**Extreme Weather Jigsaw**

This cooperative lesson is designed for students in grades 4-6. Students will use the jigsaw strategy to learn about four types of extreme weather. Students will become an expert on one extreme weather event and then share their knowledge with their peers to collect information about all four types of extreme weather. Finally, students will use their notes and knowledge to write an opinion paragraph detailing the extreme weather event they find the most concerning.

**Standards:**

**Next Generation Science Standards:**

* **5th Grade**
  + **5-ESS2-1** – Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
  + **5-ESS3-1** – Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.
* **Middle School**
  + **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-ESS3-2** – Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

**C3 Framework for Social Studies State Standards:**

* **Grades 3-5**
  + **D2.Geo.10.3-5** – Explain why environmental characteristics vary among different world regions.
* **Grades 6-8**
  + **D2.Geo.10-6-8** – Analyze the ways in which cultural and environmental characteristics vary among various regions of the world.

**Common Core State Standards:**

* **4th Grade**
  + **CCSS.ELA-Literacy.RI.4.2** – Determine the main idea of a text and explain how it is supported by key details; summarize the text.
  + **CCSS.ELA-Literacy.RI.4.3** – Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
* **5th Grade**
  + **CCSS.ELA-Literacy.RI.5.2** – Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
  + **CCSS.ELA-Literacy.RI.5.3** – Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
* **Grades 6-8**
  + **CCSS.ELA-Literacy.RST.6-8.2** – Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
  + **CCSS.ELA-Literacy.WHST.6-8-1** – Write arguments focused on *discipline-specific content*.
  + **CCSS.ELA-Literacy.WHST.6-8.10** – Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

**Objectives:**

* Students will be able to describe four major extreme weather events: hurricanes, tornadoes, earthquakes, and tsunamis.
* Students will be able to explain the atmospheric and weather conditions related to these extreme weather events, the effects of each, and how humans can prepare for, engage with, or respond to each type of disaster.

**Lesson Duration:** approximately 45-80 minutes

**Materials:**

* The Building Blocks of Geography series, Atmosphere and Weather
* Scratch paper
* Pencils
* Marking the Text Guide (1 per student and/or project a copy so students can see)
* Extreme Weather Articles (1 per student, see Differentiation Considerations)
  + Hurricanes Detailed or Simplified Article
  + Tornadoes Detailed or Simplified Article
  + Earthquakes Detailed or Simplified Article
  + Tsunamis Detailed or Simplified Article
* Note-Taking Guide
* Opinion Writing Worksheet

**Requisite Prior Knowledge:**

* Before engaging in this lesson, it would be beneficial for students to have read the Building Blocks of Atmosphere and Weather book. In this book, students learn about differences in the atmosphere that affect our weather and review different types of extreme weather. This will provide students with the background knowledge they need to be successful in this lesson.
* If students have not completed a jigsaw task before, it might be helpful to review the procedures prior to engaging in the lesson.

**Assessments:**

* Notes and text marking from students’ articles
* Note-taking guide
* Opinion writing

**Vocabulary:**

* Atmosphere – the air that surrounds Earth
* Hurricane – a storm with violent wind and usually very heavy rain; a tropical cyclone often accompanied by violent thunderstorms
* Tornado – an extremely violent whirlwind extending down from a mass of dark clouds creating a funnel of whirling air that moves over the land in a narrow and destructive path
* Earthquake – a shaking or sliding of the ground caused by the sudden movements of masses of rock along fault lines
* Tsunami – a series of oceanic waves caused by a submarine earthquake or a volcanic eruption

**Differentiation Considerations:**

* This lesson involves a jigsaw task in which students work in two groups to determine the main ideas of a lengthy text. In a jigsaw, students first work in an Expert Group to read and take notes on their assigned sections of a text. Next, they transition to their second group, the Jigsaw Group, where they relay the information they learned. They then take notes from their peers about the sections of the text they did not read. Because this task involves two groups, consider being strategic with your grouping. It can be helpful to make sure each Expert Group contains a range of learning abilities as well as a student who can be the group leader.
* Considering using the Simplified Articles for particular students as they are written at a lower Lexile level than the Detailed Articles.
* Determine students’ Jigsaw and Expert Groups prior to engaging in this lesson. Consider creating homogenous groups based on students’ reading abilities. You can create a group for each leveled article to create 8 total groups. Consider pulling struggling readers to a small group during the initial reading and note-taking phase of the jigsaw for additional support.

**Lesson and Instruction:**

|  |  |
| --- | --- |
| **Lesson Components and Time Guidelines** | **Teacher Actions** |
| **Introduction/Hook**  Approximately 8-10 minutes | Have students use scratch paper to complete a “brain dump.” During a brain dump, students are encouraged to write anything they think about or wonder related to a particular subject. The goal of this is to activate students’ prior knowledge.  Provide students 2 minutes to brain dump everything they know and/or wonder about extreme weather. Challenge students to write the entire time.  Have students share what they brain dumped with a neighbor before calling on a few volunteers to share out. Consider picking specific students’ responses to address any misconceptions. |
| **Direct Instruction and Modeling**  Approximately 10-15 minutes | Before splitting into pre-determined groups to complete the collaborative note-taking portion of this lesson, students will independently read and annotate their text. Explain to students that annotating a text is like marking it. Strong readers annotate their texts to help them process and keep track of important information.  Provide students a copy of the Marking the Text Guide or project it so all students can see. Review the meaning of each annotation symbol before passing out students’ pre-assigned articles. See the Differentiation Consideration section of this lesson plan for information regarding leveled texts and homogenous grouping.  Provide time for students to independently read and mark their texts. Circulate the room to provide support or consider pulling a small group of struggling readers. Encourage students who finish before others to either re-read the text to get more information and gain a deeper understanding of their extreme weather event, or to begin considering what they would like to contribute to their Expert Group during the Application Activity portion of this lesson. |
| **Application Activity**  Approximately 25-35 minutes | Once students have finished reading and annotating their articles, transition to Expert Groups. There should be 4 Expert Groups, one for each extreme weather event: hurricanes, tornadoes, earthquakes, and tsunamis. If you would like, you can split students into 8 Expert Groups, with two groups per extreme weather event instead. This might be beneficial if you have a large number of students or if you used both the simplified and detailed versions of the articles with your students.  In Expert Groups, students will be responsible for sharing the information they gained from the article and integrating it with information shared by their group members.  After students complete their work in their Expert Group, they will transition to their Jigsaw Group. This group should contain one person from each Expert Group so all sections of the reading are represented.  Explain the following Jigsaw Task procedures to students:   1. Review your text markings and identify at least one thing per section to share with your Expert Group. 2. As an Expert Group, share what you marked in the text. Determine 2-3 bullet points that best summarize each section and add them to your note-taking guide. 3. Transition to your Jigsaw Group to share the main ideas and bullet points associated with the sections your Expert Group read. In addition, add notes to your guide about the sections your Jigsaw Group read. 4. Use this time to ask questions to the experts in your Jigsaw Group! You will need to know about each type of extreme weather for the next portion of this lesson. |
| **Independent Application and Demonstration of Learning**  Approximately 10-15 minutes | Have students transition to the independent work setting where they will write an opinion-based response to the question “based on what you know about hurricanes, tornadoes, earthquakes, and tsunamis, which extreme weather event do you believe to be the most concerning?” Students will need to provide strong reasoning supported by examples to strengthen their written response.  Depending on the needs of your learners, consider allowing them to use the note-taking guide they completed during this lesson for support. |
| **Closure**  Approximately 2-5 minutes | Remind students that today they were able to collaborate with two groups to first become an expert on an extreme weather event, and second, to share their knowledge with others. In addition, they wrote an opinion piece detailing which extreme weather event is most concerning to them and why. |

**Next Steps and Reflection:**

|  |  |
| --- | --- |
| What went well? |  |
| What changes might be beneficial? |  |
| Reteaching needs |  |
| Extension needs |  |