential for property damage. Hurricanes originate in the Atlantic basin, which includes the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico, the eastern North Pacific Ocean, and, less frequently, the central North Pacific Ocean. A six-year rotating list of names, updated and maintained by the World Meteorological Organization, is used to identify these storms. "Hurricane Season" begins on June 1 and ends on November 30, although hurricanes can, and have, occurred outside of this time frame. NOAA's National Hurricane Center predicts and tracks these massive storm systems, which occur, on average, 12 times a year in the Atlantic basin.” -- NOAA		
Purpose: <i>What students will learn:</i> Students will learn what hurricanes are, the impact they have, and what that means for the Virgin Islands' topography over time. They will learn about and create a preparedness plan for their home and communities.		

National & State Social Studies Standard(s):**National:**

- PEOPLE, PLACES, AND ENVIRONMENTS: The study of people, places, and environments enables us to understand the relationship between human populations and the physical world

US Virgin Islands: N/A**National & State Geography Standard(s):****National:**

- Standard 4: The physical and human characteristics of places
- Standard 7: The physical processes that shape the patterns of Earth's surface.

US Virgin Islands:

- VISA.SS.9.CS.GEO.3 Examine the environment and topography of the Virgin Islands, and how it has influenced the islands cultural and environmental characteristics through political and economic policies.

ELA Standards: (To teach/review and support emergent multilinguals (EMLs) English language development):

- CCSS.ELA-Literacy.RH.6-8.1
 - Cite specific textual evidence to support analysis of primary and secondary sources.
- CCSS.ELA-Literacy.RH.6-8.7
 - Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

ISTE Student Standard:

- 1.3.a Effective Research Strategies: Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
- 1.6.a Choose Platforms or Tools: Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

Language Functions:

- **Inquiry/Seeking Information:** Students use language to observe and explore the environment, acquire information, inquire.
- **Summarizing and Infoming:** Students use language to identify, report or describe information.

Culturally Responsive Lesson Strategies:

- **VOICE:** Lesson/Assignment allows places for students to work together cooperatively or share their learning experience.
- **ACCESS:** Lesson/Activity communicates ideas in several different ways. - There are several ways for students to express their learning.
- **CONNECTIONS:** Lesson/Activity incorporates real-life connection and representations from various cultures and life experiences. More than one real-life connection is made or represented and mostly from the experiences of the dominant culture.
- **HIGHER ORDER THINKING:** Lesson/Assignment provides avenues for students to engage in higher cognitive processing, applying learning to big-picture analysis and creative applications for

learning. - Some higher order applications and creative thinking are included, but only in one predetermined way.

Objective(s):

- Students will read and annotate a level text on climate change to elicit information on responding to climate change in the Virgin Islands.
- Students will analyze information from an informational video to deduct how climate change affects the Virgin Islands.
- Students will describe how the ideas they gather from the article and video will help them to have a deep understanding of how the climate in their region can affect their livelihood.

SIOP

SIOP Elements		
Preparation	Scaffolding	Grouping Option
Adapting content	Modeling	Whole class
Linking to background	Guided practice	Small groups
Linking to past learning	Independent practice	Partners
Strategies used	Comprehensible input	Independent
Integrating Processes	Application	Assessment
Reading	Hands-On	Individual
Writing	Meaningful	Group
Speaking	Linked to objectives	Written
Listening	Promotes engagement	Oral

Evidence of Mastery

Formative - Student groups share a graphic organizer they have completed that explains types of hurricane impacts: wind, storm surge, flooding, etc. and their related impacts on the environment, humans, and their communities, and will present these to the class and participate in a discussion,, with the teacher making note of their information as a formative assessment of student learning. Students will then use the lesson vocabulary words to write a three to five sentence paragraph describing the overall impact that a hurricane could have on the US Virgin Islands, and will turn these in for the teacher to use as an additional formative assessment.

Summative - Students will create a preparedness plan for hurricanes on the US Virgin Islands. Then, using their choice of media tools, a poster, Google slides, PowerPoint, etc., they will prepare a method to promote safety information and share this out with the class. The teacher will use the Preparedness Plan Rubric below to assess students' learning with a score of 10 or higher indicating mastery.

Preparedness Plan Rubric

Levels of Accomplishment	Criteria	Points
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Exceeds Expectations	Preparedness plan provides very strong and accurate research-based and documented information explaining how people can stay safe and survive hurricanes on the US Virgin Islands by explaining many different options for how to stay safe and secure when a hurricane is coming. The presentation includes many visuals and detailed and well written information to promote safety and it is presented in a way that gives the audience confidence in their ability to carry out the plan.	12 + pts.
Meets Expectations	Preparedness plan provides accurate research-based information explaining how people can stay safe and survive hurricanes on the US Virgin Islands by preparing beforehand a safe and secure place to stay when a hurricane is coming. The information given includes several options that people can do to remain safe and include visuals as well as written information to promote safety and is presented in a way that helps the audience feel capable of carrying out the plan.	10 pts.
Approaches Expectations	Preparedness plan provides a little research-based information to explain how people can stay safe and survive hurricanes on the US Virgin Islands but lacks a full explanation of how to prepare a safe and secure place to stay when a hurricane is coming. The information given does not provide multiple options of things people can do to remain safe. It includes few visuals to support the written information and is presented in a way that encourages the audience to follow the plan, but lacks information to help them feel capable of carrying out the plan.	8 pts.
Fails to Meet Expectations	Preparedness plan does not provide true research-based information to explain how people can stay safe and survive hurricanes on the US Virgin Islands. It lacks a full explanation of how to prepare a safe and secure place to stay when a hurricane is coming and gives only one option for what people can do to remain safe. It includes no visuals to support the written information, but lacks information to encourage the audience to carry out the plan.	0 - 5 pts.

Key vocabulary:

- **Hurricane:** Hurricanes are strong storms that start in the ocean and have winds of at least 74 miles an hour.
- **Storm surge:** The rise in seawater level caused solely by a storm.

Materials:

- Video: *Hurricanes 101/ National Geographic (2.57 min.) (Link in Sources below)*
- Map of US Virgin Islands (in Lesson Materials Document)
- Online article: *Hurricanes:* (Link in Sources below)

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| <ul style="list-style-type: none"> ● Hurricane categories (Saffir-Simpson Hurricane Wind Scale 1 - 5)
https://www.weather.gov/hgx/tropical_scale ● Evacuation: Leaving an area due to unsafe conditions. ● Hurricane Warning: Hurricane conditions with sustained winds of 74 mph or higher are expected within a specified area in the next 36 hours. ● Hurricane Watch: Hurricane conditions with sustained winds of 74 mph or higher are possible within a specified area in the next 48 hours. ● Sea Surface Temperature (SST): is the ocean temperature close to the surface. ● US Territories: In the United States, a territory is any extent of region under the sovereign jurisdiction of the federal government of the United States, including all waters (around islands or continental tracts). | <ul style="list-style-type: none"> ● Student access to computers/laptops and WiFi to conduct research (at least one per group) ● Student notebooks for recording research and notes ● <i>Hurricane Simulation</i> Website with <i>How Does a Hurricane Form?</i> Video: (Link in Sources below) ● Teacher access to a computer and projection device to project a website to the class ● Copies of Hurricane Research Graphic Organizer - one per student (In Lesson Materials Document) ● Graphic Organizer Information Sources: (Links in Sources below) ● Video: <i>Island of Puerto Rico 'destroyed' by Hurricane Maria</i> (3.06 min.) (Link in Sources below) ● Sites for student research on How to Prepare for a Hurricane in the Virgin Islands: (Links in Sources below) ● Student access to media and materials needed to promote their safety information based on their choice: posters, access to Google slides/ access to PowerPoint, etc ● Preparedness Plan Rubric (located above in the lesson plan) |
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Sources:

- Video: *Hurricanes 101/ National Geographic*: <https://www.youtube.com/watch?v=LIXVikDkyTg>
- Map of the US Virgin Islands: [File:United States Virgin Islands in United States \(US48\).svg - Wikimedia Commons](File:United States Virgin Islands in United States (US48).svg - Wikimedia Commons)
- Online article: *Hurricanes: National Geographic article on hurricanes*,
- *Hurricane Simulation* Website with *How Does a Hurricane Form?* Video: [simulation](#); [Hurricane Simulation | NOAA SciJinks – All About Weather](#)
- Graphic Organizer Information Sources: [Florida Fish & Wildlife Foundation](#); [Science & Society](#); [National Hurricane Center](#)
- Video - [Island of Puerto Rico 'destroyed' by Hurricane Maria](#)
- Sites for student research on How to Prepare for a Hurricane in the Virgin Islands:
 - [Proper Emergency Kit Essential to Hurricane Preparedness - Government of the United States Virgin Islands](#)
 - <https://fema-community-files.s3.amazonaws.com/hazard-information-sheets/Hurricane-English.pdf>
 - [Preparing for a Hurricane or Other Tropical Storm](#)

- Website: [Active Tropical Cyclones](#) (hurricanes) - tracking movement

Engage

Teacher Will:

1. Ask students if they have ever been in a big weather or natural event. In a hurricane? If yes, have them share what it was like, by asking: *What did they hear? What kind of event was it? How did they feel? Did anything happen to their house or yard, or in their community? What did you and your family do during the hurricane?*
2. Show the video: *Hurricanes 101*: [hurricane video](#) and discuss with students what they observed in the video, and if possible, tie this into what students have just shared.
3. Inform students they will be exploring the impact of hurricanes on the US Virgin Islands. Show the Islands on the Map of the [U.S. Virgin Islands](#) (in Lesson Materials Document) and explain that the Virgin Islands are a part of the U.S., called territories.

Students Will:

1. Participate in class discussion sharing out their experience of big weather or natural events and how it impacted them.
(Grouping: Whole class) (Preparation: Linking to background) (Integrating Processes: Listening/Speaking)
2. Watch the hurricane video and make observations, and discuss these with the teacher and class and talk about how what they saw in the video connected to what they have experienced.
(Grouping: Whole class) (Integrating Processes: Listening/Speaking) (Preparation: Linking to background)
3. Listen to and reflect on the teacher's information about exploring hurricanes in the US Virgin Islands, and view and make note of the location of the Virgin Islands on the map shown.
(Grouping: Whole class) (Integrating Processes: Listening/Speaking)

Explore

Teacher Will:

IQ #1 - *What are hurricanes, and in what ways can a hurricane impact both the natural environment and human infrastructure in the Virgin Islands?*

1. Present Inquiry Question #1 to the class and engage the class in a discussion of the question, by first asking students what they think hurricanes are and how they form.
2. Put students in groups, strategically grouping ELLs/SPED and Gifted students to provide language and learning support as needed, and have each group conduct research on what a hurricane is by reading the online article

Students Will:

1. Participate in class discussion of Inquiry Question #1.
(Grouping: Whole class)(Preparation: Linking to past learning).
2. Work together in groups to research hurricanes by using the provided article and discussion and writing down the information read to answer the question about what a hurricane is.

[National Geographic article on hurricanes](#), and discussing and writing down in their notebooks the information read about what a hurricane is.

3. Now that students understand the basics of hurricanes, the teacher will show the [Hurricane Simulation website with the How Does a Hurricane Form? video: simulation](#) and explore and discuss the relationship between sea surface temperatures (SST) and hurricane strength and movement, and have students add notes about this into their notebooks.

**You may discuss that due to climate change, global sea surface temperatures have risen; warm water serves as 'fuel' for hurricanes leading to more intense and frequent storms.*

4. Introduce the following vocabulary words and discuss the meanings with the class and have students write these down in their notebooks: **Hurricane, storm surge, hurricane categories, evacuation, hurricane warning, hurricane watch, sea surface temperature, U.S Territories.** Ask students if they recognize any of the vocabulary definitions in the videos watched and make and discuss connections made. *If needed, the teacher can show [Hurricanes 101 video](#) again to reinforce.*

(NOTE) To support ELLs/SPED students if needed, the teacher can write the vocabulary words and definitions on the board and have the students copy them to write them in their own notebooks.

5. Pass out copies of the [Hurricane Research Graphic Organizer](#) (in the Lesson Materials document), and have students work in groups to fill in the categories on the organizer using information from their research and using the websites below. *Categories include:* type of hurricane impact (i.e., wind, storm surge, flooding, etc.), and related impacts on the environment and humans, and their communities. *Use sites such as:*
 - a. [Florida Fish & Wildlife Foundation](#)
 - b. [Science & Society](#)
 - c. [National Hurricane Center](#) -

(Grouping: Small groups) (Integrating Processes: Reading/Writing/ Listening/Speaking) (Application: Hands-on/Meaningful/Promotes engagement)

3. Watch the video shown by the teacher and participate in a class discussion sharing out what they learned about the relationship between sea surface temperature and hurricane strength and movement, and write down the information in their notebooks

(Grouping: Whole class) (Integrating Processes: Listening/Speaking/ Reading)

4. Participate in a class discussion about the vocabulary words and videos watched, and write down the words and definitions in their notebooks.

(Grouping: Whole Class) (Integrating Processes: Listening/Speaking/ Writing/Reading) (Application: Meaningful/Promotes engagement)

5. Work in their groups using their notes taken on prior research and conduct further research using provided sites and to complete the graphic organizer.

(Grouping: Small Groups) (Integrating Processes: Reading/Writing/Listening/Speaking) (Application: Hands-on/Meaningful/Promotes engagement)

(NOTE) Clicking on the education tab at top will give specific topics.

Explain

Teacher Will:

1. When done, each group will share their graphic organizer with the class and the teacher will take notes on the students' share out for use as a formative assessment of student learning.
2. The teacher will then lead the students in a discussion to summarize their research findings.
3. Then the teacher will tell students to Integrate the lesson vocabulary words and write a three to five sentence paragraph describing the overall impact a hurricane could have on an island will then have students turn these in for the teacher to use as an additional formative assessment of their learning.

Students Will:

1. Work as a group to share their graphic organizers with the class.
(Assessment: Group/Oral)
2. Participate in a class discussion summarizing their research findings.
(Grouping: Whole Class) (Integrating Processes: Listening/Speaking) (Application: Meaningful) (Preparation: Linking to past learning)
3. Integrating lesson vocabulary words, students write a three to five sentence paragraph describing the overall impact a hurricane could have on an island.
(Grouping: Independent) (Application: Hands-on/Meaningful/Promotes engagement) (Preparation: Linking to past learning) (Assessment: Individual/Written)

Elaborate

Teacher Will:

IQ #2 - What can be done to reduce the impact of a hurricane on people and the environment?

1. Share Inquiry Question #2 with the class and ask students to brainstorm with a partner what they think could be done to help protect people and the environment from the impact of hurricanes.
2. Show the video [Island of Puerto Rico destroyed by Hurricane Maria](#) and discuss it with the class.
3. Have students conduct research individually (or with a partner if language or learning support is needed) on how to prepare for a hurricane in the Virgin Islands using the listed sites below (and any others that you feel are appropriate). Students should take notes from their research regarding preparedness

Students Will:

1. Brainstorm with a partner what they think could be done to help protect people and the environment from the impact of hurricanes
(Grouping: Partners) (Preparation: Linking to background)
2. Watch the video of Hurricane Maria and participate in a class discussion.
(Grouping: Whole class) (Integrating Processes: Listening/Speaking)
3. Individually (or with partners if needed) research and take notes on how to prepare for a hurricane in the Virgin Islands using sites provided by the teacher.
(Grouping: Independent or Partners)

<p>strategies for their home, community, pets, etc.</p> <ol style="list-style-type: none"> https://www.vi.gov/proper-emergency-kit-essential-to-hurricane-preparedness/ https://fema-community-files.s3.amazonaws.com/hazard-information-sheets/Hurricane-English.pdf https://www.cdc.gov/disasters/hurricanes/before.html 	<p>(Integrating processes: Reading/Writing) (Application: Hands-on/Meaningful/Promotes engagement)</p>
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Evaluate

<p>Teacher Will:</p> <ol style="list-style-type: none"> Share with students that they will individually create a hurricane preparedness plan for the US Virgin Islands using the information they have recorded from their research. The teacher will then share out the <u>Preparedness Plan Rubric</u> and talk about the criteria used to grade their plans and presentations of them. Then have students choose the media they will use to promote safety information (video, poster, Google slides/PowerPoint presentation, etc.) and be given time to work on their plan and create their method to share out their plan. Students will then share their media with the class, and the teacher will use the Preparedness Plan Rubric to assess student learning with a score of 10 or higher indicating mastery. 	<p>Students Will:</p> <ol style="list-style-type: none"> Listen and reflect on what they are to do to create a hurricane preparedness plan for the US Virgin Islands. (Grouping: Whole class/Independent) (Preparation: Linking to past learning) Use their choice of media to prepare a method to promote safety information by creating a video, poster, Google slides, PowerPoint presentation, or other means of their choice. (Grouping: Independent) (Application: Hands-on/Meaningful/Promotes engagement/Linked to Objectives) Share their Preparedness Plan using the media method they have chosen and share it with the class. (Grouping: Whole Class/Independent) (Integrating Processes: Listening/Speaking/Reading) (Application: Hands-on/Meaningful/Promotes engagement)
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Extensions: After presenting their preparedness plans with the class, the teacher could arrange for the students to share them out with other students and faculty at the school. They might also be given an opportunity to create an online presentation for people in their community by creating a YouTube video or Blog or create newspaper articles to share out the information with others who could benefit from this information.