

ENVIRONMENTAL COMPLIANCE PRESENTS

# POLLUTION PREVENTION ENGINEERING

Engineer a Solution to Stormwater Pollution

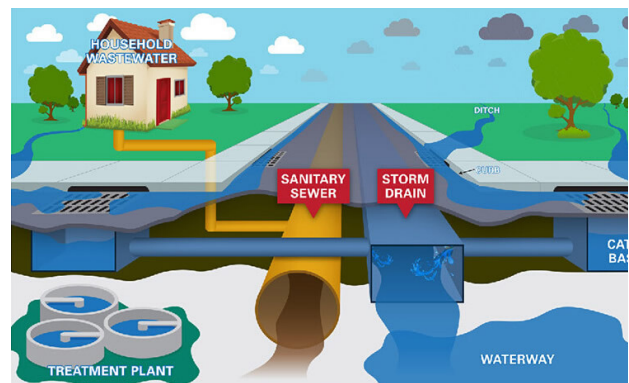


LEARN HOW TO PROTECT OUR WATER QUALITY

# STORM DRAINS

Before starting experiment, it is important to learn the basics about storm drains and their purpose.

## What is a storm drain?



A storm drain is a type of infrastructure put into place to capture and remove rain water during a storm. The main function of a storm drain is to remove water from the street so that flooding does not occur when it rains. The water that goes into storm drains is referred to as **stormwater**. It is important to note, this stormwater is not treated like waste water and is instead released directly into lakes, streams and parks.



# WHY STORM DRAINS

This fun interactive project will address what storm drains are, why we have them, and why it's important to prevent pollution.

## Why do we have storm drains?



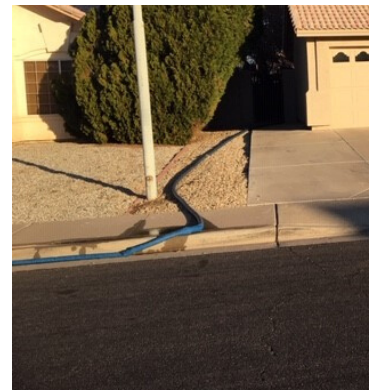
Storm drains are meant only to collect and divert rain to keep roads from flooding. Unfortunately rain water isn't the only thing going into these curbside devices. Litter, debris and other items make their way into drain which can cause blockages and flooding.



# WHAT SOME DO NOT KNOW..

Think about what else besides litter and yard waste could end up in the storm drain. Below are a few most do not think of.

## Items not captured by storm drains



Pollutants such as pesticides, herbicides, vehicle oil, soap from car washing, and chemicals from pool draining go directly into storm drain without treatment and into retention areas, lakes, rivers, etc.



# SUPPLIES NEEDED FOR FILTER SYSTEM

Collect things around your house to build your water filtration system. Keep in mind these items serve as the storm drain and should filter out pollutants. A few examples have been provided.

- water bottle - required
- coffee filter
- aluminum foil
- cotton balls
- dirt
- gravel
- toothpicks
- straws
- tissue
- styrofoam cup



# BUILD YOUR FILTER!

Now that you have an understanding of storm drains, and some of the challenges faced with preventing pollution to them, you will engineer a filter that could be used in a storm drain to help filter out all of the pollutants discuss above.

## Building water bottle filter

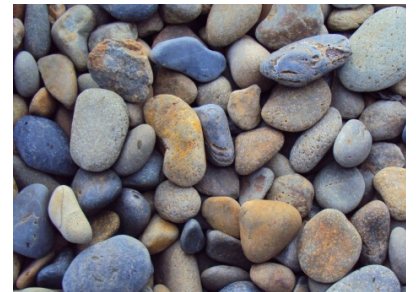
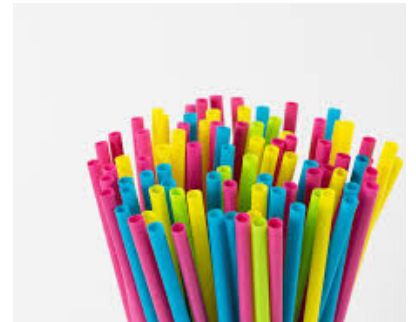


Cut the top off of a water bottle and invert the top into the bottom.  
This will serve as your storm water drain.



# FILTER COMPONENTS

To make this more of a learning experience, you may assign dollar amounts to each item and give the kids a budget in which they must stay under.



Think about what materials would remove the pollutants we said were harmful to water quality.



# SUPPLIES NEEDED FOR POLLUTED RAIN WATER

Create polluted rain water. Keep in mind that this water should have pollutants in it that would be picked up from the ground during a rain event. A few examples have been provided.

- dirt
- soap - car washing
- vegetable oil - leaking vehicles
- leaves/grass
- litter





# BUILD FILTER

Have kids use the filter material they purchased to engineer a filter that will remove the pollutants the best. Remind them that if too many materials are used, the water will drain too slowly (which in a real storm drain could cause street flooding).



# TESTING FILTER

Slowly pour polluted water that you created into the make shift storm drain filters. Make sure that litter and dirt is stirred well so that all pollutants make it into filter. Then watch the bottom of the water bottle to see how well their filters removed the pollutants.



# LESSONS LEARNED

After all polluted water has entered through the filter discuss with kids what they see and why they think that not all pollutants have been removed.



The lesson here is that even though they engineered a great filter system not all pollutants can be removed from storm water. This is why we need to prevent the pollution before it happens.



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