

TEACHER OVERVIEW

Water Quality
Kindergarten — 2nd Grade

Nature Vision Student Packet

The materials contained within have been created by Nature Vision, an environmental education nonprofit organization that brings programming to schools and local greenspaces for over 70,000 PreK-12th grade students each year in King and Snohomish Counties. This work from home curriculum materials packet is designed to foster an understanding of the importance of water and its integral role in supporting life and shaping our planet. Packets can be completed either independently, or with the help of an adult caregiver. Each day of the week offers materials building on previous days learning, offering a variety of activities including, art, writing, field exploration, and kinesthetic activities.

These materials are provided to you by City of Auburn Utilities, City of Bothell, City of Lynnwood, and grants from King County Flood Control District, and King County Wastewater Treatment Division. Learn more by visiting:

- City of Auburn Utilities: https://www.auburnwa.gov/city_hall/public_works
- City of Bothell: <http://www.bothellwa.gov/surfacewater>
- City of Lynnwood: <https://www.lynnwoodwa.gov>
- King County Flood Control District: <https://www.kingcounty.gov/services/environment/water-and-land/flooding/flood-control-zone-district.aspx>
- King County Wastewater Treatment Division: <https://www.kingcounty.gov/depts/dnrp/wtd.aspx>

Thanks to Cascade Water Alliance for providing the accompanying series of student packets: Ecosystems, Watersheds, and Humans and Water. To learn more please visit: <https://cascadewater.org/>.

This unit supports NGSS Performance Expectations across various disciplines, as well as supporting K-12 Integrated Environmental and Sustainability Standards. These are listed at the bottom of this page. Teachers will be supplied with PDF formats of materials to be emailed to families, or teachers may print and send to students to complete at home.

This packet begins with an overview of common sources of pollution in our daily lives, highlighting how these materials make their way into our waterways through stormwater and storm drains. Students then explore individual pollution sources, starting with those found in our yards like fertilizers, pesticides, and herbicides. They continue by looking at pollution from vehicles as well as animal waste. The packet concludes with a focus on stewardship and how students can help to keep stormwater free of pollution.

If you have any further questions or concerns regarding this packet, please email our Office Coordinator at info@naturevision.org.

Grades K-2

Supports NGSS Performance Expectations: K-ESS2-2, K-ESS3-1, K-EES3-3, K-2-ETS1-1, K-LS1-1, 2PS1-2.

Grades K-2
Day 1 - Pollution All Around
Day 2 - Pollution in the Yard
Day 3 - Car Pollution
Day 4 - Animal Waste
Day 5 - Stewardship

Stay connected with Nature Vision! Follow us for updates @naturevisionorg



PARENT/CAREGIVER OVERVIEW

Water Quality
Kindergarten — 2nd Grade

Welcome to Nature Vision's student packet for home use. Nature Vision is an environmental education nonprofit organization that brings programming to schools and local greenspaces for over 70,000 PreK-12th grade students each year in King and Snohomish Counties. We are excited to be offering this version of our programming directly to students at home!

This packet is designed to be completed over the course of one week, with each day focusing on a different aspect of environmental science and stewardship. The majority of these materials can be completed independently, but we thought it would be important to provide background information for any adults who may be helping to complete or answer questions. We've included the basic learning objectives for each day along with some vocabulary.

These materials are provided to you by City of Auburn Utilities, City of Bothell, City of Lynnwood, and grants from King County Flood Control District, and King County Wastewater Treatment Division. Learn more about caring for our water by visiting:

- City of Auburn Utilities: https://www.auburnwa.gov/city_hall/public_works
- City of Bothell: <http://www.bothellwa.gov/surfacewater>
- City of Lynnwood: <https://www.lynnwoodwa.gov>
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- King County Wastewater Treatment Division: <https://www.kingcounty.gov/depts/dnrp/wtd.aspx>

Challenge yourself to post all the things you are doing with your friends and family to prevent pollution and protect our water!

- City of Auburn Utilities: Tag @auburnwa and include the hashtag #auburnwa
- City of Bothell: Tag @BothellWaUSA and include the hashtag #PugetSoundStartsHere
- City of Lynnwood: Tag @LynnwoodWA and include the hashtag #Lynnwood
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NOTE: Students may require support in reading directions and/or completing some tasks. While many activities in this packet are creatively oriented and open ended, you may consult the answer key located at the back of the packet for additional assistance or guidance.

Unless otherwise noted, images courtesy of freepik.com

PARENT/CAREGIVER OVERVIEW: DAY 1

Pollution All Around

Background Information: Water is a shared resource for all living things, and it is our responsibility to ensure that water stays clean and safe. As water flows across the land, it gathers pollution of all kinds. This stormwater then flows into storm drains in our cities and towns, pouring directly into nearby bodies of water without being cleaned. This can be very harmful to other living things in the environment.

Learning Objectives: Students will learn about different kinds of pollution and identify how they mix with stormwater. They will recognize the negative impact that pollution can have on different living creatures, especially salmon.

Main Activity: Sad Salmon

- **Overview:** Students follow along with a story about a salmon swimming downstream, adding household ingredients to a water sample in order to simulate pollution that the salmon encounters
- **Parent/Caregiver Tasks:** Assist with gathering materials and provide supervision and cleanup help

Optional Activity: Water Pollution Word Search

- **Overview:** Students complete a word search full of vocabulary relating to the week's lessons
- **Parent/Caregiver Tasks:** None

Optional Activity: Stormwater Stewardship Challenge

- **Overview:** Students complete a daily stewardship challenge related to pollution prevention
- **Parent/Caregiver Tasks:** If possible, help the student share their work on social media

PARENT/CAREGIVER OVERVIEW: DAY 2

Pollution in the Yard

Background Information: People create pollution all the time, especially at home. In order to protect the plants in their lawns and gardens, they use many different chemicals that can negatively impact the environment when they become mixed into stormwater. Fertilizer can lead to harmful algae blooms in lakes and rivers, pesticide can kill insects that provide food for salmon, and herbicide can harm plants and animals throughout our waterways.

Learning Objectives: Students will be able to identify three of the most common sources of stormwater pollution: fertilizer, pesticide, and herbicide. They will understand why these chemicals are harmful and will learn ways to reduce their usage in the garden.

Main Activity: Problems in the Stream

- **Overview:** Students review a healthy stream ecosystem and identify plants and animals in it that could be harmed by fertilizers, pesticides, and herbicides in our stormwater
- **Parent/Caregiver Tasks:** None

Optional Activity: Follow the Pollution

- **Overview:** Students use different colors to trace the path of pollution from the garden to the storm drain to the pond
- **Parent/Caregiver Tasks:** None

Optional Activity: Stormwater Stewardship Challenge

- **Overview:** Students complete a daily stewardship challenge related to pollution prevention
- **Parent/Caregiver Tasks:** If possible, help the student share their work on social media

PARENT/CAREGIVER OVERVIEW: DAY 3

Car Pollution

Background Information: Cars are a major source of pollution in the Puget Sound region. Fluid leaks, soap from car washing, and improperly disposed car parts like tires and batteries can all affect our water quality. Stormwater runoff is not treated in our region. When rainstorms come, the rain washes these pollutants off the roads and sidewalks and into our wetlands and streams, leading straight to Puget Sound. When the water becomes polluted, animal and plant life is disrupted, causing food chain issues for all, including humans! We can reduce car pollution by performing regular vehicle maintenance, fixing leaks, and properly recycling items like car batteries and used oil. Other ways to reduce pollution from cars is to use public transportation, consider purchasing hybrid or electric cars, walking, or riding a bike instead of taking a car trip.

Learning Objectives: Students will learn what types of pollution come from cars and how it affects our water. Students will also be informed of the simple solutions that can prevent pollution from cars and also alternatives to cars as main mode of transportation.

Main Activity: Solutions to Pollution

- **Overview:** Students solve a puzzle to find the secret water quality message
- **Parent/Caregiver Tasks:** None

Optional Activity: Find What Doesn't Belong

- **Overview:** Students color in a picture and circle what doesn't belong in the creek
- **Parent/Caregiver Tasks:** None

Optional Activity: Stormwater Stewardship Challenge

- **Overview:** Students complete a daily stewardship challenge related to pollution prevention
- **Parent/Caregiver Tasks:** If possible, help the student share their work on social media

PARENT/CAREGIVER OVERVIEW: DAY 4

Animal Waste

Background Information: Animal waste is a big contributor to water pollution. Sources of animal waste are mainly from dogs and farms. The Puget Sound region has many farms with livestock in them which can lead to a lot of animal waste runoff when it rains, but the biggest problem in urban and suburban areas is dog poop. There are many dog owners in the cities around Puget Sound, and not picking up their pet waste is a big problem. When animal waste gets into our rivers and lakes, it can affect the water quality, causing harm to the plants and animals that live there. Animal waste contains lots of nutrients and organic material. When it enters the water, the material begins to break down and decompose. Too much decomposition can remove oxygen from the water, making it hard for aquatic life to breathe. The nutrients from the waste in the water can also lead to algal blooms, which can harm native plants and animals. Some algal blooms are toxic, such as blue-green algae. Animal waste also contains lots of bacteria that can cause diseases to both animals and humans!

Learning Objectives: Students will learn how animal waste affects water quality. They will learn the main ways that animal waste pollutes water, and what can be done to prevent this form of pollution. Students will understand the simple solutions to ensure animal and livestock waste is removed from surfaces and does not become stormwater pollution.

Main Activity: Going for a Walk

- **Overview:** Students play a dice and coin flip game where they go on a walk, encountering dog poop, and write a sentence summary after completing the game
- **Parent/Caregiver Tasks:** Help acquiring materials

Optional Activity: Dog Poop Maze

- **Overview:** Students solve a maze involving pet waste, a park, and a river where students choose the correct place to throw away the bag of pet waste
- **Parent/Caregiver Tasks:** None

Optional Activity: Stormwater Stewardship Challenge

- **Overview:** Students complete a daily stewardship challenge related to pollution prevention
- **Parent/Caregiver Tasks:** If possible, help the student share their work on social media

PARENT/CAREGIVER OVERVIEW: DAY 5

Stewardship

Background Information: Stewardship is how we care for the natural resources that all living things need to survive – such as water. Stewardship can include conservation of natural resources, and thinking and acting carefully about how we interact with the world around us. Humans impact their environment in many ways, both positively and negatively. A negative impact takes the form of pollution entering our environment. Stewardship remedies this impact and ensures a positive change that will keep our environment clean for all.

Learning Objectives: Students will combine their knowledge gained throughout the week to consider ways they can support the environment. They will learn to focus on pollution prevention by careful consideration of daily habits, behaviors, and usage of materials that will contribute to stormwater runoff pollution.

Main Activity: Match the Pollution to the Solution

- **Overview:** Students match pollution problems to their corresponding solutions
- **Parent/Caregiver Tasks:** None

Optional Activity: Stormwater Art

- **Overview:** Students create tie-dye style art while simulating stormwater pollution in the water
- **Parent/Caregiver Tasks:** Assist with acquiring materials, providing adequate space, and overall supervision

Optional Activity: Stormwater Stewardship Challenge

- **Overview:** Students complete a daily stewardship challenge related to pollution prevention
- **Parent/Caregiver Tasks:** If possible, help the student share their work on social media

PARENT/CAREGIVER OVERVIEW: VOCABULARY

DAY 1

Pollution: Unnatural contaminants introduced to the natural environment

Storm drain: A drain for large and excess amount of rainwater

Stormwater: Rainwater and snowmelt that flows over our land and city surfaces

DAY 2

Fertilizer: Chemicals that help plants grow

Habitat: The home of a plant or animal

Herbicide: Chemicals used to kill plants or weeds

Pesticide: Chemicals used to kill insects

DAY 3

Pollutant: A substance that is causing pollution

DAY 4

Decompose: To break down

Nutrients: A substance necessary for life to grow (vitamins, proteins, etc.)

Organic material: Material that comes from a living thing, like plants or animals that can decompose

DAY 5

Stewardship: Taking care of something; being a protector

DAY 1

Pollution All Around

Water in nature is shared by all plants, animals, and other humans. Whether it is flowing through a river, a lake, or down the sidewalk, we want to make sure there is always enough clean water for every living thing.

When water starts its journey by falling from the sky as rain or snow, it is fresh and clean. We call the water that falls and flows around us **stormwater**, and it usually does not stay clean for long. As the stormwater hits the ground and begins to flow, it picks up all of the small things that it touches. Sometimes there is **pollution** laying on the ground! Pollution doesn't come from nature but from humans. These are a few examples of pollution we find a lot of:



Home Car Washes



Dog Poop



Too Many Cars



Car Oil Leaks

When stormwater flows through a city or town, it can mix with a lot of pollution before it goes down into **storm drains**. Have you ever seen any storm drains like this in your neighborhood?

STORM DRAIN



Storm drains move the stormwater and pollution into a nearby stream, lake, river, pond, or ocean. This water is not cleaned by humans! Polluted stormwater going into our streams, lakes, rivers, ponds, and oceans makes the water very unhealthy for animals – like frogs and salmon. We need to take care of this water by keeping it clean for all living things!



This week we will explore many different kinds of pollution, learning about what they are and where they come from. By the time you complete this packet, you will have learned some fantastic new ideas for how to keep water clean!

Vocabulary

Pollution: Unnatural contaminants introduced to the natural environment

Storm drain: A drain for large and excess amount of rainwater

Stormwater: Rainwater and snowmelt that flows over our land and city surfaces

Main Activity

Sad Salmon

A young salmon is swimming downstream to reach the Puget Sound, but there is a lot of pollution along the way! Today you will follow the story of this salmon to build your own model of the stormwater and pollution that can be found out in nature.

Materials: Plastic container/tub/bowl, scissors, cardboard, paper, assorted kitchen ingredients, sponge (optional)

Please ask for an adult's permission to gather materials and for an appropriate space to build the model. The activity space needs to allow for potential spillage. Outdoor space would be ideal. Do not pour paper, oil, or any solid items down the drain.

- First, you must create your salmon. You can choose how you want to make it:
 - You can draw your own fish on a piece of cardboard and cut it out. You can use an old package, pizza box, cereal box, or any other cardboard you find.
 - If you have the materials and permission from your adult, you can even take a sponge and cut it into the shape of a fish!
 - If you are unable to make your own salmon, you can use a plastic toy instead. Do you have any small, plastic figures of a creature that lives in the water? Fish, frogs, whales, or anything else can work too!

2. Now that you have a salmon of your own, give it a name: _____.

3. Gather a few ingredients and items to represent different kinds of pollution. Here is a list of possible ingredients and the pollution that they can represent in the story:

ITEM	POLLUTION
Soap	Pollution from cars (oil, soap from washing, etc.)
Chocolate or cinnamon powder	Animal waste (poop)
Powdered drink mix, milk, or juice	Fertilizer (plant food)
Ripped up pieces of paper	Litter and trash

If you can't find these items, you can also be creative and come up with your own ideas!

- Fill your container or bowl halfway with water.
- Place your salmon in the water.
- Follow along with the story below, adding your "pollution" whenever the story tells you.
- After adding each kind of pollution, stir the mixture and think about your salmon. Does the water look clean and healthy? Do you think the salmon would be happy in water like that?
- After finishing the story, remove your salmon from the water.
 - How does your salmon look now? Has anything happened to it? How do you think a real salmon would feel?
 - If you made your salmon out of a sponge, squeeze out all of the water in it. What color was that final water?

Salmon Story:

There once was a young salmon that was born in a cool, crystal-clear river. As the salmon grew up, they decided to explore the world and swim to the ocean.

The salmon was young and strong, so they took off quickly down the stream. Soon they came to a part of the river near some houses with gardens full of fruits and vegetables! While they were admiring the plants, they noticed a lot of fertilizer, or plant food, washing into the water.

Pour 1 spoonful of milk, juice, or drink mix into the water!

The young salmon was determined to keep going! They saw a bridge up ahead, and as they swam underneath they felt something dripping from the road above their head. Some of the cars driving on the bridge were leaking all kinds of oil onto the road! That oil then went dripping down into the river.

Pour 1 spoonful of soap into the water!

All of this pollution was starting to bother the salmon. Slowly, they continued their journey. The river took them near a park where they saw lots of strange, furry, four-legged creatures. The salmon, with their strong sense of smell, noticed something stinky mixing into the water... the poop from those other creatures was slowly washing into the river when it rained!

Pour 1 spoonful of chocolate or cinnamon powder into the water!

The salmon was very tired at this point. As the river flowed through a small town, the salmon saw strange bits and pieces of metal, plastic, and paper floating around them. People were dropping their trash on the ground and letting it sweep into the water!

Pour some pieces of ripped-up paper into the water!

The salmon finally made it out to the ocean and swam as far away from all of the pollution as they could. They were safe for now, but knew that one day they would have to swim all the way back up the river in order to return home to spawn. They hoped that people would learn to keep water clean, or else it would be another very difficult journey for the salmon!

Optional Activity

Water Pollution Word Search

There are lots of words to remember when we are talking about pollution. Complete the word search below to remind you about some of the new words and phrases you are learning about.

Materials: Writing utensil

N M G L X W M Z X S O T G K C
A O Y Z Q Y A Z T Y I W D V N
D I I X K R E O E H L F F D A
T O J T I X R P L A N T S R E
L Q V V U M T T N R A I N A C
M Y E A W L S Y L A V N V I O
L R T A Q Z L S N I E C I N E
U E T J T G L O P H T L A J H
Y E Y L D I M D P B X T C R K
R R E Z I L I T R E F X E Z S
V V J M A R O U V F M K Z R A
L W V S E G V D U B U I E E D
C D T P I Q W S W N A E K T N
M T Q J R E H P M L B A A D W
T C W D E T S A W R L Q Q V Y

WORD BANK:

CARS
FERTILIZER
OCEAN
POLLUTION
SALMON

CLEAN
LAKE
OIL
RAIN
STORMWATER
WASTE

DRAIN
LITTER
PLANTS
RIVER
STREAM

Optional Activity

Stormwater Stewardship Challenge for Day 1

Do you have a great idea that you want to share about stormwater pollution? You can share ideas with other people with a public service announcement, or a PSA! A PSA is like a short news story. What would you share?

Materials: Writing utensil, computer/phone/tablet, internet connection

Write a PSA, a public service announcement, about stormwater pollution and storm drains. Use the space below if you'd like! The PSA should help other people learn something new.

Your PSA needs to be one to two sentences explaining why stormwater going down storm drains is a problem. Think of a short news story you might have seen on television or the internet while looking with an adult. Keep your sentences short and easy to read. Draw a picture if you would like to!

To share your work, post your challenge to Facebook and/or Instagram (**with an adult**) so other people in your community can learn, too! Don't forget to tag @naturevisionorg in your post! Do you live in Auburn, Bothell, Lynnwood, or King County? Use the hashtags and tag the city or county group below. They want to see all the work you are doing to keep our water clean!

- If you live in City of Auburn: Tag @auburnwa and include the hashtag #auburnwa
- If you live in City of Bothell: Tag @BothellWaUSA and include the hashtag #PugetSoundStartsHere
- If you live in City of Lynnwood: Tag @LynnwoodWA and include the hashtag #Lynnwood
- If you live in King County: Tag @KingCountyDNRP and @kingcountywtd

DAY 2

Pollution in the Yard

Pollution is not just found in our city streets, sidewalks, and parking lots — it can also be found at home. This week, we will learn about some of the most common types of pollution that can be found all around us. You don't need to travel very far to start seeing some examples of pollution! Many people use common items at home that can harm plants and animals if they end up flowing into rivers, streams, and lakes as stormwater pollution.

People love to have gardens with lots of flowers, fruits, vegetables, and more. Not only are our lawns and gardens wonderful places for people to visit and enjoy, but they also serve as **habitats**, or homes, for many different plants and animals. It is important that we learn how to keep water clean while we are caring for the living things in our gardens. Let's take a look at some common items that we use in our gardens and yards that can be part of stormwater pollution.



One kind of pollution that we often find is called **fertilizer**. Fertilizer is like food for plants because it helps them grow big and strong! When there is too much fertilizer, it can wash away in the rain and make other plants in lakes and rivers grow out of control. It can even cause a plant called algae to grow so thick that it covers the surface of a pond and prevents any other plants from growing!



Another kind of pollution is **pesticide**, or insect-killers. These are products that either kill insects or keep them away from your plants. You might not want insects eating all of the fruits and vegetables in your garden, but when pesticides end up in rivers, they can kill a lot of the creatures that salmon and other animals love to eat.



Finally, there is **herbicide**, or weed-killer! This is what people use to get rid of plants that they don't want in their yard. What do you think will happen to other plants in nature when these things wash away in stormwater?



Vocabulary

Fertilizer: Chemicals that help plants grow

Habitat: The home of a plant or animal

Herbicide: Chemicals used to kill plants or weeds

Pesticide: Chemicals used to kill insects

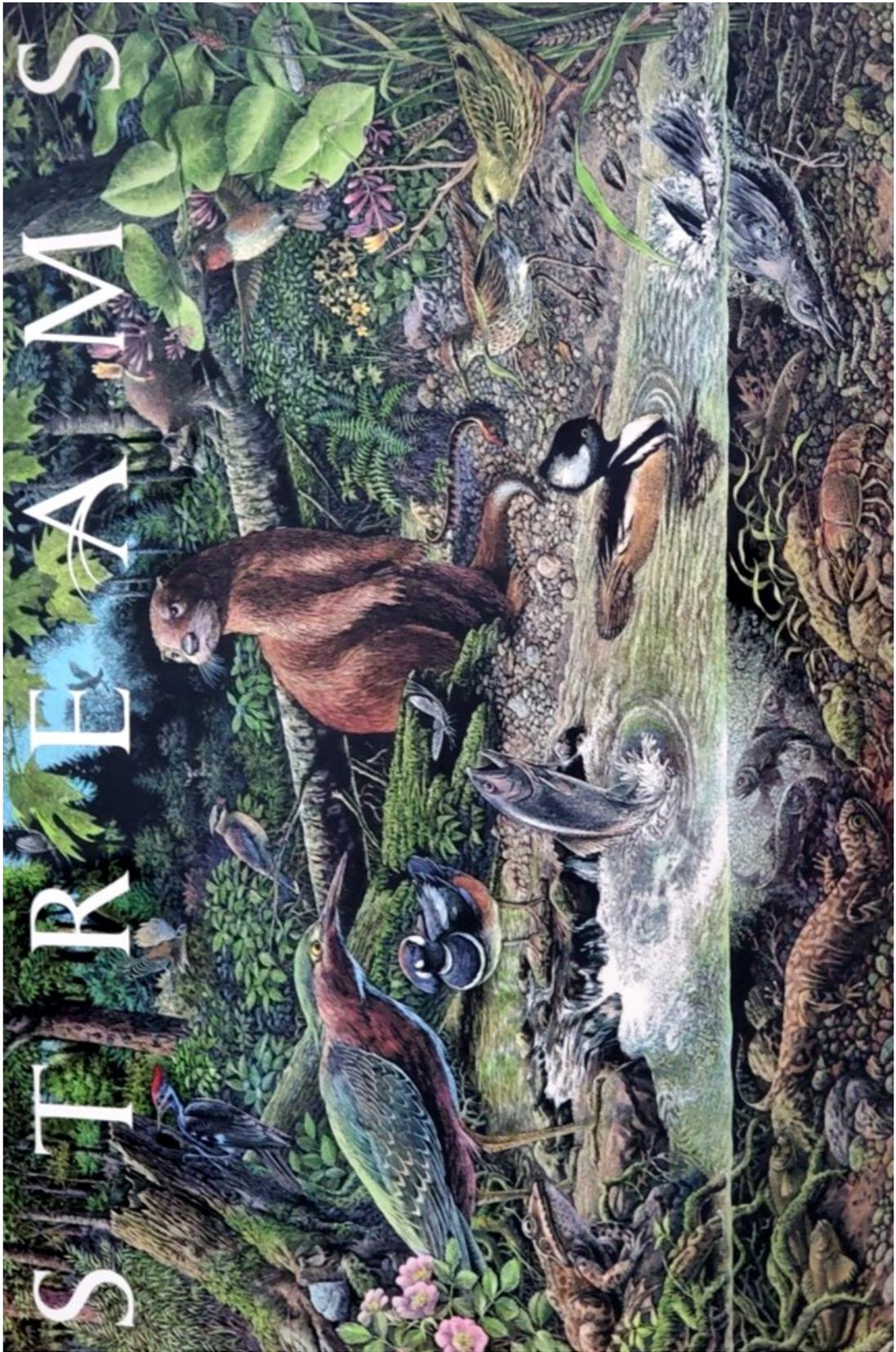
Main Activity

Problems in the Stream

Now that you've learned some about some different kinds of pollution that we find around our homes, we need to figure out how they actually affect other living things in nature. Today we will look at a healthy river habitat and figure out what could happen to all the plants and animals if we don't take good care of our water.

Materials: Writing utensil, colored pencils/markers/crayons (optional)

Take a look at the picture on the next page. It shows us a healthy and busy stream habitat, full of plants and animals. However, there is a pipe nearby that is pouring stormwater into this stream. Think about the different kinds of pollution that could be in that stormwater, and answer the questions that follow.



Source: Washington Department of Ecology

People in the nearby town have been using a lot of pesticides to keep insects from eating all of their fruits and vegetables. After a big rainstorm, most of the pesticides washed away with the stormwater and are now swirling around in the stream. Looking at the picture, find at least 2 living things that will be harmed by the pesticides in the water.

(Hint: Think about what pesticides do, as well as what some animals like to eat.)

Draw each of the living things you discovered. If you can, write the name of the plant or animal and explain how the pollution has affected them:

Draw what you found:	Do pesticides affect it?
	<hr/>

Draw what you found:	Do pesticides affect it?
	<hr/>

Insects aren't the only problem for gardeners; there are also lots of weeds, or unwanted plants, that keep trying to grow all over the place! To stop those weeds, people have been spraying herbicide on their lawns. It was raining lightly while they were spraying, causing a lot of that herbicide to flow down the storm drain. Looking at the picture, find at least 2 living things that will be affected by this kind of pollution.

(Hint: Don't just look at plants! You can also think about the animals that eat those plants.)

Draw each of the living things you discovered. If you can, write the name of the plant or animal and explain how the pollution has affected them:

Draw what you found:	Does herbicide affect it?

Draw what you found:	Does herbicide affect it?

Now that the gardeners have gotten rid of all the insects and weeds that were bothering them, they decided to make their plants grow as strong and healthy as possible! In order to do that, they sprinkled lots of fertilizer all around their lawns and gardens. It rained every day this week and the plants were happy for all of the water, but that also means that all of the extra fertilizer got washed away into the stream. That fertilizer then caused the algae in the water to grow very fast until it covered the surface of the water like a thick, green blanket. Looking at the picture, find at least 2 living things that might be affected by the fertilizer in our stormwater.

(Hint: Look at the creatures in the water – do you think they'd be happy if the surface was covered by plants?)

Draw each of the living things you discovered. If you can, write the name of the plant or animal and explain how the pollution has affected them:

Draw what you found:	Does fertilizer affect it?

Draw what you found:	Does fertilizer affect it?

Optional Activity

Follow the Pollution

Stormwater is full of chemicals and pollution that flows off of our lawns. Just one kind of pollution is unhealthy for plants and animals in the water, so imagine how bad it can be when they all get mixed together! Let's figure out how all of these things are ending up in our water.

Materials: Red, yellow, blue, and brown colored pencils/markers/crayons

The picture on the next page shows a home, maybe like one in your own neighborhood, that is using some different chemicals in their garden. You must trace the path of each kind of pollution, showing how it gets from the yard to the pond. Watch out for how they combine!

Draw a line to connect each piece of pollution to the pond it ends up in, passing through the storm drain on its way. You will need certain colors to show each kind of pollution.

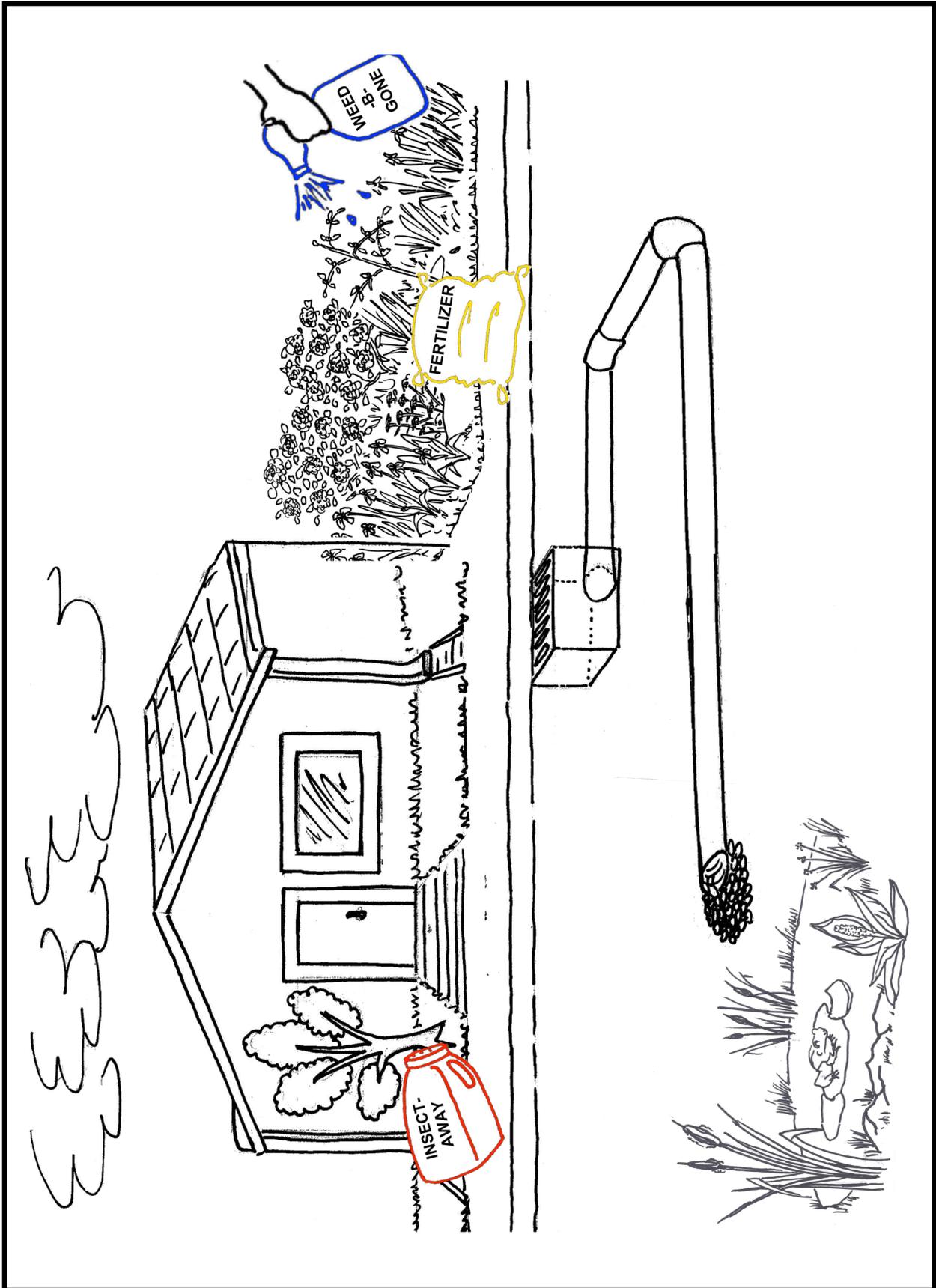
- Red = pesticide (insect-killer). Use red to show how pesticides travel to the storm drain when it rains.
- Yellow = fertilizer (plant food). Use yellow to show how fertilizer travels to the storm drain when it rains.
- Blue = herbicide (weed-killer). Use blue to show how herbicide travels to the storm drain when it rains.
- Brown = stormwater (everything combined). Use brown to show the pollution after it all combines in the storm drain.

Think about how these different kinds of pollution mixed together. See if you can figure out what the stormwater might look like if we took some of that pollution away.

What color would the water in the storm drain be if we removed the herbicide (weed-killer)?
Hint: Combine the colors for pesticide and fertilizer.

What color would the water in the storm drain be if we removed the pesticide (insect-killer)?
Hint: Combine the colors for herbicide and fertilizer.

What color would the water in the storm drain be if we removed the fertilizer (plant food)?
Hint: Combine the colors for pesticide and herbicide.



Optional Activity

Stormwater Stewardship Challenge for Day 2

A comic is a fun way to use pictures and words to tell a story. A comic is made by using squares to hold parts of the pictures and words. Each square tells a small part of the story.

Materials: Writing utensils, crayons/markers/colored pencils, computer/phone/tablet, internet connection, paper (optional)

Draw and write a comic about the stormwater pollution problem. The comic can have any people, animals, plants, places, and things you want to draw and write about! The comic should tell a story.

Here is an example of a comic that tells a story about how pollution going into storm drains is a problem!



Source: Memphis Stormwater

Time for you to draw and write your own! What story will you tell about stormwater pollution and storm drains? Who and what will you draw and write about? Make your stormwater and storm drain story into a fun comic!

Draw and write your own comic in the boxes below. You can use a few boxes or all of them.

To share your work, post your challenge to Facebook and/or Instagram (**with an adult**) so other people in your community can learn, too! Don't forget to tag @naturevisionorg in your post! Do you live in Auburn, Bothell, Lynnwood, or King County? Use the hashtags and tag the city or county group below. They want to see all the work you are doing to keep our water clean!

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- If you live in King County: Tag @KingCountyDNRP and @kingcountywtd

DAY 3

Car Pollution

Have you been in a parking lot and noticed dark spots on the ground? Do you ever see wet spots under cars? Have you seen the soap from someone washing a car go down the storm drain?



Cars and other machines cause a lot of pollution to our environment! Cars have lots of special liquids inside them that help make them work like oil, gasoline, brake fluid, and many others. Sometimes these liquids leak out onto the road. Some people also wash their cars in their driveways, which leaves the soap behind on the ground. Water cannot soak through concrete, so the **pollutants** sit there until they are washed away by the hose or by the rain. Then the pollutants get washed down the road to the storm drain and into our streams, lakes, rivers, and oceans!



When pollutants are in the water, it hurts the plants and animals that live there! Think of a swimming pool. Would you want to swim in a clean, clear pool? Or one that's dirty and full of trash and oil? We would all choose the clean pool, much like water animals want to have clean water. When the water is dirty, many smaller animals cannot survive, which means there's less food for big animals like orcas, whales, and seals. Many people also like to eat seafood like clams, fish, and crabs, which would mean that people are eating pollution. That's definitely not healthy!

Vocabulary

Pollutant: A substance that is causing pollution

Main Activity

Solutions to Pollution

Luckily, there are plenty of things you can do to help reduce car pollution:

- Fix leaks and drips from cars. If you notice a drip underneath your car, tell your adult so they can fix it.
- Wash your car at a professional carwash instead of the driveway or road. These carwashes are able to collect the pollution and clean it out before recycling the water.
- Ride the bus or carpool instead of driving. When we share rides together, there are less cars on the road, which means less pollution.

Let's get creative with using these solutions!

Materials: Writing utensil

Let's pretend that last night, a big rainstorm fell over Puget Sound. All the oil and soap on the street got washed away down the storm drain and into the water! You are a scientist helping to clean up the water from the pollutants on the street that were washed away into the water. After you've removed all the pollution, you notice a secret message from the water!

There are 3 different messages to solve below, each one with a message about solving car pollution:

- Each letter has a water icon or a type of pollution icon (oil and soap).
- To solve the message, cross out the letters with the pollution icons.
- Write the remaining letters on the lines below (in the same order) to see what the secret message is!

W	K	V	A	J	T	F	E	M	O	R	Q
											

W A T E R

F	Y	S	I	W	X	L	B	E	A	Q	P	K	S	M
														

What's a Solution to Car Pollution?

U	G	S	R	W	E	X	A	P
								

C	H	T	A	M	R	S	T	W	B	A	U	S	N	W	H
															

What's a Solution to Car Pollution?

R	Y	S	I	W	D	E	B	A	T	B	P	U	S	M
														

What's a Solution to Car Pollution?

Optional Activity

Find What Doesn't Belong

This stream has been polluted! Can you help circle the items that do not belong, so that we can help the stream be clean?

Materials: Writing utensil, crayons, markers, or colored pencils

Color in the picture, then circle the items that do not belong in the creek! Can you think of ways to solve the pollution here?

Can you find all of the things in the creek that do not belong?



Optional Activity

Stormwater Stewardship Challenge for Day 3

People often use stories to share information and teach each other, and have throughout history. These stories are known as fables, folk tales, and many other names.

Materials: Writing utensil, computer/phone/tablet, internet connection

Using what you have learned about stormwater and pollution so far, write a short fable to teach others about something they can do to help protect our environment. This story doesn't need to be set in the past, it can be a modern story or anything else you would like. Make it yours and have fun with it! If you would like to see some stories like this, **have an adult help you look here:** <https://www.kidsworldfun.com/shortstories.php>. Find someone to share your story with and explain how it can help them understand stormwater and ways that they can protect our environment!

To share your work, post your challenge to Facebook and/or Instagram (**with an adult**) so other people in your community can learn, too! Don't forget to tag @naturevisionorg in your post! Do you live in Auburn, Bothell, Lynnwood, or King County? Use the hashtags and tag the city or county group below. They want to see all the work you are doing to keep our water clean!

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DAY 4

Animal Waste

Do you have a dog? Have you driven past a farm and seen horses or cows? All animals, including us humans, produce waste or “poop”. Poop is full of **organic material** and nutrients that weren’t used by the body. Humans use the toilet to get rid of their waste, but what about animals? Some people have trained animals to use a litter box, but most animals poop outside.



In the Puget Sound region, many people have dogs and like to take them to parks or on walks or hikes. If those owners do not pick up their poop, it can cause a lot of pollution to our water! When animals poop the ground, it stays there until it gets picked up or until it rains and gets washed into the streams and lakes as runoff. The **nutrients** and **organic material** in animal poop can cause blue-green algal blooms, which makes the water unsafe to swim and play in. Animal poop also has lots of bacteria that can cause diseases which make people and other animals sick.



The best way to make sure animal poop doesn't get into the water is by picking it up! If you have a dog, always carry poop bags on your walks, and pick up the yard often. After it is in a poop bag, dog poop should always go in the garbage. Farmers can keep their animals' poop in piles to **decompose** in the air and use it as fertilizer for their plants!



Vocabulary

Decompose: To break down

Nutrients: A substance necessary for life to grow (vitamins, proteins, etc.)

Organic material: Material that comes from a living thing, like plants or animals that can decompose

Main Activity

Going For A Walk

Have you gone for a walk and seen dog poop that wasn't picked up? Maybe you notice it more in certain areas, like trails or sides of roads. If that poop isn't picked up, it can wash away in the rain go into our water!

Materials: Writing utensil, coin, 6-sided die (if you do not have one, you can ask a grownup for a random number between 1-6)

In this game, you are going for a walk in your neighborhood, or maybe on a hike, when you keep coming across opportunities for there to be dog poop on the ground.

Step 1: Begin at the "Start" on the board game.

Step 2: Roll the die. Move forward the number of spaces needed on the board game.

If you come across a dog poop marker, stop and follow the instructions in Step 3.

If you do not come across a dog poop marker, roll the die again.

Step 3: If you land on a dog poop marker as part of your move, **stop** and flip a coin!

If you get a heads with the coin, it means the dog poop got picked up by a responsible owner. Use a writing utensil to cross off the poop pile on the board game square.

If you get a tails with the coin, it means the dog poop was left behind and became pollution!

Step 4: Roll the die again! Follow step 2 or 3, depending on where you land on the board game.

Step 5: Repeat step 4 until you reach the end of your walk.

Step 6: At the end of your walk, or the end of the board game, count how many dog poop piles were picked up and **not** picked up. Write the number of dog poop piles in the "Number of Poop Piles" **Round 1** boxes below.

Step 7: Repeat Steps 1-6 again to do a second round. Write the number of dog poop piles in the **Round 2** boxes below. Was there a difference between the two rounds?

Step 8: Circle the correct "More" or "Less" for each round in the **More/Less** boxes below. Think of a reason why you picked up more or less dog poop along your walk in the story.

Step 9: On a real walk, why might you see less dog poop? What might remind people to always pick up dog poop so it doesn't become stormwater pollution? Could there be signs at the park? Do you have any other ideas?

Use this table to tally up your poop piles!

Round 1		Round 2	
Picked up	Not picked up	Picked up	Not picked up
There was MORE/LESS poop because:		There was MORE/LESS poop because:	

Going on a Walk Board Game

Start						
						
						
						
						
		End				

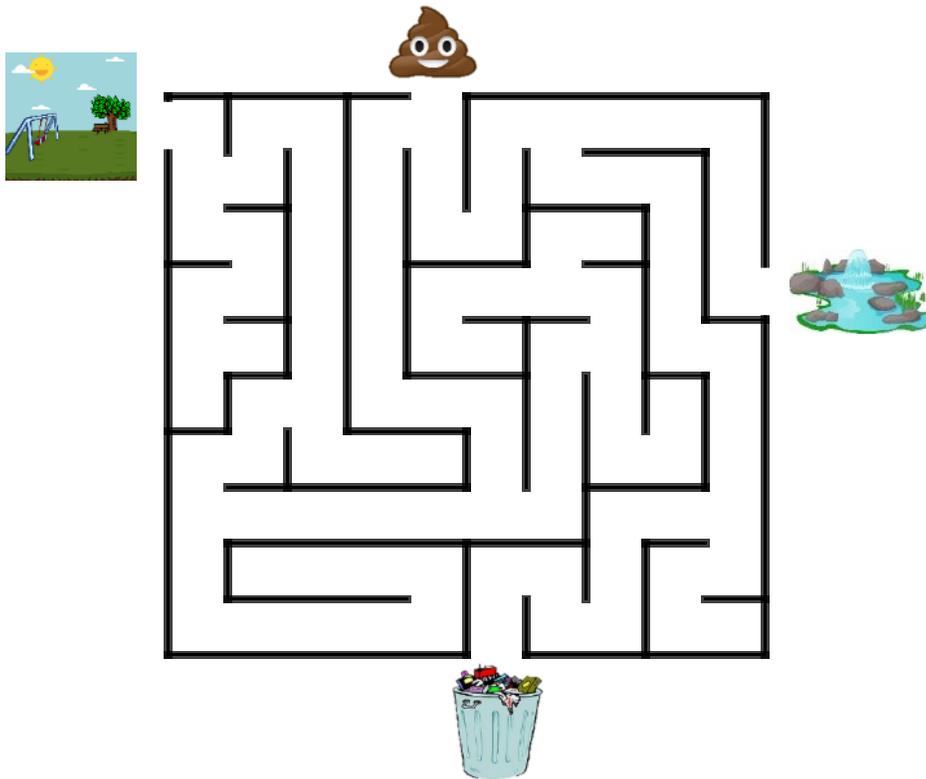
Optional Activity

Dog Poop Maze

Help the dog poop find the right place to go! Does it go in the park, the trash, or the river?

Materials: Writing utensil

Starting at the poop pile, find your way through the maze to the trash can. Make sure you don't accidentally end up in the river or get left behind at the park!



What happens if the poop goes in the wrong place?

Optional Activity

Stormwater Stewardship Challenge for Day 4

With so much going on in our environment, it's easy to feel like one person can't help much. Fortunately, when many of us work together, we can make big changes.

Materials: Writing utensil, crayons/markers/colored pencils, computer/phone/tablet, internet connection

For today's challenge, imagine what you could do if all of your friends and family near you were to volunteer for a project that you design. After what you've learned from this week's activities, what is something you could do? What would you need and who would you have do each part? Draw or write about your project below and share it with a friend or family member.

To share your work, post your challenge to Facebook and/or Instagram (**with an adult**) so other people in your community can learn, too! Don't forget to tag @naturevisionorg in your post! Do you live in Auburn, Bothell, Lynnwood, or King County? Use the hashtags and tag the city or county group below. They want to see all the work you are doing to keep our water clean!

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DAY 5

Stewardship

A lot has been covered this week on keeping our water clean and free of stormwater pollution! Making sure we don't leave pollution on our city's streets, sidewalks, driveways, and parking lots is a great way to keep our bodies of water healthy! Now is the time to take everything we learned about stormwater pollution going down storm drains and do our part to help. It is important to take action and learn about stewardship.

Stewardship means to take care of something. A steward is someone who is responsible for the care. If you care for our water and keep it clean, you are a steward! There are many things you can do to help keep stormwater pollution from going down storm drains. One of the best ways to be a steward is to think of the materials we use every day and how we can make sure to not leave them behind to become pollution.

Clean water is something that humans, animals, plants, and all living things need to be healthy. We can become stewards of our river, streams, lakes, and oceans by understanding solutions to the stormwater pollution problem!

Vocabulary

Stewardship: Taking care of something; being a protector

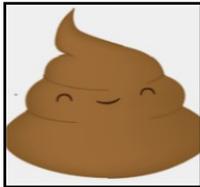
Main Activity

Match the Pollution to the Solution

Solutions are answers to a problem. We have learned that stormwater pollution is a big problem and makes our rivers, lakes, streams, and oceans unhealthy. Solutions to the stormwater pollution problems can be easy to do at home, school, and around your city!

Materials: Writing utensil

Match the *Pollution Card* to its correct *Solution Card* by drawing a line from one picture to another picture. Each Pollution Card has only one matching Solution Card.

POLLUTION	SOLUTION
	
Dog Poop	Walk and Bike More
	
Home Car Washes	Pick Up Dog Poop
	
Too Many Cars	Fix Car Leaks
	
Car Oil Leaks	Go to a Commercial Car Wash

Optional Activity

Stormwater Art

All of the pollution that ends up in stormwater is a very big problem for people, plants, and animals. Today you can try an experiment to show how different kinds of pollution mix together in our water, all while making a very cool art project!

Materials: Food coloring or liquid watercolor paint, paper cut into quarters, dishes and utensils (pie pan or baking dish, plates, small cups or bowls, forks, spoons)

With an adult, only do this activity in a sink, tub, or somewhere that is easy to clean! **DO NOT DRINK ANYTHING**. Leftover water at the end of the activity can be taken outside with an adult and poured over soil so we don't waste water.

1. Pour a thin layer of water in a shallow pie pan, plate, or baking dish. There should be just enough water to cover the bottom.



2. Add your colors: Place a few drops of each color in different parts of your container. Try not to let the colors swirl together!



3. Take your first piece of paper and carefully place it on top of the water. Leave it for 1 full minute and then pick it up.

- Set your paper aside to dry



4. The colors may have started to blend together now, just like different kinds of pollution swirling together in the water.



5. Take your second piece of paper and carefully place it on top of the water. Leave it for 1 full minute and then pick it up.

- Set your paper aside to dry



6. All of the colors should be well mixed at this point. Just to be sure, take a spoon and mix them together until you see only one color!



7. Take your third piece of paper and carefully place it on top of the water. Leave it for 1 full minute and then pick it up.

- Set your paper aside to dry



After all of your papers have dried, look at them together. Think about how the colors, just like pollution, started in different places. When the water moved, it brought them together, just like how stormwater picks up pollution from our roads, forests, and parks.

First Paper



Second Paper



Third Paper



Optional Activity

Stormwater Stewardship Challenge for Day 5

There are so many ways to protect and care for our water. At the end of every daily lesson, we will be giving a stormwater challenge to help you show off what you've learned.

Materials: (Optional) writing utensil, crayons/markers/colored pencils, computer/phone/tablet, internet connection

Using what you've learned this week on stormwater pollution, it's time to make your own Stormwater Challenge! Think about all of the things we learned this week. What new thing can you do to share what you know or new ways you've learned to keep our waterways clean?

To share your work, post your challenge to Facebook and/or Instagram (**with an adult**) so other people in your community can learn, too! Don't forget to tag @naturevisionorg in your post! Do you live in Auburn, Bothell, Lynnwood, or King County? Use the hashtags and tag the city or county group below. They want to see all the work you are doing to keep our water clean:

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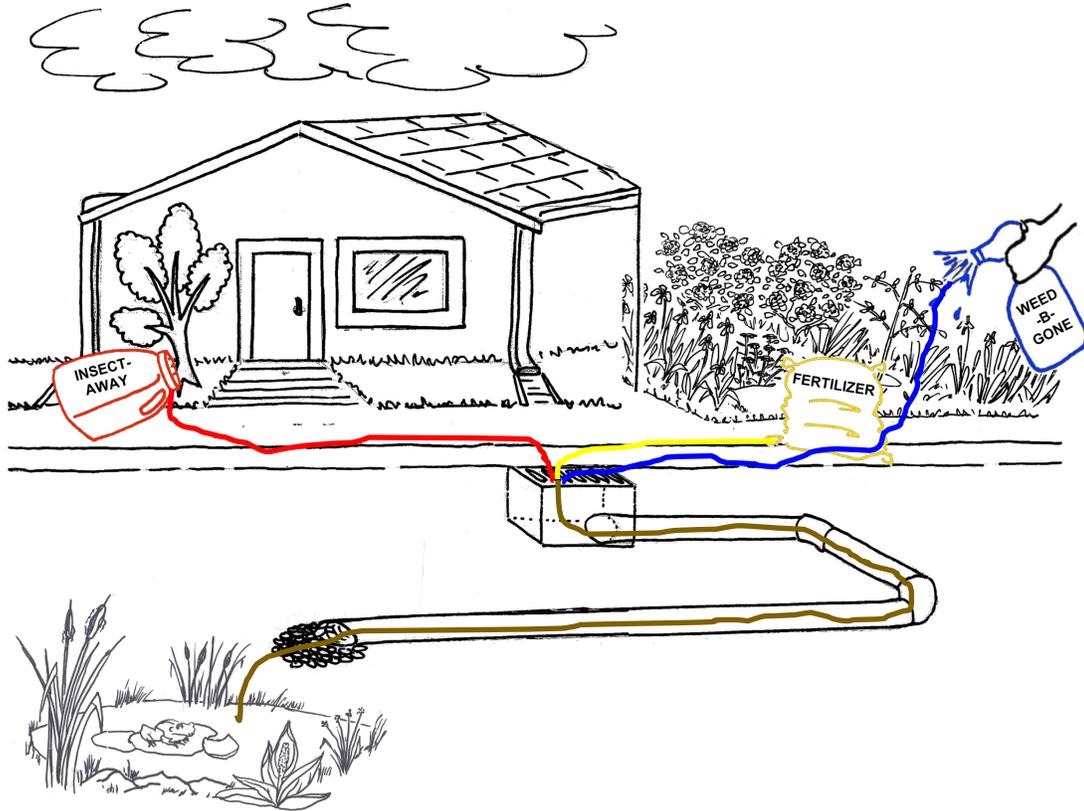
Answer Key

Optional Activity for Day 1: Water Pollution Word Search

N M G L X W M Z X S O T G K C
A O Y Z Q Y A Z T Y I W D V N
D I I X K R E O E H L F F D A
T O J T I X R P L A N T S R E
L Q V V U M T T N R A I N A C
M Y E A W L S Y L A V N V I O
L R T A Q Z L S N I E G I N E
U E T J T G L O P H T L A J H
Y E Y L D I M D P B X T C R K
R R E Z I L I T R E F X E Z S
V V J M A R O U V F M K Z R A
L W V S E G V D U B U I E E D
C D T P I Q W S W N A E K T N
M T Q J R E H P M L B A A D W
T C W D E T S A W R L Q Q V Y

Answer Key

Optional Activity for Day 2: Follow the Pollution



What color would the water in the storm drain be if we removed the herbicide (weed-killer)?
Hint: Combine the colors for pesticide and fertilizer

ORANGE

What color would the water in the storm drain be if we removed the pesticide (insect-killer)?
Hint: Combine the colors for herbicide and fertilizer

GREEN

What color would the water in the storm drain be if we removed the fertilizer (plant food)?
Hint: Combine the colors for pesticide and herbicide

PURPLE

Answer Key

Main Activity for Day 3: Solutions to Pollution

F	Y	S	I	W	X	L	B	E	A	Q	P	K	S	M
														

What's a Solution to Car Pollution?

F I X L E A K S

U	G	S	R	W	E	X	A	P
								

C	H	T	A	M	R	S	T	W	B	A	U	S	N	W	H
															

What's a Solution to Car Pollution?

U S E A C A R W A S H

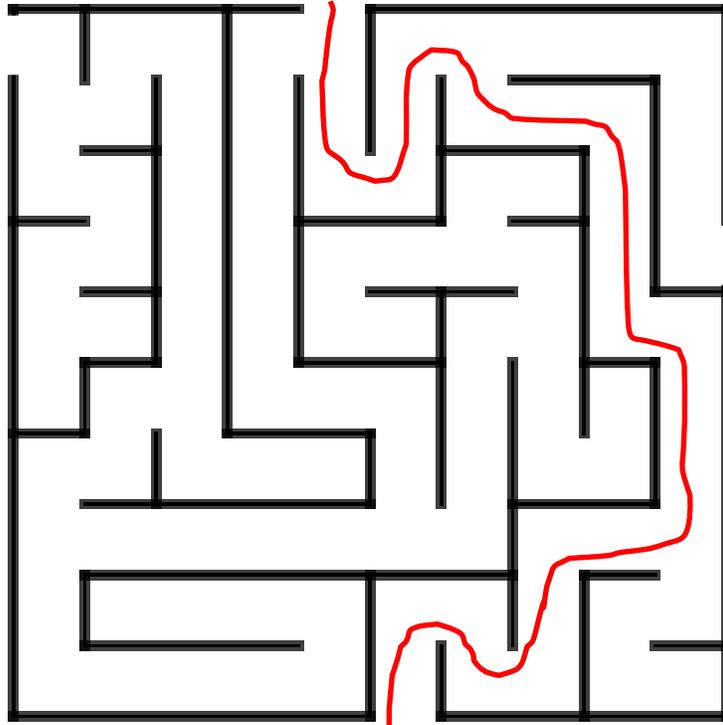
R	Y	S	I	W	D	E	B	A	T	B	P	U	S	M
														

What's a Solution to Car Pollution?

R I D E A B U S

Answer Key

Optional Activity for Day 4: Dog Poop Maze



Answer Key

Main Activity for Day 5: Match the Pollution to the Solution

POLLUTION

SOLUTION



Dog Poop



Walk and Bike More



Home Car Washes



Pick Up Dog Poop



Too Many Cars



Fix Car Leaks



Car Oil Leaks



Go to a Commercial Car Wash