

## Writing Floods

	<b>Writing Floods Lesson Plan</b>
<b>Length</b>	<b>One session (90 minutes)</b>
<b>Materials Needed</b>	<ul style="list-style-type: none"> <li>• Video clip of the Big Thompson River at Viestenz-Smith Mountain Park (see <a href="#">Writing Water curriculum webpage</a> for YouTube link)</li> <li>• Video of interview with Dan Willadsen from the City of Loveland, Colorado (see <a href="#">Writing Water curriculum webpage</a> for YouTube link)</li> <li>• 22-inch sheet of blank paper for each writer</li> </ul>
<b>Lesson Focus</b>	The 2013 flood of the Big Thompson River in Colorado
<b>Learning Goals – Writing</b>	<ul style="list-style-type: none"> <li>• To generate collaborative lists</li> <li>• To write haiku poetry</li> <li>• To practice reflective storytelling</li> </ul>
<b>Learning Goals - Water</b>	<b>Guiding Questions:</b> <ul style="list-style-type: none"> <li>• What is a flood?</li> <li>• How do floods affect us?</li> <li>• What is a “flood” that has affected your life? What have you had to move out of the way?</li> </ul>
<b>Target Audience</b>	<b>Community writers</b>
<b>Warm-Up Writing (5 mins)</b>	<b>Introduction (3 minutes):</b> Share video of Big Thompson River at Viestenz-Smith Park (0:42)

<p><b>Writing Prompt #1 (20 mins)</b></p>	<p><b>Setting the Scene (Prewriting—12 minutes):</b> Sometimes our language is flat; it just doesn't share the exact image we want to convey to ourselves and/or our readers. Today we're going to start with a writing exercise to liven up our sentence structure.</p> <ol style="list-style-type: none"><li>1. Divide a piece of paper into two columns.</li><li>2. On the left hand side, write as many verbs (action words) as you can think of. Try not to censor yourself; just record as many as you can.</li><li>3. On the right hand side, write as many nouns (people, places, things, ideas) as you can think of related to nature.</li><li>4. Share sample lists:<ol style="list-style-type: none"><li>i. <u>Verbs</u>: Jumped, Snaked, Exhaled</li><li>ii. <u>Nouns</u>: Trees, Rocks, Water</li></ol></li><li>5. Craft sentences using a noun from the right with a verb from the left.</li><li>6. Share samples:<p>The water snaked through the canyon. The trees exhaled as the wind shook their branches.</p></li><li>7. Invite students to share their writing.</li><li>8. We will come back to this exercise later in this workshop.</li></ol> <p>Note: Adapted from Natalie Goldberg's Visual Verbs exercise in <i>Writing Down the Bones</i>.</p>
<p><b>Writing Prompt #2 (25 mins)</b></p>	<p><b>Water Science Lesson (15 minutes):</b> We're going to talk about flooding: what it is, what causes flooding, what are the dangers, what are the benefits. As we discuss flooding, write down words that stand out to you.</p> <ol style="list-style-type: none"><li>1. What is a flood?<ul style="list-style-type: none"><li>• When discussing floods, it's important to understand what they are. Let's start with a flooding definition.</li></ul></li></ol>

- A **flood** is an overflow of water that submerges land that is usually dry. This water could come from a river, lake, the ocean, rain, snow, etc. Floods are an area of study in the discipline of hydrology. They are the most common and widespread natural severe weather event.
  - Floods can look very different because flooding covers anything from a few inches of water to several feet. They can also come on quickly or build gradually.
  - A **river can flood** when flow in the river extends to the floodplain or overtops humanmade structures. This flooding can happen in any river corridor. This includes everything from small streams to the world's largest rivers. In Colorado, we are prone to river flooding.
2. What are the causes of river flooding?
- River flooding typically happens for four reasons. They are:
    - Excessive rain from tropical storm systems making landfall
    - Persistent precipitation over the same area for extended periods
    - Combined rainfall and snowmelt
    - Ice jam/ice dam that block the river partially or fully
  - In Colorado, rivers are most likely to flood due to persistent thunderstorms and combined rainfall and snowmelt, and lack of access to their floodplains.
3. What is a flash flood?
- The most well-known and deadly type of flood is a flash flood.
  - A **flash flood** is flooding that begins within 6 hours, and often within 3 hours, of heavy rainfall (or other cause).
4. **What Causes Flash Floods?**
- Flash floods can happen for several reasons.
  - Most flash floods happen after extremely intense rainfall from severe thunderstorms over a short period of time (normally 6 hours or less).
  - There are two key elements to determine if flash flooding is likely:
    - Rainfall rate
    - Rainfall duration
    - Other elements include: initial soil moisture, vegetation cover, rate of infiltration/amount of impermeable surface, and if the rainfall also causes hillslope failure and/or mass movements.
  - Flash floods also happen when dams break, when levees fail, or when an ice jam breaks releasing a large amount of water.

5. What are the dangers of flash floods?
  - Flash flooding is the #1 severe weather killer in the United States.
  - Flash floods are extremely powerful. They have enough force to roll boulders, tear trees from the ground, destroy buildings and bridges, and scour out new channels. This happens because flows like these have very high energy, and therefore have a much higher competence (can carry much larger sediment than lower energy flows).
  - This type of flood is characterized by raging torrents that rip through river beds, urban streets, or canyons, wiping out everything in their paths. With heights reaching 30 feet, flash floods can completely cover communities.
  - Another reason why flash flooding is so dangerous is that it can happen with little to no warning. This is especially true when dams or levees break.
6. While severe floods can be destructive and sometimes deadly, they are also important for natural ecological processes and geomorphic change.
  - When rivers have access to their floodplains, flood waters spread out, slow down, and deposit sediment and nutrients.
  - Fast-moving waters also scour fine sediments from gravels. Salmon and other fish rely on these seasonal high flows to clean the gravel that they lay their eggs in.
  - Large flows rework channels, such as breaking and reforming logjams, widening meanders, and carving slot canyons.
  - Floods are not all bad, especially when rivers are given room to move.

Source: [What is a Flood? | What Causes a Flood? | Flooding | Earth Networks](https://www.earthnetworks.com/flooding/#river-flood)  
(<https://www.earthnetworks.com/flooding/#river-flood>)

**Writing Activity (15 minutes)**

1. What words did you write down related to flooding?  
Samples include: overflow, rivers, deadly
2. We are going to use the words to write a haiku poem
3. A haiku has 3 lines.

	<ul style="list-style-type: none"> <li>● The first line has 5 syllables.</li> <li>● The second line has 7 syllables.</li> <li>● The third line has 5 syllables.</li> </ul> <p>4. Sample poem based upon the Water Science Lesson (above)      Flooding river sends      Danger to people below      Climb to higher ground</p> <p>5. Invite writers to share their poems and reflect on the language we use to describe and tell the stories of floods.</p>
<p><b>Writing Prompt          #3          (35 mins)</b></p>	<p><b>Background discussion:</b> How many of us remember the Big Thompson flood of 2013? What do you remember about it? (Invite participants to share memories).</p> <p><b>Timeline of the 2013 Flood:</b> A look back at the flood that hit Larimer and other Colorado counties the week of Sept. 9, 2013, and how it affected the Loveland area.      Source: <a href="https://www.reporterherald.com/2018/09/08/the-2013-flood-a-timeline/">https://www.reporterherald.com/2018/09/08/the-2013-flood-a-timeline/</a></p> <p><b>Video—The Colorado Flood of 2013</b>, an interview with Dan Willadsen, Parks Manager, City of Loveland at the Viestenz-Smith Mountain Park, Loveland (<b>6 minutes</b>)</p> <p><b>Writing (15 minutes)</b></p> <ul style="list-style-type: none"> <li>● Some areas received 22 inches of water.</li> <li>● Give each writer a sheet of paper measuring 22 inches long.</li> <li>● In the video, Dan Willadsen shares, “We’ve got water rising quickly.” The water rose 18 inches in 15 minutes. “We moved as much stuff as we could out of the way of the river—picnic tables, equipment-- anything we could move that we though could get pushed downstream or get destroyed, we moved.”</li> </ul>

	<ul style="list-style-type: none"> <li>● In life, we each experience our own “flood,” a time when we are overrun by events or circumstances. We find ourselves in rapidly rising water. We move everything we can out of harm’s way, but the flood still devastates.</li> <li>● Think about a time when you experienced a flood, literally or metaphorically, in your own life. Let’s write a short narrative about it.</li> <li>● <b>Introduction:</b> Set the scene. Consider creating a timeline for your flood story. Where does the story begin?</li> <li>● <b>Plot:</b> This is the action—the events of your timeline. What happened leading up to and during your flood event? Go back to your writing from earlier tonight, your lists of verbs and nouns. How can you weave this type of sentence structure into your play?</li> <li>● <b>Characters:</b> Who is involved in this story? What does the reader need to know about each character?</li> <li>● <b>Setting:</b> Where did this “flood” take place? What kind of details do you remember?</li> <li>● <b>Climax:</b> What was happening at the height of the flood, when the water reached its highest level, when you (or someone else) were in the most danger? What did you have to move out of the way to help protect yourself or those around you?</li> <li>● <b>Conclusion:</b> How did this flood event resolve itself? What, if anything, did you learn from your flood event?</li> </ul>
<p><b>Wrap-Up (5 mins)</b></p>	<ul style="list-style-type: none"> <li>● Revisit tonight’s guiding questions:           <ul style="list-style-type: none"> <li>○ What is a flood?</li> <li>○ How do floods affect us?</li> <li>○ What is a “flood” that has affected your life? What have you had to move out of the way?</li> </ul> </li> <li>● What is one thing you are taking away from tonight’s workshop?</li> <li>● Brainstorm two ideas to keep writing about.</li> </ul>

*This lesson plan is free to download and use. The Writing Water Curriculum Project (WWCP) was developed in 2021-2022 with support from The Colorado Water Center at Colorado State University and in collaboration with interns at the Community Literacy Center. Special thanks to Emily Iskin, our graduate research assistant and expert in fluvial geomorphology, who provided essential consultation in water science and created original water-inspired art for the WWCP webpage.*