

Student Tools for Emergency Planning (STEP) Program

Supplemental Hazard Lesson: Floods
Instructor Guide



FEMA







STEP SUPPLEMENTAL HAZARD LESSON: FLOODS



The STEP Floods Supplemental Hazard Lesson will help students to:

- Learn what causes flooding and why floods can be so dangerous
- Understand how watches and warnings can help keep them safe
- Understand what kind of damage flooding can cause

Time: (30 min)

Key Messages 	<ul style="list-style-type: none">• Flooding can happen in many different ways, such as during heavy rain, when rivers overflow their banks, and when large ocean waves come onshore.• Some people are more at risk for flooding than others depending on where they live, such as low-lying areas and are as prone to hurricanes.• Pay attention to weather watches and warnings to learn if flooding is imminent and to stay safe.• Stay out of flooded areas because just 6 inches of moving water can knock you down, and 12 inches of moving water can sweep your vehicle away.
Skills 	<ul style="list-style-type: none">• English• Math• Writing• Preparedness• Identification• Real World Problem Solving
Activities 	<ul style="list-style-type: none">• A Forecast for Floods podcast• Flood discussion and Qs/As• Flooding math activity
Materials 	<ul style="list-style-type: none">• Internet to stream or download podcast• Copies of podcast script and math activity• Pencils and crayons, colored pencils, or markers for each student

FLOODS LESSON

This lesson takes a closer look at flood emergencies. Flooding can occur anywhere, but certain areas of the United States are more susceptible to major flooding events than others. These activities will help students better understand flooding and what to do if a flood happens in their area.



Safety Tip: *Discussing disasters can trigger a strong emotional response in some students who have experienced a flood. Let the students know that it's normal to feel anxious or stressed out sometimes and that everyone reacts differently to stressful situations. Suggest they talk to parents or other trusted adults if they are feeling upset. See page 7 of the STEP Instructor Guide for advice on safeguarding students as well as the book list on page 42 for resources on emotional resilience.*

Activity 1: Podcast: A Forecast for Floods

Instructor Script: *Flooding is when a lot of water overflows onto land that is normally dry. It is the most common natural weather event. Today we're going to learn more about what causes flooding and what to do if flooding happens near you.*

First, we're going to listen to a podcast about a class that takes a field trip to the local TV station to learn about weather from the meteorologist, Sandy Smith. The two students in the podcast are named Lily and Oliver. As you listen to the podcast, follow along with the printout. Make sure you listen carefully because every once in a while the printout is missing an important word. Write it in when you hear it.

Teaching Tip: **Having students fill in missing words can help them focus on the podcast and improve their listening skills. You may need to stop the podcast momentarily to allow students time to write the word.**

Action: Hand out print copies of the activity or have students complete the PDF on their devices. Play the podcast audio file.

Discussion Questions

Instructor Script: *The podcast gave us an introduction to how floods happen and how to stay safe. Let's talk a little more about this.*

Action: Begin a general group discussion on flooding, starting with local floods.



QUESTIONS	POTENTIAL ANSWERS
Do you remember floods we've had near us? What did you do?	<p>Responses vary by location, but flooding can happen in every U.S. state and territory.</p> <p>We turned around when we saw the street was flooded.</p> <p>We moved some of our things that were valuable to the second floor in case flood waters came in the house.</p> <p>We made sure we had enough bottled water, food, and batteries in case we couldn't go out and lost electricity.</p>
What are some different kinds of weather that can lead to flooding?	<p>Heavy rain</p> <p>Thunderstorms</p> <p>Hurricanes</p>
When a lot of rain falls at once it can lead to a sudden flood called a flash flood. What do you think you should do if you hear a flash flood warning?	<p>Stay inside or move to higher ground.</p> <p>Don't walk or ride in a car if roads are flooding.</p>
What are some things that you can do to prepare in case of flooding?	<p>Build an emergency kit with items that you will need if you have to evacuate quickly.</p> <p>Make a family communication plan.</p> <p>Tell an adult if you hear a flood warning on the TV or radio.</p> <p>Help your family move important items to an upper floor.</p> <p>Your parents may want to talk to their insurance agent about flood insurance so they can be prepared in case there is damage to the home. They can also visit www.floodsmart.gov to find out more.</p>
What are some reasons to stay out of flood waters?	<p>Just 6 inches of moving water can knock you down, and 12 inches of moving water can sweep your vehicle away.</p> <p>Downed electrical wires can be under the water and can lead to dangerous electric shocks.</p> <p>Flood water can contain germs that might make you sick.</p>
What is the difference between a flood watch and a flood warning?	<p>A flood watch alerts you to be prepared because a lot of rain is forecasted. It does not mean flooding will occur, but it is possible.</p> <p>A flood warning is issued when flooding is going to happen very soon or is already happening.</p>

Activity 2: Water, Water Everywhere Math Activity

Instructor Script: *This next activity will help you learn a little more about big floods that have happened. It also includes some math word problems about floods as well.*



Action: Hand out print copies of the activity or have students complete the PDF on their devices.

STEP SUPPLEMENTAL HAZARD LESSON

FLOODS



A Forecast for Floods Listening Activity

WORD BANK

Deep
Weather
Emergency kit
Flooding
Prepared
Flood
Warning

Oliver: Hi! My name is Oliver. I'm so excited that my class is visiting a TV station today to meet the meteorologist. That's someone who studies the science of _____.

Meteorologist: Hi everyone. My name is Sandy Smith. It's so good to see your class on a beautiful, sunny day. My job is to look ahead to see what the weather will be like tomorrow and throughout the week. This is called forecasting. Speaking of tomorrow, it looks like it won't be nearly as nice as it is today. We have a lot of rain in the forecast, and that can lead to flooding.

No matter where you live, you could experience a _____. Flooding can happen in many ways, such as during heavy rain, when rivers overflow their banks, and when large ocean waves come onshore. Amazing as it sounds, only 6 inches of flood water can knock you down, and 12 inches can cause a car to float away.

Oliver: My mom always says, "Turn around. Don't drown," when we see a lot of water on the road.

Meteorologist: That's exactly what you should do. It's hard to tell how _____ water is just by looking at it. It's always best to turn around and find another way to get to where you're going.

Now, how do we know if there's going to be a flood so we can be _____?

Lily: I heard a flood warning when you were doing the weather once.

Meteorologist: Yes, that's part of the answer. A flood _____ is issued when flooding is about to happen or already happening. We put out what's called a flood watch when we have a lot of rain in the forecast, and it could lead to flooding. You can hear these alerts on TV, the radio, and as text or emergency messages on your phone.

There are things you can do to stay safe before, during, and after a flood. Make sure you have an _____ you can grab if you need to leave your house quickly. Also have a family communication plan so you know a safe place to meet if you aren't all home to leave at the same time.

Floods do a lot of damage to houses and other buildings. Your parents may need to talk to their insurance agent about flood insurance so they can be prepared in case there is damage to the home. They can also visit www.floodsmart.gov to find out more.

During a flood, make sure you don't walk or swim through the water. You are not a fish! Remember that fast-moving water that is only halfway up to your knees can make you fall.

Another important thing to remember is be sure not to touch anything electrical if it's wet or if you are standing in water, because you could get a dangerous shock from it. Also, if you've been in flooded areas avoid touching your face, especially if you haven't washed your hands. The water could be contaminated with germs.

OK, class. That's all we have time for today. Remember to stay alert tomorrow in case there is _____.

Lily: And don't forget to take your umbrella to school!



STEP SUPPLEMENTAL HAZARD LESSON

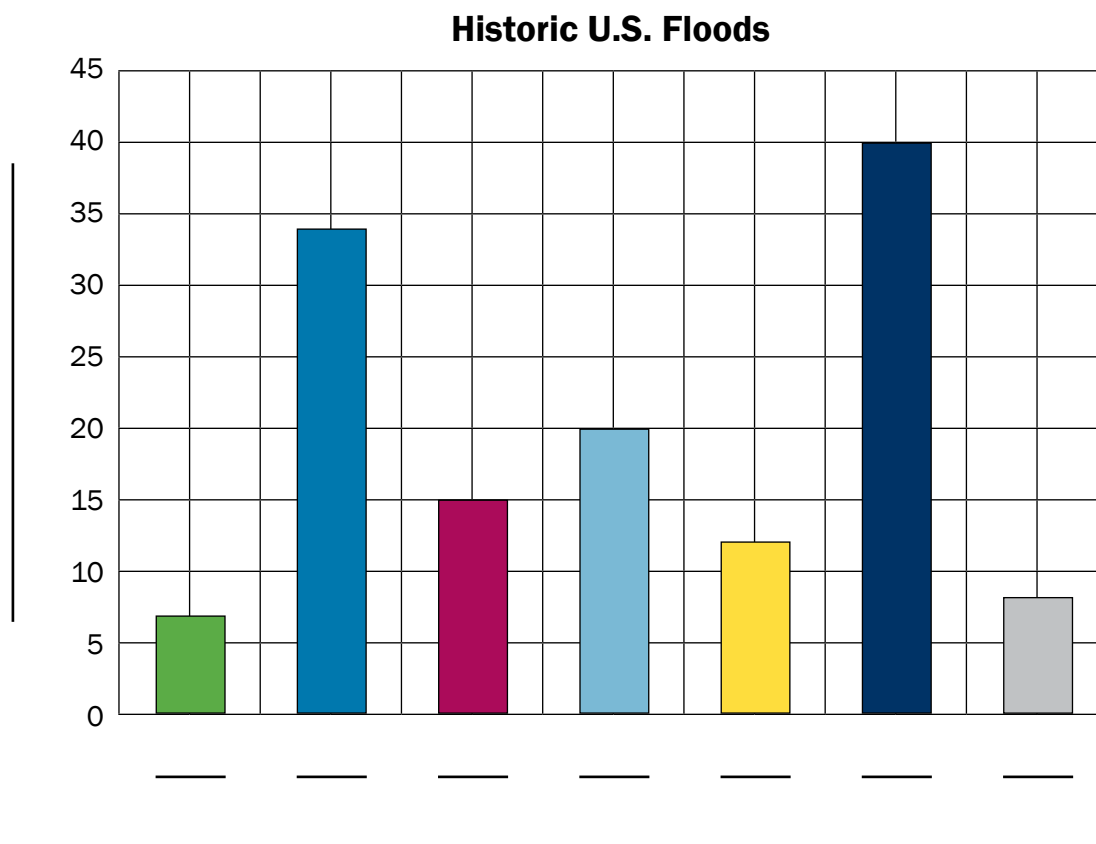
FLOODS



Water, Water Everywhere Math Activity

Directions: This activity includes a bar graph on big floods that happened throughout the U.S., as well as several word problems to complete. Read about the floods in the descriptions below the graph. Then read each problem carefully and follow the instructions.

1. Label the bar graph with the letters that show which bars represent each flood event. Then label the x and y axes.



A. In 1972, Rapid City, South Dakota, and areas around it received 15 inches of rain in just a few hours. The area includes Mt. Rushmore, where the faces of four U.S. presidents are carved into rock. This large amount of rain caused creeks and lakes to overflow. When a dam broke, the flood caused dozens of cars to pile on top of each other as they were picked up by fast-moving water. Not much more than 15 inches of rain usually falls in an entire year in this area.

B. Johnstown, Pennsylvania, has experienced two huge floods. One took place in 1889, when a rainstorm funneled 7 inches of rain into the narrow valley surrounding the town, causing the dam to burst. A massive wall of water 35 feet high tore through the town.

C. Ninety-eight years later, Johnstown's dams couldn't hold up in another large storm. A thunderstorm over the area wouldn't budge, dumping almost 12 inches of rain in just 24 hours in 1987.

D. After 8 inches of rain fell in a day and a half in 1964 on the Blackfeet Indian Reservation in Montana, rushing water caused two nearby dams to collapse. Melting snow made the flooding worse, leading to one of the state's worst natural disasters.

STEP SUPPLEMENTAL HAZARD LESSON

FLOODS



E. While California often has droughts, where little rain falls for a long period of time, sometimes it gets way too much rain in far too short a time. This happened in 2005, when up to 20 inches of rain led three rivers near Los Angeles to flood. The heavy rain caused mud slides down steep mountainsides around the city.

F. Guam is a U.S. territory located in the Pacific Ocean. The tiny island is about 6,000 miles from the California coast. Guam has the highest risk of being hit by a hurricane (which are called typhoons in this area of the world) of any U.S. state or territory. In 1976, Super Typhoon Pamela dumped nearly 34 inches of rain on the island and damaged about 80% of Guam's buildings.

G. Sometimes tropical storms, which aren't as strong as hurricanes, can bring even more rain than hurricanes. Tropical Storm Allison is one of them. It dropped 40 inches of rain in Texas and flooded 70,000 houses in the Houston area in 2001.

2. Using the information from the graph and information about the floods, answer the following questions:

a. How much more rain fell in Tropical Storm Allison in Texas than in the Rapid City, South Dakota flood?

b. Which flood happened most recently?

3. A storm starts outside your school, and the rain is so heavy it's hard to see outside to the playground. The meteorologist, someone who studies and predicts weather, says it is raining at a rate of 3 inches per hour, enough to cause flooding. But, the rain stops in about half an hour. How much rain has fallen?

4. Storm surge happens during a storm when very strong winds push water onshore. This often occurs during a hurricane, and the storm surge can flood everything nearby. Hurricane Katrina, which hit Louisiana in 2005, had the highest surge of any U.S. hurricane. The storm surge was 28 feet. Make a check mark in front of the things the water was higher than:

a. LeBron James ___

b. A giraffe ___

c. A mountain ___

d. The Empire State Building ___

5. If a creek floods, and half a foot of water spills onto the sidewalk, would that be enough to knock you down?

STEP SUPPLEMENTAL HAZARD LESSON

FLOODS



A Forecast for Floods Answer Key

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OK, class. That's all we have time for today. Remember to stay alert tomorrow in case there is **flooding**.

Lily: And don't forget to take your umbrella to school!



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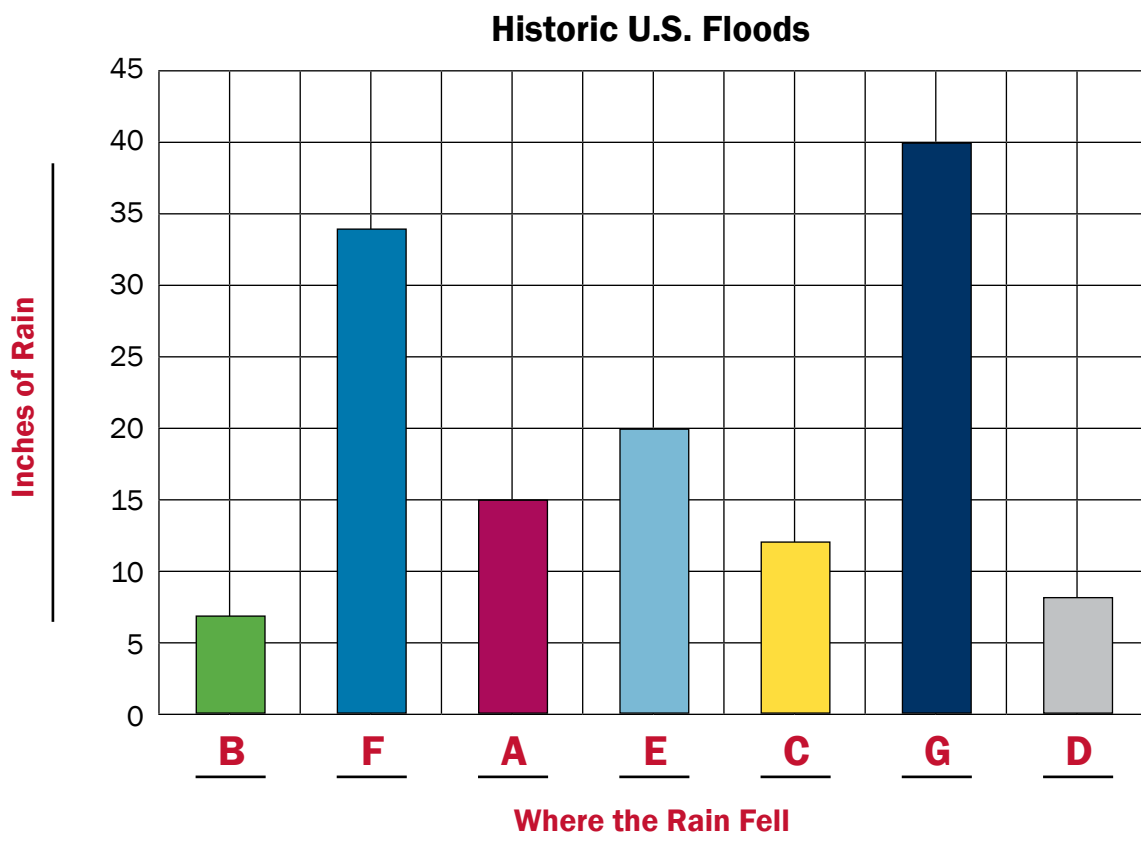
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25 Inches

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2005 Los Angeles flood

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1 ½ inches

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Yes