



**Maricopa County**

**Stormwater Program**

# **Be Watershed Wise**

4th-8th Grade  
Lesson Plan

# Background

About 71% of the Earth is made up of water, made up of waterbodies such as our lakes, rivers, and oceans. When it rains, that stormwater is added to the existing water supply. When it's just rain water, this isn't a big deal, but, when the water hits the ground in urban areas and is washed into a storm sewer or straight into a body of water, it usually brings pollution with it. When water enters a storm sewer (which is separate from a sanitary sewer) it leads directly to our waterways without going to a treatment plant. This is called Stormwater Runoff, or Urban Runoff when it occurs in an urban area. Urban Runoff is the number one type of stormwater pollution. This program will go over different types of pollution that can end up in our storm water and how that pollution accumulates in our waterways by defining what a watershed is. A watershed is an area of land that has high points and low points (picture a valley surrounded by mountains). Water will always flow from the high to the low because of gravity, which means water will flow from all over the mountains around this valley but end up in the lake in the middle. So, pollution can be carried from many different points, but end up collecting in one waterbody.

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**Sam the Sonoran Tiger Salamander**

# Lesson Overview

Students will learn about what a Watershed is and how we all live in one, and how our storm sewer system is a functioning part of a city's watershed. They will learn about different types of pollutants before creating their own watershed. Using that watershed, they will learn how these different pollutants accumulate in our water sources, and discuss how best to prevent that pollution from happening.

## Driving Question:

- How does pollution accumulate in our water systems?
- How can we prevent pollution?

## Learning Goals:

- Students will understand the impact of stormwater pollution on the environment, animals, and humans by using their paper watershed to visualize how pollution accumulates.
- Students will be able to name several different common types of stormwater pollution and how to prevent them.

## Standards:

### Core Ideas for Knowing Science

E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.

### Core Ideas for Using Science

U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.

U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.

### Science & Engineering Practices

- Asking Questions and defining problems
- Creating and observing models and communicating information

### Crosscutting Concepts

- Cause and effect
- Systems and system models

# Supplies

Students should be able to find supplies around the household:

- Cardstock (only if available)
- Printer paper (or notebook paper)
- At least one permanent marker or pen. Preferably three:
  - One black
  - One brown
  - One blue
- Washable markers
- Clear tape
- Spray bottle or cup or water

## Preparation

- Look over the power point beforehand to ensure that you're familiar with the lesson and the notes. It will also have the steps for the activity.
- Have the students collect what materials they can.
- They can complete the activity with the minimum of one piece of paper, a pen/ sharpie, washable markers, and water. The rest makes the watershed they will build more stable and clearly labeled.

## Instructions

1. Have the students be seated while you go over the powerpoint with them. The beginning section of the powerpoint is information to teach them about Stormwater, and the end section will walk you through the activity.

# Instructions (cont)

4. The student will take the printer/notebook paper and crumble it into a ball and then unroll it but DON'T smooth it flat. They are building a watershed, so the paper has to have high points and low points. This paper is going to represent mountains.
5. If they have a piece of cardstock, they can tape their crumbled paper to the cardstock for stability. They can also set it or tape it to a solid and dryable surface.
6. Next they will use their sharpies or pens to mark their watershed. Ensure that what they are using for this part is NOT washable.
7. Brown: use the brown markers to mark the high points. This represents their mountain tops.
8. Blue: use the blue markers to mark the low points. This represents their rivers and lakes. Where will water flow down their mountain? Where will it collect at the bottom?
9. Black: use the black markers to add cities and streets to the watershed. We are building an urban watershed, so we need to make it an urban environment.
10. Next they will use the washable markers. These markers represent the pollution that would be found in their watershed. Have them add a LOT of color to their wrinkled paper. The last part of the activity will be a lot more fun for them if there is a lot of color.
11. When they are done adding color their watershed, they will have a "rain storm". Using their fingers to flick water or a spray bottle, they will spray water on their watershed. The colorful markers they used for the pollution will start to run down the paper, and they'll see that water turn dirty from the pollution and collect at the bottom.

# Instructions (cont)

13. Discuss with the students what they saw and what that means and how important it is for us to keep the ground clean so that the water can stay clean as well. Ask them some ways that they can help keep stormwater clean (such as picking up trash, picking up dog poop, etc)

14. Discussion topics can include:

- When you sprayed the watershed, what did you see? What happened to all those colors that you'd added to the paper?
  - They can discuss how the color was pollution, so all the colors running together meant that all the pollution from the cities got washed into their lakes/rivers
  - When they are reminded that the color was pollution, go through the different types of pollution that were discussed previously in the presentation.
- Ask the students ways that they can help keep stormwater clean.
  - Picking up dog poop
  - Picking up litter
  - Telling friends/family about stormwater so that they won't litter
  - Not washing cars in the driveway
  - Don't wash leaves or dirt into the storm drain.

15. For 4th-6th graders, discuss with them the Stormwater Pollution Prevention Poster Contest! Winners will be featured in our calendar and receive a cool bag of prizes from our sponsors! Information can be found at:

<https://esd.maricopa.gov/2345/Poster-Contest>

16. Have students complete our survey online here <https://esd.maricopa.gov/FormCenter/Environmental-Services-16/Stormwater-Pollution-Awareness-Survey->