Earth and Human Activity

3rd Grade Unit

Core Idea ESS3 Earth and Human Activity

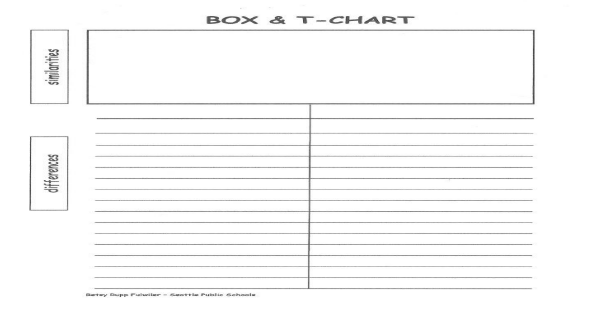
- By the end of grade 2. Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that communities can prepare for and respond to these events.
- By the end of grade 5. A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions, severe weather, floods, coastal erosion). Humans cannot eliminate natural hazards but can take steps to reduce their impacts.

3rd Grade: 3-ESS3 Earth and Human Activity

3-ESS3-1: Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.
Guiding Question: How can engineering designs reduce the impact of weather-related hazards?

Teacher Directions:

1. Read ***Circle Boy: Bringing Black Elk's Storytelling to Life*** to students.
2. After reading the book to students, brainstorm about how the ways of life of the people in the 'Circle Boy' story are different than the communities/lifestyles of people in the US today. As a class, create a Box & T-Chart to compare and contrast. This information will be used as background knowledge for the menu. For example, a teepee vs. a brick home would provide different types of protection from a violent storm.
3. As a formative assessment, have student groups create a mind map with both words and drawings using the following criteria:
    1. The center circle of the mind map reads: Communities/Lifestyles
    2. The first two lines leaving the center circle read:
    a. Native Americans in the time of Black Elk b. Current Lifestyles in the US.
    3. For both 2a and 2b, there should be at least 5-10 bubbles with words and related drawings (The number can be used to differentiate instruction).
    Examples for Native Americans in the time of Black Elk:
    Rode horses/Lived in Teepees/Lived off the plants and animals in the area/ Weather or natural disaster information transferred via tribe, story telling, painting, Winter Counts, etc. (See Resources)
    Examples for Current Lifestyles in the US:
    Drive Cars with gas/Live in houses with heat and air conditioning/Get food from the grocery store that come from all over the world/Travel with cars, trucks, trains, airplanes/Weather and natural disaster information transferred via TV, Internet, wide range of people, etc. (See Resources)
4. Complete the menu on the next page.



Menu Directions:
All students or student groups will complete the middle Engineering for Everyone! and two choice squares. In other words, students may choose any tic-tac-toe where the line goes through the middle. These three squares can be completed in any order or at the same time, but in the final project must be integrated in terms of knowledge, understanding, application, and synthesis for the student's summative presentation to the class.

Menu:

<table>
<tr>
<td>Greeting Card
Make a computer greeting card that 'Circle Boy' might have created that introduces people to the Circles of Power. Be sure to mention the Circles of Power that are weather-related.</td>
<td>Pop-Up Book
Construct a pop-up book that shows the weather-related hazards that Black Elk and his tribe may have faced. Research how they may have survived these hazards and include that information in your book.</td>
<td>Comic Strip
Create a comic strip of a super hero who saves people from hazardous weather. Describe how he or she is similar to 'Circle Boy'. How did your superhero know the weather was coming and how to save people?</td>
</tr>
<tr>
<td>Timeline
Create a timeline of engineering innovations that help protect people from hazardous weather. Include 5-10 innovations all from different decades.</td>
<td>Engineering for Everyone!
The 'Everyone!' square is for all students.
Directions: All students will complete this assignment by integrating it with their chosen assignment.
Rationale:
The 'Everyone!' square is designed to integrate technology or engineering at this grade level and then build from grades 3-5.
Everyone! Assignment for 3rd grade:
Create an engineering design that reduces the impacts of a weather-related hazard. Make a claim about your design.</td>
<td>Analysis Chart:
Complete the following chart by answering these questions:
1. Does your community value safety from weather-related hazards? Why or Why not?
2. What are the characteristics of a community that protects citizens from weather disasters?
3. What hazardous weather patterns are common in your area?
4. How can you summarize your ideas by combining 1, 2, and 3?
<table><tr><td>1. Value</td><td>2. Characteristics</td></tr><tr><td>3. Patterns</td><td>4. Summary</td></tr></table></td>
</tr>
<tr>
<td>Technology
Create a technology that would help warn people of impending weather-related hazards.</td>
<td>Environmental Slide Show
Create a slide show on the computer illustrating 5-10 ways that your community can stay safe from weather-related hazards.</td>
<td>Skit
Write a skit about a group of students that warns others about hazardous weather. How would they get the word out? What hazards would they warn people about? Explain?</td>
</tr>
</table>

Project and Presentation Rubric for Three Menu Items

Directions: Please use this rubric throughout the menu project and self-grade prior to your presentation. Rubrics are to be left on desks and checked regularly by the students and teacher. The 'See Teacher' category can be used when students need scaffolding and support for success by the teacher providing interventions.

Rubric:

Categories:	**4**	**3**	**2**	**See Teacher**
Presentation	The presentation was completed on time and the information was correct.	The presentation was completed on time and contains two of the three menu options.	The presentation was not complete and some information was not correct.	Students need to meet with the teacher.
Writing Task (Middle menu option for 'Everyone' to complete)	The task was completed correctly.	The task was completed and nearly correct.	The task was incomplete and contained some errors.	Students need to meet with the teacher.
Directions for the Menu were Followed	The directions were followed completely and correctly.	The directions were not followed completely or they were not followed correctly.	The directions were not followed completely and they were not followed correctly.	Students need to meet with the teacher.
Rubric Self-Evaluation	The self-evaluation of this rubric was complete and correct.	The self-evaluation was either not complete or not correct.	The self-evaluation was neither complete nor correct.	Students can meet with the teacher for specific questions.
Synthesis of Three Menu Items	The synthesis of three menu items was complete and correct.	Two out of three menu choice syntheses were completed. One was partially complete.	Two out of three menu choice syntheses were completed. One was missing.	Students need to meet with the teacher.
Menu Choices	The three menu choices were complete.	Two menu choices were complete.	Only one menu choice was complete.	Students need to meet with the teacher.
Collaboration	Collaborative work was completed equally and respectfully.	The amount of work was equal, but there was a need to improve collaboration.	Your peer or peers completed more of the work (unequal).	There was unequal input for much of the project despite teacher input.

Integration:

1. Social Studies: Other cultures that live with or near hazards.
2. Technology: Change in technology over time for weather-related warning systems.
3. Language Arts:
    - Books about other cultures that have been affected by hazardous weather.
    - Books about weather-related hazards.
4. Art from Native American cultures depicting weather.
5. Music from Native American cultures that can be played while students work.
6. Language: Words from Native American Languages that are weather-related.
7. STEM: Engineers Without Borders: http://www.ewb-usa.org/

Factors or Strategies with High Effect Size/Positive Effect on Achievement (Hattie, 2009; Wiggins, 2012)

High effect size strategies/factors include, but are not limited to:
Graphic Organizers; Formative Assessment; Feedback; Metacognitive Strategies/ Student self-assessment/self-grading by using project rubrics; Acceleration; Self-questioning by students; Student-centered teaching; Cooperative learning

Resources:

Lakota:
http://wintercounts.si.edu/
http://www.carnegiemnh.org/online/indians/lakota/
Current:
http://www.epa.gov/oar/airpolldata.html
http://waterdata.usgs.gov/nwis
http://www.epa.gov/data/
http://criticalhabitat.fws.gov/crithab/

References:

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas (2012). Retrieved on September 9, 2012 from, http://www.nap.edu/catalog.php?record_id=13165

Hattie, J. A. C., (2009). *Visible Learning*. Milton Park, Australia: Routledge.

Next Generation Science Standards. (2013). Retrieved on March, 12, 2014 from, http://www.nextgenscience.org/next-generation-science-standards

Wiggins, G. (2012). What works in education – Hattie's list of the greatest effects and why it works. Retrieved on July 15, 2014 from, http://grantwiggins.wordpress.com/2012/01/07/what-works-in-education-hatties-list-of-the-greatest-effects-and-why-it-matters/