How strong is flowing water?

(All Seasons | Grades 3-8) • **Map Stop 4** • Look for a small paved area with a wooden fence on one side. The creek is in a ravine on the other side of the fence.

Why did they use concrete to surround the banks of the creek? And where does all the water go when it rains?

Background Information:

What is **concrete**? It's a mixture of a **cement** (any substance that binds materials together), water, and an **aggregate** (sand, crushed rock, or other small bits). You can have concrete of different strengths depending mostly on how much water and which minerals are in the mixture. The minimum concrete strength starts at 2,500 pounds per square inch. It makes a good barrier because it is able to withstand a good amount of force.

Erosion:

Why do we have a concrete **barrier** here around the creek? When water travels down to and along rivers, it pulls things like dirt and rocks away from the path it travels along. Over time, water can pull a lot of material, which makes rivers and creeks wide and deep over time - this is how the Grand Canyon was formed! Any process by which material is gradually taken away like this is called **erosion**.

So what's the **ANSWER** ? The concrete wall was built to hold the steep banks of the creek in place, to stop the water from eroding the bank. The wall will prevent the creek from removing soil from the surrounding yard, which would widen the creek and move its banks.

Erosion is alright when there are no buildings close by, but humans often build next to rivers. By using concrete, humans can help **slow down** creek bank erosion. The bank is stabilized so that the water can't pull so much dirt from the bank that it widens the creek. This prevents houses from falling into creeks - you can see the house across the creek as an example.

What else can slow down erosion? In many cases, planting the proper **plants** along creek banks and other places can stop erosion in its tracks, thanks to the way plants' extensive **root systems** hold together all of the dirt and rocks - acting like the cement holding together aggregate in a sort of living concrete! However, some plants can worsen erosion when put where they don't belong, which makes maintaining plant life and healthy **ecosystems** important for making sure waterways, soil, and shores stay safe.

The Water Cycle:

When it rains, some water goes into the soil and is taken up by plants, or is soaked deep underground. But when the ground is compacted, full, or covered with roads or rocks, most of the water (whether rain, snow, or other **precipitation** falling from the sky) washes away as **runoff**. This means it travels across the ground, running downhill until it reaches a storm drain, or a creek or river, before eventually flowing into a larger body of water like an ocean or a lake.

This creek is part of a larger system of flowing water all flowing to one place, known as a **watershed** - specifically, the **Trinity Basin Watershed**. Rain water drains from high areas of the watershed to low areas, and finds its way to creeks like this one, which flows into Coombs Creek, then into the Trinity River, then to the Gulf of Mexico.

When the sun heats up creeks, rivers, lakes, and oceans, in any part of the watershed, some of the **liquid** water becomes water **vapor** (a **gas**, present in all the air we breathe), eventually rising up into the clouds and starting the cycle all over. The water vapor eventually comes down as precipitation like rain once again. The water you see in the creek is part of our **Water Cycle**, and has been a part of it for **millions of years**. That means we drink the same water that the dinosaurs drank, recycled over and over again!

For the Activity:

Draw a picture that tells the story of this creek's water as it flows through the water cycle. Then, draw a picture of an area being affected by erosion, and what stories that process may tell. Use our illustration below as a helpful starting point! You may draw on the illustration provided, draw in your notepad or draw on the note sheets included at the top of this document if you printed them.