

TEACHER'S GUIDE

UNDERSTANDING FLOODS

for Fourth Grade Students

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WELCOME to your comprehensive guide to teaching the different types of flooding. It is intended for use where appropriate during the Weather Unit and as a timely supplemental resource during hurricane season and leading up to Virginia Flood Awareness each March. It can also be repurposed for Disaster Preparedness Month and during Virginia's hurricane season. This resource is designed to enhance understanding and awareness among 4th-grade students, promoting environmental consciousness and encouraging proactive behaviors. It also supports skills such as critical thinking, citizenship, communication, collaboration and creativity.

This guide is particularly relevant to students in the City of Virginia Beach, a region known for its susceptibility to various forms of flooding, including storm surge and flash floods. Understanding the different types of flooding is not only critical for safety, but it also aligns with the local curriculum.

The included lesson plans align with the 4.1, 4.4, and 4.8 strands of the 2018 Science Standards of Learning for Virginia Public Schools. It supports curriculum SOLs for fourth graders such that: (1) students will demonstrate an understanding of scientific and engineering practices, (2) students will investigate and understand that weather conditions and phenomena affect ecosystems, and (3) students will investigate and understand that Virginia has important natural resources (i.e., watersheds, water and soil) that can and should be conserved. By using this guide to inform students about floods, teachers will be hitting key SOL standards while equipping students with knowledge that is vital to their community.

LESSON PLAN OVERVIEW

LESSON 1: Introduction to Floods

This lesson introduces students to the concept of floods, their causes, and their effects on the environment and human communities. Included are hands-on activities and engaging visual aids to help students grasp the basic understanding of floods.

LESSON 2: Types of Floods

This lesson focuses on the different types of floods - river floods, coastal floods, and flash floods. Students will learn what causes each type and where in the world they are most likely to occur.

LESSON 3: The Impact of Floods

Students will explore the aftermath of floods, learning about their impact on human life, local economies, and the environment. This lesson uses case studies of significant historical floods to illustrate the potential severity of these natural disasters.

LESSON 4: Flood Safety and Preparedness

In this lesson, students learn about flood safety and how to prepare for potential flood events. They will develop an understanding of the importance of early warning systems and evacuation plans, fostering a sense of responsibility.

LESSON 5: Review and Reflection

The lesson concludes with a review session and a reflection activity. Students will have a chance to present what they've learned and share their thoughts on how to contribute to flood prevention in their communities.

This guide is intended to be more than a teaching resource. It is a tool to inspire action and foster a generation of responsible and informed citizens.

Upon completion of these lessons, students will have a comprehensive understanding of floods and be equipped with the knowledge to help protect themselves and their communities from potential flood disasters.

INTRODUCTION TO FLOODS



OBJECTIVE:

By the end of this lesson, students will be able to define what a flood is, identify its causes, and understand its effects on the environment and human communities.



MATERIALS NEEDED:

- Photos of floods/droughts
- Video
- Chart paper



PROCEDURE

1.



INTRODUCTION: (10 MINUTES)

Do a picture sort of **floods** vs. **droughts**. Ask students about their observations of each and build a working definition. Explain that floods are an example of weather phenomena and are related to our water resources.

2.



VIDEO SESSION: (15 MINUTES)

Show a short video (**Ask a Scientist**) about the causes of floods and their effects on the environment and human communities. Discuss the video with the students, focusing on the weather conditions and phenomena that lead to floods.

3.



INTERACTIVE DISCUSSION: (15 MINUTES)

Ask students to recount any experiences or knowledge they have regarding local floods, prompting them to consider how these weather phenomena impact the ecosystem. Use a chart to list effects on humans, effects on plants, effects on animals, and effects on nonliving factors.

4.



ACTIVITY: (15 MINUTES) Have students work together to create a top 3 list including top 3 causes of floods and top 3 effects.

WRAP-UP: (5 MINUTES) Conclude the lesson by going over the top 3 lists as a class. Encourage students to share how they would prepare for a flood and what they can do to protect their local water resources.



ASSESSMENT: Collect the top 3 lists at the end of the class. The completed lists will assess students' understanding of the causes and effects of floods.

INTRODUCTION TO FLOODS



OBJECTIVE:

By the end of this lesson, students will be able to identify and describe the different types of floods, understand their causes, and know where they are most likely to occur.



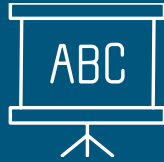
MATERIALS NEEDED:

- Map of Virginia
- Video clips about different types of floods



PROCEDURE

1.



INTRODUCTION: (10 MINUTES)

Begin the lesson by revisiting the concept of floods from the previous lesson.

Introduce the types of floods that affect Virginia Beach:

- *Fluvial, or river floods
- *Pluvial, or flash/street floods
- *Coastal, or storm surge

2.



VIDEO SESSION: (20 MINUTES)

Show the video on **flood types** and discuss the causes and effects of each. Reinforce understanding of weather phenomena that lead to floods.

3.



INTERACTIVE DISCUSSION: (10 MINUTES)

Facilitate a discussion that encourages students to relate each type of flood to locations in Virginia or the world where they might occur. With the help of a map, have students identify areas that are most prone to flooding and discuss why this is the case. This engagement reinforces the understanding of Virginia's regions, Virginia's resources, and the impact of flooding.

4.



ACTIVITY: (15 MINUTES) Ask students to select one type of flood to describe. The description should include the causes, the effects, and where the flood normally occurs.

WRAP-UP: (5 MINUTES) Conclude the lesson by reviewing the student work answers as a class. Encourage students to share how understanding the types of floods can help in predicting and preparing for such events.

ASSESSMENT: Collect the student work at the end of the class. The completed student work will assess students' understanding of different types of floods, their causes, and areas of occurrence.

THE IMPACT OF FLOODS



OBJECTIVE:

By the end of this lesson, students will be able to understand and describe the impact of floods on human life, local economies, and the environment.



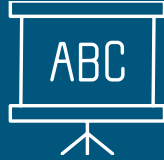
MATERIALS NEEDED:

- News clips about major historical floods
- [Ripple Effect video](#)



PROCEDURE

1.



INTRODUCTION: (10 MINUTES)

Begin the lesson by reviewing the different types of floods and their causes. Introduce the topic of the day: the impact of floods on communities, economies, and the environment.

2.



VIDEO SESSION: (20 MINUTES)

Show the [original Ripple Effect video](#) showcasing the impacts a major flood can have. After the video, discuss the ramifications highlighted in the video.

3.



CASE STUDY DISCUSSION: (15 MINUTES)

Provide the students with brief news summaries about a major historical flood (e.g., [Hurricane Matthew](#)). Facilitate a discussion on the impact of that specific flood on human life, local economies, and the environment.

4.



ACTIVITY: (15 MINUTES) Have students divide a paper into four quadrants, labeled human life, economy, environment and other. Students will list the impacts from Hurricane Matthew on Virginia Beach in each of those areas.

WRAP-UP: (5 MINUTES) Summarize the lesson by reviewing the answers with the class. Encourage students to share their thoughts on the measures that can be taken to mitigate the impacts of floods.



ASSESSMENT: Collect the answers at the end of the class. The completed answers will evaluate students' understanding of the impact floods have on communities, economies, and the environment.

FLOOD SAFETY AND PREPAREDNESS



OBJECTIVE:

By the end of this lesson, students will have a fundamental understanding of flood safety measures and preparedness.



MATERIALS NEEDED:

- Video clips about food safety and preparedness
- Evacuation Plan Sample
- Safety Information



PROCEDURE

1.



INTRODUCTION: (10 MINUTES)

Begin by revisiting the impact of floods on human life, economies, and the environment. Introduce the day's topic: flood safety and preparedness.

2.



VIDEO SESSION: (20 MINUTES)

Show a **short video** about flood safety measures and the importance of preparedness. Discuss the key points highlighted in the video.

3.



SAFETY MEASURES DISCUSSION:

(15 MINUTES) Facilitate a discussion on the importance of early warning systems, evacuation plans, and other safety measures during floods. (See additional resources on page 14)

4.



ACTIVITY: (15 MINUTES) Make a poster or slide outlining a couple of the most important safety measures people should remember.

WRAP-UP: (5 MINUTES) Conclude the lesson by reviewing the answers, emphasizing the importance of flood safety and preparedness.



ASSESSMENT: Collect the answers at the end of the class. These will assess the students' understanding of flood safety measures and preparedness.

REVIEW AND REFLECTION



OBJECTIVE:

By the end of this lesson, students will be able to use their knowledge of floods to propose a possible solution for a particular type of flood to lessen the effects of flooding on people, the economy and the local ecosystem.



MATERIALS NEEDED:

- Student work and notes from previous lessons
- Organizer for planning solutions
- Materials to allow for a variety of presentation types (computers, posters, paper, etc)



PROCEDURE



1.

DEFINE THE TASK: Tell students that in order to be a future-ready resident of Virginia Beach, they must be critical thinkers and responsible leaders. Since they have learned that flooding is a concern in the city of Virginia Beach, it will be their responsibility to suggest a few next steps to help address the effects of flooding. Students will have a choice to present their solutions in writing, orally, or visually with pictures or symbols.



2.

PROBLEM SOLVING: Assign or have students choose a particular type of flood (river, flash, coastal, urban). Students may work alone or in small groups. Have students review the causes of their assigned type of flood and the effects of this flood type on people, the economy, plants, animals, and the nonliving parts of ecosystems. Then, have students consider how those effects might be lessened or prevented and ideas they might consider as a potential solution. Students should complete an organizer, like the one below, to capture and organize their thoughts.



3.

PRESENTING: Provide students time to prepare for the presentation of their solutions. Remind students that a clear presentation helps people understand how their proposed solution will lessen the effects of the flood type. Consider inviting other classes, school staff, parents, or members of the community to view the presentations.



4.

REFLECTING: At the conclusion of the learning, have students reflect on the ideas shared by others. Students should select an idea from another group or student and write one reason why that solution would be effective.

WRAP-UP: Conclude the lesson by highlighting the types of floods and the variety of solutions posed. Remind students that all citizens have a responsibility to be aware of issues facing the community and work together to find the best ways to creatively solve them.



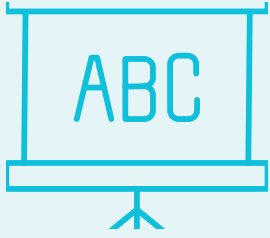
ASSESSMENT: Completed presentations and reflections should be assessed for student understanding of the causes of flooding, its effects on people, the economy, and the ecosystem and how well the solutions presented addressed those effects.



FLOOD SOLUTION CHART

TYPES OF FLOOD:		
Short description of flood, including what causes it:		
What are the potential effects of this kind of flood on:	How can these be prevented? How can these be less damaging?	My Ideas for a Solution:
PEOPLE: How is this type of flood dangerous to people?)		
ECONOMY: (How is this type of flood expensive?)		
PLANTS: (How does this type of flood harm or kill plants?)		
ANIMALS: (How does this type of flood harm or kill animals?)		
NONLIVING PARTS OF THE ECOSYSTEM: (How does this type of flood affect the water, soil, air, nutrients, sunlight, or sand in an ecosystem?)		





ADDITIONAL RESOURCES

For more ideas and information on teaching about floods, check out these supplementary resources:

- **The Chesapeake Bay Foundation** can help provide real-world learning experiences for students. Explore opportunities with its Student Field Programs. | <https://www.cbf.org/join-us/education-program/field-programs/>
- **The National Oceanic and Atmospheric Administration (NOAA)** provides educational resources on floods and other natural disasters. | <https://www.noaa.gov/education>
- **The Nature Conservancy** has a great resource for teachers featuring lesson plans, activities, and more. | <https://www.nature.org/en-us/about-us/who-we-are/how-we-work/youth-engagement/nature-lab/elementary-lesson-plans/>
- **National Geographic Education** offers a wide range of materials including free videos, infographics, and interactive activities. | <https://www.nationalgeographic.org/society/learn/>
- **The American Red Cross** offers a comprehensive preparedness guide for floods and other natural disasters. | <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/flood.html>
- **The National Flood Insurance Program** provides additional safety resources, including a flood readiness checklist. | <https://www.floodsmart.gov/>

Recommended Video Clips

To support your lesson plans, we recommend the following video clips. These videos provide real-world examples and explanations that will help your 4th-grade students understand the concept of flooding better:

- **UNDERSTANDING FLOODING: Ask A Scientist: What Causes Floods-** This short video explains the basics of what causes a flood.
- **HOW IT WORKS - FLOODING 101: Three Types that Affect Virginia Beach**
- **FLOOD SAFETY: American Red Cross's "Flood Safety Tips"** - This video provides a simple explanation of what to do before, during, and after a flood.



TEST YOUR KNOWLEDGE

To wrap it up, we've included a few activities to review students' understanding of floods.

- Create an illustrated timeline of historical and recent storms and floods in Virginia. This activity will help students understand the potential severity of these natural disasters while also increasing their knowledge about environmental changes over time.
- Design a game or scavenger hunt to reinforce students' understanding of the different types of flooding and their impact on human life, local economies, and the environment.
- Create a role play in which students take on the roles of government officials trying to come up with a solution for preventing floods from occurring in their community. The role play could include determining actions to take during a flood (students can decide what type of flood is occurring) and developing solutions to prevent the flood in the future. This activity will help them understand the complexities of natural disasters and discuss strategies for mitigating their effects.



These activities can be used to reinforce your teaching about floods as well as increase student engagement in the classroom.

We hope you enjoyed this guide, and we wish you all the best for the school year!

