

Weather
Aligned Lesson 2

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<p>Related Unit: Weather and Climate ESS2-1, ESS2-2</p>	<p>Lesson Length: 6-9 days</p>
<p>Library of Congress Primary Sources</p>	<p>Materials/Supplies/Resources</p>
<div style="text-align: center;">  <p>Earthquake picture</p> </div> <ul style="list-style-type: none"> ● https://www.loc.gov/resource/cph.3a21575/ Hurricane picture ● https://www.loc.gov/item/ggb2005019464/ Tornado picture 	<ul style="list-style-type: none"> ● 1 cardboard base (approximately 25 cm by 25 cm) ● 30 straws ● 100 paper clips (one box) ● 20 straight pins ● 2 meters of string ● Sandbags- 250 grams ● Sand ● Popsicle sticks ● Cereal boxes ● Clay (to simulate cement)
<p>Enduring Understandings</p>	<p>Essential Question(s)</p>
<p>A variety of hazards result from natural processes; humans cannot eliminate hazards but can reduce their impacts. (ESS3-1)</p>	<p>How can humans reduce the impact of natural disasters? (ESS3-1)</p>
<p style="text-align: center;">Transfer Goals</p>	
<ul style="list-style-type: none"> ● Asking questions (for science) and defining problems (for engineering) ● Developing and using models ● Planning and carrying out investigations 	
<p style="text-align: center;">Learning Objectives</p>	

I CAN STATEMENTS

- I can describe and identify, including evidence about:
 - The given weather-related hazard (e.g., heavy rain or snow, strong winds, lightning, flooding along river banks).
 - Problems caused by the weather-related hazard (e.g., heavy rains cause flooding, lightning causes fires).
- How the proposed solution addresses the problem (e.g., dams and levees are designed to control flooding, lightning rods reduce the chance of fires) [note: mechanisms are limited to simple observable relationships that rely on logical reasoning].

Engage: How can I get students interested in this?

- Describe how the teacher will capture students' interest.
- Include what kind of questions the students can ask themselves to further engage with the material?
- Identify the Primary Source(s) that can be used to observe and make connections.
- Approximate how long this portion of the lesson should take.

Teacher will begin by showing the Library of Congress picture from above. (since this is a continuation of the previous lesson teacher will direct students to consider the following questions.

1. What part of the structure seems weak?
2. What materials are used in the picture?
3. If there were people there, where could they go to be safe?

*This should take 1 hour

* Science Engineering Practice and Cross Cutting Concepts in this section

Explore: What tasks/questions can I offer to help students puzzle through this?

- Describe what hands-on/minds-on activities students will be doing.
- Include some probing questions teachers could possibly pose to encourage and/or focus students' on exploring and gathering more information related to the essential question(s).
- Approximate how long this portion of the lesson should take.

Students will watch video on YouTube <https://www.youtube.com/watch?v=QVZExL00MWA>

As student are watching the video students will be taking notes on the type of weather hazard and their impact on the earth and people in it. (see attachment in folder).

Students will watch the following videos on each hazard and take notes in the chart provided.

<https://www.youtube.com/watch?v=xKubdY2mHXc> Hurricanes

<https://www.youtube.com/watch?v=-s3UwOq1P1E> Tornadoes

https://www.youtube.com/watch?v=AArne-wh_Uc Earthquakes

Students can also use the following websites to further their research.

<https://www.ready.gov/kids/know-the-facts>

Students will add to their chart to expand their learning.

Questions to consider: Questions will be answered in students science notebooks. Use as a summative or as a guide to re-teaching previous material.

1. How does the climate in a particular area determine the type of weather disaster that that place has? (this information will be gained from the previous lesson in this unit)
2. Think of 2 regions that you have studied, can the same precautions be taken when building a home in one region versus another? Explain, why or why not.
3. How are homes in different regions similar and different?

*students may play game in site that tests their knowledge on each disaster.

As a class teacher will show the following website <http://www.concretethinker.com/solutions/Disaster-Resistance.aspx>

- Teacher will read important information such as types of materials that are used to prevent certain hazards.
- Teacher will discuss terms and give examples of each that students may not know such as: concrete, separation wall, exterior wall, asphalt shingles, siding, panels, bricks. (teacher could also go on google to show pictures of each of the mentioned items.
- Other items that need to be included: houses on stilts, boards to board up windows, tornado shelter, sandbags.

*It may be a good idea to have students go around their building to locate such structures from the activity so they have a visual understanding as well.

* 3-D learning in this section

*This could take up to 1-2 days.

Explain: How can I help students make sense of their observations?

- Have the students reflect upon their experiences and the Primary Source(s).
- Have the students write down questions they wondered about and want more information on.
- Include questions* and/or strategies teachers can utilize to help students connect their experiences to the essential question(s) and enduring understanding(s).
- Approximate how long this portion of the lesson should take.

***Questions should be of higher order, to encourage student explanations and support of claims and/or evidence.**

Using their knowledge from the previous activity students will look at the pictures from the Library of Congress and consider the following questions.

1. Are there other materials that could be used that may have prevented the amount of destruction? If so, what?
2. If you were able to fix one thing on the structure, what would it be and why?
3. What determines the type of materials used in a natural disaster?

* Using the pictures in file to ask the following questions.

1. How does each protective item from above important to each structure?
2. What protective items do you see on these homes or buildings?
3. What other items could be used as well or in place of to make the structure safer?

*These questions can be answered in their science notebooks or given as an exit ticket to be used as a summative.

* Science Engineering Practice and Cross Cutting Concepts in this section

Extend/Elaborate: How can my students apply their new knowledge to other situations?

- Describe how the students will apply their new knowledge to new or similar situations.
- Include how the teacher can help the students make relevant connections to their observations, address misconceptions, and extend students' learning.
- Approximate how long this portion of the lesson should take.

Elaborate

-Each student will be responsible for researching a weather related hazard and provide pictures/explanations for design solutions to that particular weather hazard. Students will turn in a paper about their topic. Students may use the websites from above to research.

-Topics could include:

- tornadoes
- thunderstorms
- flooding
- winter storms
- hurricanes
- earthquakes

Extend

* Students can create a safety plan for a given hazard that could occur if they were not in a safe place. i.e. home, building.

Questions to consider:

1. How would you get in touch with missing family members?
2. Where would you meet?
3. What if there was a fire also in your hazard, how would you handle that?
4. What if your neighborhood is being evacuated?

Teacher could use the fact sheets in the folder to help students who may need differentiation. see website for additional fact sheets on hazards. <https://www.fema.gov/media-library/assets/documents/34288>

* 3-D learning occurs

*This could take up to 2-3 days.

Evaluate: How can I help my students self-evaluate and reflect on the learning?

- Identify how students and the teacher can assess understanding.
- Describe how the lesson activities can help students demonstrate achievement of the learning objectives.
- Include examples (or descriptions) of evidence related to each learning objective.
- Approximate how long this portion of the lesson should take.

- Students will use the knowledge based on the region they were assigned to create a structure that could sustain the natural hazard for their region.
- Students will be given time to discuss within their group the kid friendly, classroom appropriate materials that they will need.
- Students will provide teacher with list (this could be used to determine understanding of region/natural disaster). or teacher may have students work together to bring in materials.
- Students will be given 3-4 days to build their structure. Rubric (in folder) could be used to score structure. To test structure see below for other option.

*possible testing options

(note: Natural hazard suggestions below can be changed depending on your region and or student interest. Fact sheet website and website on each hazard is provided again..

<https://www.ready.gov/kids/know-the-facts>

<https://www.fema.gov/media-library/assets/documents/34288>

Build a small platform to test the structure- i.e.

1. Tornado- a blow drier, or high powered fan could be used to test structure
2. Hurricane- same as above with a way to add water
3. Earthquake- create an earthquake shake table for the structure to go on top.

After conducting the experiment students will complete the exit ticket answering the following questions.

1. What materials were useful to help your structure make it through the experiment?
2. What materials could you have used instead?
3. What materials could be used in real life to reduce the impact of the natural hazard that you created?

*This part of the lesson could take 3-4 days.