



Floods

3–5

Flood Safety

LESSON PLAN 3

Learn Flood Safety

Children and their families are safer when they understand the precautions and actions needed to stay safe in the event of flood.

Key Terms and Concepts

crest	flash flood WATCH	flood WATCH
debris flow	flood stage	storm drain
flash flood WARNING	flood WARNING	streambed

Purpose

To help students and their families be prepared and stay safe during floods and flash floods

Objectives

The students will—

- Demonstrate awareness of the dangers of flash floods and floods
- Use *Stay Safe in a Flood or Flash Flood* to determine important flood safety rules.
- Create and disseminate effective flood safety information that will reach other students.
- Experiment to understand debris flow. (Linking Across the Curriculum)
- Describe possible flood scenarios and create lists of safe actions to take.
- Share *Family Flood Safety Plan* with their families to develop flood awareness and reinforce safe actions. (Home Connection)
- Critique flood reports in the media and write news reports that represent good media coverage. (Linking Across the Curriculum)
- Follow *Speed of Stream Flow* to measure and calculate the average speed of flow of moving water. (Linking Across the Curriculum)

Activities

“Flood Dangers”

“Flood Safety”



Visit the American Red Cross Web site
at www.redcross.org/disaster/masters



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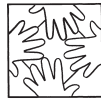
Learn Flood Safety

Materials

Stay Safe in a Flood or Flash Flood, 1 copy per student



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"Flood Dangers"

SET UP 10 minutes CONDUCT 25 minutes

Science: Earth Science and Health; Language Arts: Communication;
Social Studies: Community

1. Based on their understanding of how floods occur, have the students describe the dangers of floods:
 - Rising waters can flood riverbeds and damage or destroy property.
 - Rising waters can trap you in an unsafe place.
 - Rapidly moving floodwaters can uproot, knock down or carry away trees, buildings and vehicles.
 - At flood stage, water can break through dams and tear up bridges or roads.
 - Waters can rise quickly if soil has reached its saturation point.
 - In a matter of minutes or even seconds, waters can inundate a floodplain, a low-lying area, a storm drain or a dry streambed.
2. After the students have discussed the class list of the dangers of floods, distribute *Stay Safe in a Flood or Flash Flood*. Explain that this handout represents the most important flood safety rules for young people. Why?



Wrap-Up

Have the students discuss the information from the handout to answer the following questions.

- What is the difference between a flash flood WATCH and a flash flood WARNING? Between a flood WATCH and a flood WARNING? (A flash flood WATCH indicates that flash flooding is possible in or close to the WATCH area. A flash flood WARNING indicates that flash flooding is actually occurring or is imminent in the WARNING area. A WARNING can be issued as a result of torrential rains, a dam failure or snow thaw. A flood WATCH indicates that a high flow or overflow of water from a river is possible during the specified time. A flood WARNING indicates that conditions are actually occurring or are imminent in the WARNING area.)
- How does flash flood safety compare with river flood safety? (Usually there is a longer warning period for a river flood. Flash floods can build up quickly from debris or ice jams and do not necessarily accompany slowly rising water levels. Flash flooding occurs within a short period of time; river flooding is a more prolonged event and may last a week or more.)
- Are students ever in an area that could be subject to flooding? Where? When? Do they know how to get to safety? (Answers will vary.)



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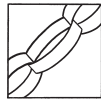
Learn Flood Safety

Materials

- Trough (a 2-foot [60-centimeter] piece of rain gutter or one made from a 1- or 2-liter plastic soda bottle)
- Sand and debris (gravel, twigs, pieces of bark and other like materials)
- Large pitcher of water
- Large pail



Challenge the students to find creative and effective ways to disseminate flood safety information in the school: posters, school bus fliers, bulletin boards, morning announcements and lunchroom skits. Make sure that the information is consistent, correct and easy to understand and remember.



Linking Across the Curriculum

Science: Earth Science and Physical Science; **Language Arts:** Vocabulary



Write the term “debris flow” on the board. Ask the students to try to define the term. Complete the following demonstration to help the students understand the added danger of debris flow during heavy rains and floods.

1. Have ready a trough, dry sand, the debris, a large pitcher of water and a large pail.

TEACHING NOTE A 2-foot (60-centimeter) piece of gutter makes a great trough, or you can make your own. Take a 1- or 2-liter plastic soda bottle and cut off the bottom and the top funnel area. Cut the trimmed bottle in half lengthwise and tape the two pieces together.

2. Fill the trough with dry sand and debris and tilt the trough over the pail. Ask the students to observe the flow.
3. Put the dry sand and debris back into the trough and dampen it. Now, tilt the trough over the pail once again and have the students observe the flow.
4. Finally, put the sand and debris back into the trough and this time drown the sand with water. Now, tilt the trough over the pail and have the students observe the flow.
5. Discuss with the students the dangers of debris flow. When could they happen? Where might these dangers happen? Could they occur in your area? Explain. What materials would comprise the debris that flowed with the mud?



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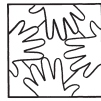
LESSON PLAN 3 Learn Flood Safety

Materials

- Chart paper and markers (for each group)
- *Family Flood Safety Plan*, 1 copy per student (Home Connection)
- *Speed of Stream Flow* (Linking Across the Curriculum)



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"Flood Safety"

SET UP 10 minutes CONDUCT 30 minutes

Science: Earth Science and Health

1. As a class, compile a list of possible scenarios—"what-ifs"—for a flood situation. For example:
 - If you look outside and see that it has been raining hard for quite a while...
 - If you turn on the radio and hear about a flood WATCH...
 - If you are planning to take shelter on higher ground...
 - If you are in the car ready to evacuate and see rising water in the streets...
 - If you are on the bottom floor of your home and a flood WARNING is announced...
2. Divide the class into small groups and distribute chart paper and markers to each group. Have them choose two or three of the scenarios and write a list of safe actions for each.



Wrap-Up

Have the groups share their solutions and explain why each decision will help them stay safe.



Challenge the students to consider their own families in some of these situations. Have them discuss—

- How would you awaken your family?
- What is the first thing your family would do?
- Where is the family disaster supplies kit?
- When would you leave the house?
- Where would you go?
- What if you could not drive to higher ground?

TEACHING NOTE Find out about a family disaster supplies kit and evacuation in the *Be Disaster Safe* module of *Masters of Disaster*.



Home Connection

Distribute *Family Flood Safety Plan* to students to share at home. Have them use the activity sheets to develop flood safety plans with their families.

TEACHING NOTE For more detailed information about flood safety and preparedness, refer to the Flood Safety Checklist in the Background.



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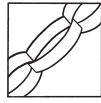
LESSON PLAN 3 Learn Flood Safety

Materials

- Several oranges
- Tape measure
- Stopwatch or watch with a second hand
- Pencil
- Various streams of water



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Linking Across the Curriculum

Language Arts: Media Literacy

Have the students describe reports on floods that they have seen on television. Conduct a class survey to rate the media on flood education.

- Did the reports provide an explanation of floodwater dangers?
- Did the reports explain why the flood was occurring?
- Did the reports illustrate ways to stay safe during a flood?
- Did the reports act as a warning to others?
- Did the reports help young people understand the dangers or did they reach only adults?
- Did the reports provide resources for safety and insurance information?

Based on the survey, help the students rate the media on flood education. When the ratings are complete, have student groups write a news report on an actual or fictitious flood in their area. Have the groups present their reports, and critique and rate each other's presentations based on the criteria generated from the answers above.

Science: Earth Science and Health

During a heavy rain there can be lots of lightning. Use activities from the *Lightning* module of *Masters of Disaster* to help students stay safe when lightning strikes.

Science: Earth Science and Physical Science; Mathematics: Measurement and Calculation

If possible, take a field trip to several waterways in the area. Distribute the activity sheet *Speed of Stream Flow* and have student groups measure the speed of each waterway. Help the students compare their findings. What factors contribute to the speed of flow? Will it remain the same no matter the season, precipitation or snowmelt? Explain.



Stay Safe in a Flood or Flash Flood

Page 1 of 1

Name _____

When it has been raining hard or for a long time, always check the weather before going out. Listen for WATCHES or WARNINGS for your area:

- Flash flood WATCH—Flash flooding is possible.
- Flash flood WARNING—A flash flood is occurring now or could occur immediately.
- Flood WATCH—Flooding is possible.
- Flood WARNING—Flooding conditions are occurring now or could occur immediately.

Stay away from storm drains, culverts, canals, ditches, canyons, arroyos, dry or rising streams, creeks and rivers, areas of runoff, or places with fast-moving waters.

After heavy rains, do not climb or walk on muddy hills. The soil could shift and slide.

Obey any official signs or barricades that show where flooding may occur or has already occurred.





Family Flood Safety Plan

Page 1 of 1

Name _____

Directions: Fill in the form below to keep you and your family safe in case of flooding.

1. Where is your family disaster supplies kit?
2. Where will you go if you have to leave your home because of possible flooding? Whom will you call?
3. Where is the safest place in your home in case of flooding?
4. Where is “high ground” in your area?
5. What areas in your neighborhood should be “off limits” because of dangers from floods and flash floods?
6. How will you find out about a flood or flash flood WATCH or WARNING?





Speed of Stream Flow

Page 1 of 2

Name _____

Caution: This activity must be done with an adult. Be sure to check the weather forecast and weather conditions before doing this activity.

Directions: The speed of flow of a stream or river can contribute to the possibility of flood. You can measure the speed of flow of a stream in your area with just a few simple items.

- Several oranges
- Stream of water
- Tape measure
- Stopwatch or watch with a second hand
- Pencil

Mathematical Note: Water flows fastest near the surface because it has less friction from the bottom of the streambed. To get a good average speed for the entire depth of the stream, multiply your answers by 0.8. For example, if you find that the orange moved 100 feet in 25 seconds, the speed of flow would be 4 feet per second. Multiply this by 0.8 and the average speed of flow would be 3.2 feet per second.

What to do—

1. Measure and mark a specific distance alongside the stream.
2. Drop an orange upstream and start timing.

Start time: _____

3. When the orange reaches your measured length, stop timing.

End time: _____

Distance traveled: _____





Speed of Stream Flow

Page 2 of 2



4. Repeat Steps 1, 2, and 3 several times over different stretches of the stream.

What is the **highest** speed of flow? _____

What is the **lowest** speed of flow? _____

What might account for the differences? _____

What is the **average** speed of flow? _____

5. Calculate the **average speed of flow** for the stream. _____

