Water Cycle Lesson: Extreme Weather

Water Cycle Unit, Lesson 4 of 4

Created By	Grades	Subjects	Duration
Mallory Swafford	6th, 7th, 8th	Science	≅ 90 minutes

Lesson Overview

Essential Questions	• How have humans caused climate change? • How have humans impacted the water cycle? • What can humans do to mitigate the effects of climate change on the water cycle?
Learning Outcomes	Students will be able to: • Describe how humans have caused climate change. • Describe how humans have impacted the water cycle. • Create a proposal to mitigate the effects of climate change on the water cycle in their area.
Summary	In this lesson, students learn about extreme weather, create an infographic, and educate others on the knowledge gained from this unit. **Inquire:** Students watch videos to understand why the weather is becoming more extreme. **Investigate:** Students create an infographic about extreme weather impacts in their area. **Inspire:** Students educate others on the knowledge gained from this unit.

Instructions

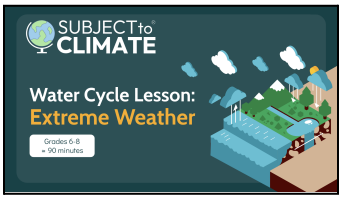
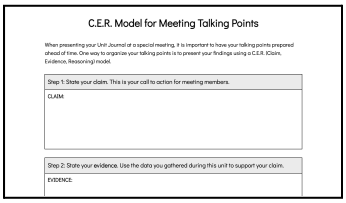
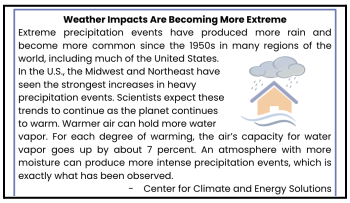
Inquire
≅ 30 minutes
	• Students think-pair-share
	  ○ What type of extreme weather is most likely to affect your area?
	  ○ How do you know?
	• As a class, students watch a video about the difference between weather and climate and reflect on what they learned.
	• Students watch a video about extreme weather and discuss the following comprehension questions:
	  ○ Based on the videos, what are the key differences between weather and climate?
	  ○ What examples illustrate how they differ in terms of time, scale, and predictability?
	  ○ Based on the video, what evidence suggests that weather events are becoming more extreme?
	  ○ How do these trends relate to changes in the Earth's climate system?

Investigate
≅ 30 minutes
	• Students determine which type of weather extremes are most likely to affect their area. It may be beneficial for teachers to discuss with students and confirm which weather extremes are most likely to affect their area.
	• Students research the projections:
	  ○ Students can view flood and drought projections here or here.
	  ○ Students can view fire trends here.

	○ Students can view hurricane projections here. ○ All of the above may be researched here. ○ Students may also complete their own research on weather extremes in their area to assist them in the Investigate section of the lesson. This video can support selecting credible sources. ● Students create an infographic about extreme weather in their area, outlining the following questions: ○ Why are weather events becoming more extreme? ○ What extreme weather is most likely to impact their area? ○ Who is most likely to be impacted by extreme weather? Why? ○ How can your community mitigate or adapt to the impacts of extreme weather? ● Students review the infographic steps: ○ Students review the information learned throughout the lesson. ○ Students determine why weather is becoming more extreme. ○ Students determine who is most likely to be impacted by extreme weather in their area and why that is the case. ○ Students determine how their community can mitigate or adapt to the impacts of extreme weather. ○ Students create their infographics. A sample infographic can be found in the Teacher Document.
Inspire ≅ **30 minutes**	● Students gather the materials from this unit and reflect on the impact of sharing the information collected in the following projects: ○ Water cycle and climate change prompts ○ Heat island mitigation proposal ○ Cause and effect diagram for deforestation, erosion, and climate change ○ Local extreme weather impact infographic ● Students write a paragraph reflection on the whole unit. Prompts can include specific learning and a question for further exploration. This can be used as a formative assessment. ● Students create a gallery walk of their materials. Students walk around and view each other's creations. ○ Students discuss how best to educate the public. ○ As a whole group, the class and teacher decide how best to share their information and create a plan. ● Students brainstorm ways to share their materials using guiding questions in the Teacher Slideshow. ● Students share their learning in a way they feel is most impactful. Students are encouraged to come up with their ideas and the following are suggestions to prompt brainstorming: ○ Invite other classes for a gallery walk. ○ Research a local official and email them. This sample email can be used for scaffolding support. ○ Organize a community night by inviting parents, community members, community leaders, and others to participate in a gallery walk of the students' materials. This sample flier can be used to help create an invitation. Students can stand next to their displays to explain their learning.

	○ Take a group of students to present at a school board meeting, a town hall event, a county hall event, or another local meeting. The Student Document can support students in organizing their thoughts and talking points in a C.E.R. model.

Accompanying Materials

Teacher Slideshow	Student Document	Teacher Document
		

Teaching Tips

Suggestions	• The Investigate and Inspire sections can be completed on separate days or class periods, or extended. • Since this is the last lesson in the unit, students should be encouraged to share their overall learning in a way they feel is most impactful. Consider the following suggestions to prompt brainstorming: ○ Invite other classes for a gallery walk. ○ Research a local official and email them. A sample email is included in the Teacher Document. ○ Organize a community night by inviting parents, community members, community leaders, and others to participate in a gallery walk of the students' materials. A sample flier in the Teacher Document can be used to help create an invitation. Students can stand next to their displays to explain their learning. ○ A group of students can present at a school board meeting, a town hall event, a county hall event, or another local meeting. The Student Document can help students organize their thoughts and talking points with the C.E.R. model.
Prerequisites	• This is lesson 4 of 4 in our 6th-8th grade Water Cycle Unit. • Teachers need to determine how to choose the best course of action for sharing student learning. Options include the following: ○ Class vote ○ Teacher predetermines based on their best judgment ○ Student panel is created ○ Different groups choose different courses of action
Differentiation	• Students may use the Emotions Board in the Teacher Document for emotional vocabulary support. • The writing activity can be extended or scaffolded based on classroom level and student needs. Teachers can determine specific prompts and requirements for students to demonstrate learning.

	• Teachers can provide several templates for infographics or examples for students to model. • Students can use their materials from all four lessons to create one main display reflecting their learning over the whole unit. This can be individual or in partners.

Learning Standards

Primary Standards
Next Generation Science Standards (NGSS) PS, LS, ESS, ETS
MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
Supporting Standards
Common Core State Standards - ELA
CCSS.ELA-LITERACY.W.6.1 Write arguments to support claims with clear reasons and relevant evidence.
CCSS.ELA-LITERACY.W.7.1 Write arguments to support claims with clear reasons and relevant evidence.
CCSS.ELA-LITERACY.W.8.1 Write arguments to support claims with clear reasons and relevant evidence.
CCSS.ELA-LITERACY.W.6.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
CCSS.ELA-LITERACY.W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
CCSS.ELA-LITERACY.W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.