

TEACHER OVERVIEW

Water Quality
3rd — 5th 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/Home>
- 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.

Stormwater impacts our water quality in a big way. Students will begin with a basic explanation of stormwater and water quality. Next they will explore the ways that our yards, vehicles, and pets impact water quality, Last, students will focus on ways that we can help improve and care for the water from our homes and neighborhoods.

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

Grades 3-5

Supports NGSS Performance Expectations: 3-LS4-4, 3-ESS3-1, 4-ESS3-2, 4-ESS3-2, 5-ESS2-1, 5-ESS3-1, 3-5-ETS1-2.

Grades 3-5
Day 1 - Water Quality Basics
Day 2 - Yard Waste
Day 3 - Vehicles, Roads, and Driveways
Day 4 - Pet Waste
Day 5 - Stewardship

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PARENT/CAREGIVER OVERVIEW

Water Quality
3rd — 5th 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
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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

Water Quality Basics

Background Information: Water quality is the way that we measure the health of our water and its ability to support life. Because our storm drains lead directly to sources of freshwater, our actions have a big impact on that water quality. We generally consider two types of pollution when discussing water quality: point source and non-point source pollution. Point source pollution comes from one major source. Non-point source pollution is a combination of smaller sources of pollution from numerous places. Because it is harder to trace and stop pollution coming from multiple places, the combination of smaller, individual pollutants of non-source pollution generates a bigger, more complex problem to solve.

Learning Objectives: Students will learn about water quality, the differences between point and non-point pollution, and explore ways that each can be managed.

Main Activity: River Pollution Puzzle

- **Overview:** Students piece together a puzzle involving sources of pollution and are given the opportunity to “clean” certain areas
- **Parent/Caregiver Tasks:** If needed, assist with set up and gameplay

Optional Activity: Is This Water Polluted?

- **Overview:** Students experiment with adding various materials to water to understand that contaminated water can be difficult to identify
- **Parent/Caregiver Tasks:** Provide supervision

Optional Activity: Stormwater Stewardship Challenge

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

PARENT/CAREGIVER OVERVIEW: DAY 2

Yard Waste

Background Information: Yard waste creates nearly 60% of water quality issues from our neighborhoods. The movement of fertilizers and pesticides into our water has a largely negative impact on local plants and wildlife. These harmful chemicals make it harder for the bodies of freshwater to support the life living within them. Luckily, people can help prevent yard waste from contaminating our water.

Learning Objectives: Students will learn about yard waste as a source of pollution, the potential impact of the different types of yard waste, and some of the ways that we can help solve this issue.

Main Activity: Lawn Care Match-Up

- **Overview:** Students trace and write a story about a source of pollution, it's negative impact, and a possible solution
- **Parent/Caregiver Tasks:** None

Optional Activity: Starting at Home

- **Overview:** Students explore their homes or neighborhood — or draw on previous experience — to consider various sources of pollution from lawns, yards, and gardens
- **Parent/Caregiver Tasks:** Provide supervision

Optional Activity: Stormwater Stewardship Challenge

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

PARENT/CAREGIVER OVERVIEW: DAY 3

Vehicles, Roads, and Driveways

Background Information: Our driveways, cars, and roads are big sources of pollution from oil, gasoline, and other petroleum products. These chemicals are both harmful and difficult to control because they spread over large distances in our water. These materials can easily enter storm drains from our streets and impact local bodies of freshwater, especially when it rains. Planting trees, plants, and bioswales (i.e. ditches with plants and soil) help in filtering out these harmful pollutants before they reach our water.

Learning Objectives: Students will learn about the ways that oil and gasoline can impact our water before exploring ways that we can reduce these issues.

Main Activity: Design a Street for Safer Stormwater

- **Overview:** Students draw various sources of pollution on a neighborhood street, adding in various elements to try and reduce this problem
- **Parent/Caregiver Tasks:** Help with directions and provide support

Optional Activity: Oil and Water

- **Overview:** Students create a project to illustrate that oil and water do not mix
- **Parent/Caregiver Tasks:** Provide supervision

Optional Activity: Stormwater Stewardship Challenge

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

PARENT/CAREGIVER OVERVIEW: DAY 4

Pet Waste

Background Information: Our pets are not a part of the natural environment, and their waste can be an environmental problem if it enters our water sources. For instance, dogs can transmit *E. coli* bacteria to the water and make plants and animals that rely on that water sick. People can easily prevent pet waste from winding up in our region's water.

Learning Objectives: Students will explore ways to manage pet waste. Additionally, they will understand how much waste household pets can create each year to put the issue of pet waste into perspective.

Main Activity: Scoop the Poop Game

- **Overview:** Students play a board game illustrating the actions we should take to help manage pet waste and the impacts we can have on the environment if we do not
- **Parent/Caregiver Tasks:** Assist with game set up and directions

Optional Activity: Pet Waste Calculator

- **Overview:** Students estimate the amount of waste that their dog — or that of a friend or neighbor — can create in one year
- **Parent/Caregiver Tasks:** If needed, help with calculations

Optional Activity: Stormwater Stewardship Challenge

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

PARENT/CAREGIVER OVERVIEW: DAY 5

Stewardship

Background Information Stewardship is the way that we care for our environment. In the case of stormwater, contamination from our lawns, roads, and pets can have harmful impacts on our environment. Fortunately, we can reduce our impact in these areas easily by using best management practices.

Learning Objectives: Students will explore different ways to keep our water clean and healthy.

Main Activity: Pollution Scavenger Hunt

- **Overview:** Students explore their homes and neighborhoods to locate possible sources of pollution and consider ways they could use best management practices to solve the problem
- **Parent/Caregiver Tasks:** Provide supervision while outdoors

Optional Activity: Household Discussion

- **Overview:** Students discuss what they have learned with their family/household and consider ways they can help improve water quality together
- **Parent/Caregiver Tasks:** Participate in the discussion with your student

Optional Activity: Stormwater Stewardship Challenge

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

PARENT/CAREGIVER OVERVIEW: VOCABULARY

DAY 1

Contaminated: Made dirty by pollution

Non-point source: Small amounts of pollution from many different places

Pollution: Things that make our air and water dirty or harmful

Point source: Large amounts of pollution from one place

Stormwater: Water from rainfall, ice and snow melt

Water quality: How clean or dirty water is

DAY 2

Fertilizer: Chemicals that help grass grow

Pesticides: Chemicals that kill weeds and/or insects

Runoff: Stormwater that travels over the surface of the earth

DAY 3

Bioswales: Channels designed to concentrate and convey stormwater runoff while removing debris and pollution

Petroleum: Used to produce fuels including gasoline, kerosene, and diesel oil

DAY 4

Bacteria: Small organisms, or living things, that can be found in all natural environments that are made of a single cell and can be seen only with a microscope

E. coli: A bacteria commonly found in the intestines of humans and other animals, where some strains can cause severe food poisoning

Fecal bacteria: Bacteria found in feces or fecal matter

Feces: Waste matter discharged from the bowels after food has been digested; poop

DAY 5

Best Management Practices (BMPs): Methods that have been determined to be the most effective and practical means of preventing or reducing non-point source pollution to help achieve water quality goals

Stewardship: Caring for the environment; being a steward

DAY 1

Water Quality Basics

All living things need clean water to survive. However, not all the water on our planet is the same. Some water sources are cleaner, safer, and healthier for plants and animals than other sources. We measure the safety of our water by testing the **water quality**. This is done by checking the temperature, how clear the water is, and how much oxygen is in the water. We also check for **pollution**, things that make water dirty and unsafe for us and for other plants and animals that need water to survive. The water from our homes, lawns, and streets, in addition to the water that falls from the sky as precipitation, is called **stormwater**. What happens to our stormwater can have a big impact on its water quality. It is important for us to do what we can to make sure to keep water as clean as possible when it goes to the plants and animals that need it.

There are two main ways water can become **contaminated** — or made dirty from pollution. These two types of pollution are **point source** pollution and **non-point source** pollution. Point source pollution is when the contamination comes from a single place. One way to remember this is that you could use your finger to point to the single cause of pollution. An example of point source pollution is when the water near a factory becomes polluted. Non-point source pollution is when smaller amounts of pollution from lots of different places combine in one body of water. This typically occurs when smaller amounts of pollution from all over are carried by our stormwater to combine in a larger body of water, where it becomes harder to figure out where the pollution came from.

Vocabulary

Contaminated: Made dirty by pollution

Non-point source: Small amounts of pollution from many different places

Pollution: Things that make our air and water dirty or harmful

Point source: Large amounts of pollution from one place

Stormwater: Water from rainfall, ice and snow melt

Water quality: How clean or dirty water is

Main Activity

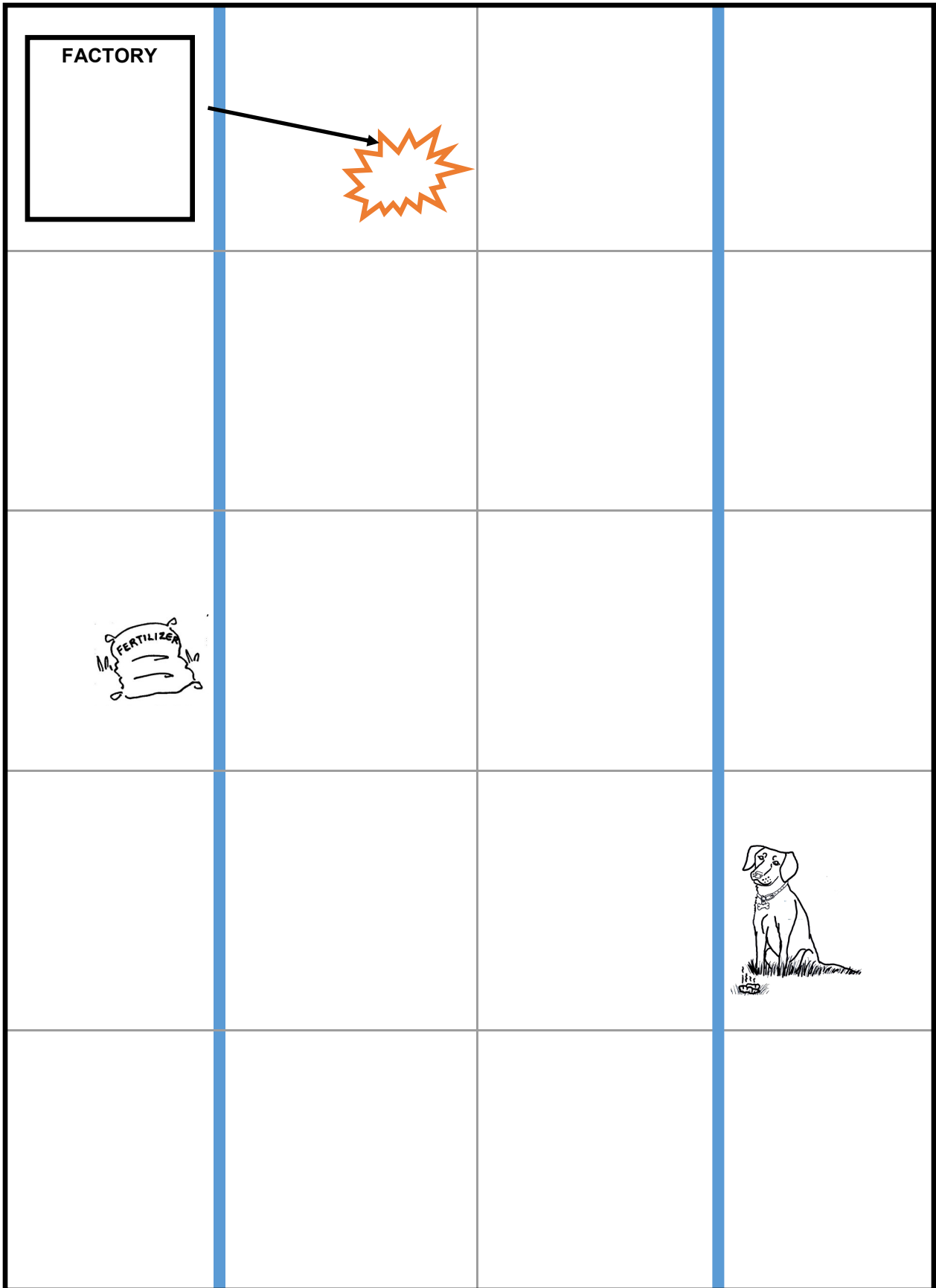
River Pollution Puzzle

More than 60% of water pollution comes from things like runoff from homes, lawn care chemicals, and pet waste. All these sources add up to a bigger pollution problem. Since non-point source pollution comes from many different places, it can be difficult to find the cause and clean up the issue. This activity allows you to create your own river environment and see the ways that cleaning up all these different sources of pollution can be difficult.

Materials: Writing utensil, scissors, paper

Instructions:

1. Print out the example design on the following page or draw your own version on a piece of blank paper. You should have 10 different sections. As shown in the example design, you can draw straight lines instead of wavy lines for the river to make this easier.
2. Choose one square to draw a source of point pollution, like a factory.
3. Choose 6 squares to draw non-point pollution sources, such as litter, pet waste, gasoline from a driveway, fertilizer (i.e. chemicals to help plants grow) pesticides (i.e. chemicals to kill weeds and insects) or oil from a road.
4. Cut each square apart so you have 10 cards total (i.e. 7 that have sources of pollution and 3 that do not).
5. Turn the cards face down, shuffle/mix them up, and then draw 6 of these cards.
6. Use the cards that you picked to rebuild the river. What sources of pollution are present in the river?
7. Choose three cards to “clean up” by turning them upside down, replacing them with an available card without pollution, or using another piece of paper to mark them “clean”.
8. Repeat this process two more times. Think about how your river pollution is different for rounds 2 and 3, then answer the questions at the end of this activity.



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Questions:

Were you able to clean the entire river?

If not, which sources of pollution did you focus on?

Is it easier to remove all of the “point source” or “non-point sources” of pollution?

How do you think these sources of pollution might affect fish, plants, or other wildlife?

How do you think this model relates to the water in our region or watershed?

Optional Activity

Is This Water Polluted?

It's not always easy to tell if our water is contaminated. Water can be polluted even if there is no visible problem. Today you'll use your senses to discover different sources of "contamination".

Materials: 3 containers, water, salt, food coloring/soy sauce, vinegar/lemon juice

Follow these instructions to conduct an experiment with "contaminated" water:

1. Pour clean water into each of your containers, filling them half way.
2. Add "pollution" to your water by putting food coloring in one cup, salt in another, and vinegar in another.
3. Observe each sample. Can you tell that each is polluted using only your sight or smell?
4. For an added challenge, ask someone else to make a "mystery sample". Can you figure out what is in this water?

Optional Activity

Stormwater Stewardship Challenge for Day 1

Do you have a great idea that you want to share about stormwater pollution? A creative way to share information with other people is through a public service announcement, which is like a short news article with few important details.

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

Write a public service announcement (PSA) about the problem of stormwater pollution going down storm drains and into our waterways. The PSA should teach your community something new or remind people why stormwater pollution is an issue.

Your PSA needs to be a few sentences explaining the stormwater pollution problem. The best public service announcements are short and simple. Consider an eye-catching title that draws your reader to the main message. Optional: include a picture to help people better understand and *remember* your PSA for the future. Feel free to use the space below!

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

DAY 2

Yard Waste

Our yards, lawns, gardens, and other areas near our homes have become some of the main sources of polluted stormwater **runoff**. This means they have a negative impact on our water quality. People sometimes use **fertilizers** (i.e. chemicals that help grass grow) and **pesticides** (i.e. chemicals that kill insects and weeds) in their yards. By doing so, both of these chemicals can enter our streams and rivers when it rains. This makes the water dangerous for living things living in it or depending on it for survival.

For example, when fertilizers get in our stormwater, algae in freshwater sources can grow too fast. The increase in algae makes it difficult for fish and other animals to survive in the water. Additionally, pesticides entering our water can make plants and animals sick because pesticides are poisonous to the living things that rely on this water.

We can help to make sure that these things do not enter our stormwater by being careful about how we care for our lawns. When possible, using organic materials like compost and grass clippings to fertilize our lawns and gardens is much better than using chemical fertilizers or pesticides. Compost and grass clippings will help your lawn like fertilizers and pesticides will while not polluting stormwater. Alternatively, using “natural” or “eco-friendly” products is gentler on the environment. These products should still be applied carefully, and they should never be applied to the parts of your lawn near storm drains that will carry it to our water.



Vocabulary

Fertilizer: Chemicals that help grass grow

Pesticides: Chemicals that kill weeds and/or insects

Runoff Stormwater that travels over the surface of the earth

Main Activity

Lawn Care Match-Up

Let's figure out how well we know what each type of yard pollution does to our water sources by playing a matching game and writing a story!

Materials: Writing utensil

Can you match the source of pollution, possible impact to the environment, and lawn care tip to solve the problem? Draw a line from the source of the problem to its water quality impact, then to its solution! After you have found the source, impact, and solution, write a short story or make your own comic about someone finding and fixing one of the following water quality problems in their own yard or neighborhood.

Source of Pollution	Water Quality Impact	Solution
Weed Killer	Too many nutrients means too much algae in freshwater	Avoid pesticides if possible especially near storm drains
Chemical Fertilizers	Poisonous to water bugs, fish, and animals	Pull weeds by hand if needed
Pesticide	Poisonous to native water plants	"Grasscycle" by leaving grass clippings after mowing

Short Story:

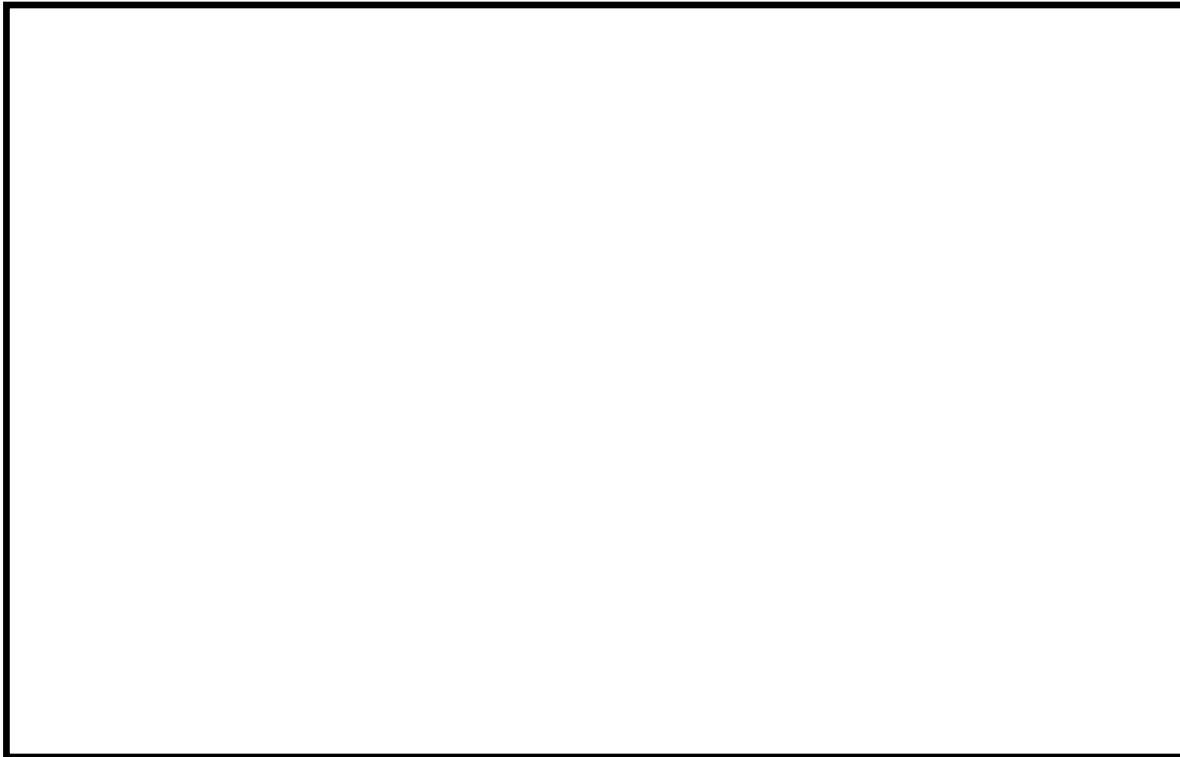
Optional Activity

Starting at Home

Figuring out what is happening at your home is the first step to deciding ways that you can help be a part of the solution.

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

If you can, **with an adult**, carefully explore the area around your home. Draw a picture of your environment with the ways that you think stormwater will travel near your home. Answer the questions that follow.



Where will it come from?

Where is the closest storm drain?

What might travel through that storm drain?

Talk to the adults in your family about ways that they take care of the space around your home. What do they know about how runoff impacts our freshwater?

Optional Activity

Stormwater Stewardship Challenge for Day 2

Comic strips are a fun way to communicate a story or ideas by using pictures and words. A comic is made using squares to tell pieces of the story. The comic strip can include multiple separate squares with characters, drawings, and descriptions to connect the story.

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

Make a comic strip that tells a story about the stormwater pollution problem. The comic strip can have any characters you want to include! The comic strip needs to include drawings and words. Use words to show what the characters are saying or to describe something happening in the comic strip square.

Here is an example of a comic strip about how only rainwater should go down storm drains:



Source: Memphis Stormwater

Time for you to make your own comic strip! How can you draw and write about stormwater pollution and storm drains as a story in your own comic strip? Who or what will be your main characters – will they be humans, animals, plants, or human-made things? Make your comic strip creative and fun to read!

Make your comic strip in the boxes below:

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 3

Vehicles, Roads, and Driveways

Our cars and driveways can be a source of water pollution from multiple sources. Cars require **petroleum**, a chemical used to make motor oil, gasoline, and other things that can be toxic or harmful to the environment. Even electric cars require motor oil and other things that can cause pollution. If we have leaky cars — or accidentally spill these harmful things in our driveways — they will be carried to our storm drains and into the nearest body of water.



Oil and gasoline can be especially difficult because they sit on top of the water, spreading out over a large distance. Did you know that 2 cups of oil can spread over *one acre* of water? That's almost the size of a football field!

Together, we can help make sure that our driveways and roads are as clean as possible by checking cars for leaks, and by being very careful to avoid spilling chemicals or gasoline.

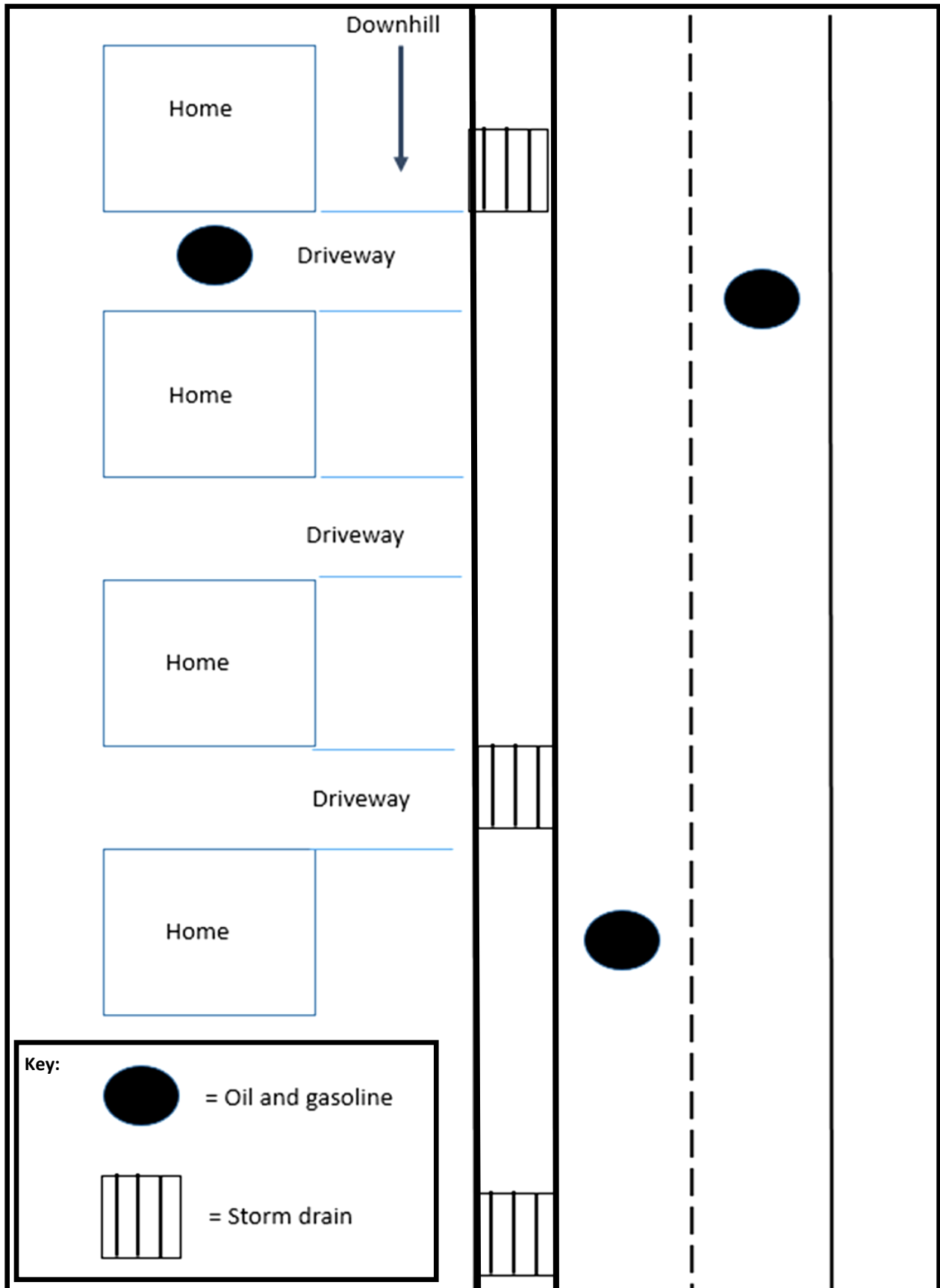
Unfortunately, even if we are really careful, there will still be some pollution from our roads and the vehicles that drive on them. One thing that people have tried to keep our stormwater free of gasoline, oil, and other chemicals is to create **bioswales**. Bioswales are areas on the side of the road that help to slow down and filter the water from our streets before they reach a storm drain. Gasoline, oil, and other forms of pollution flow into the bioswale where they soak into the ground and are filtered by the soil rather than going into storm drains. Having other vegetation like trees and grass also help slow down water flowing through our streets and driveways.



Vocabulary

Bioswales: Channels designed to concentrate and convey stormwater runoff while removing debris and pollution

Petroleum: Used to produce fuels including gasoline, kerosene, and diesel oil



Optional Activity

Oil and Water

To understand how oil is a contaminant in water, let's do an experiment to see how oil and water don't mix!

Materials: Clear bottle, vegetable oil, water, food coloring/liquid water color, towels

Make sure that you have adult permission, have towels nearby, and are working in a sink, tub, or large plastic container so that the project does not make a mess!

Follow these steps to see what oil mixed with water looks like:

1. Carefully fill a plastic bottle halfway with vegetable oil.
2. Fill the rest with water.
 - What happens to the oil when you add the water?
3. Add a few drops of food coloring or liquid water colors to the bottle.
 - What happens to the coloring as it moves through the oil?
 - What happens when it reaches the water?
4. Tightly secure the bottle top. (Consider gluing the top in place to avoid spilling).
5. Shake the bottle to mix the oil and colored water.
 - Do these materials mix together? How long does it take them to separate?
 - What can this tell us about how oil from our cars impacts our freshwater?



Optional Activity

Stormwater Stewardship Challenge for Day 3

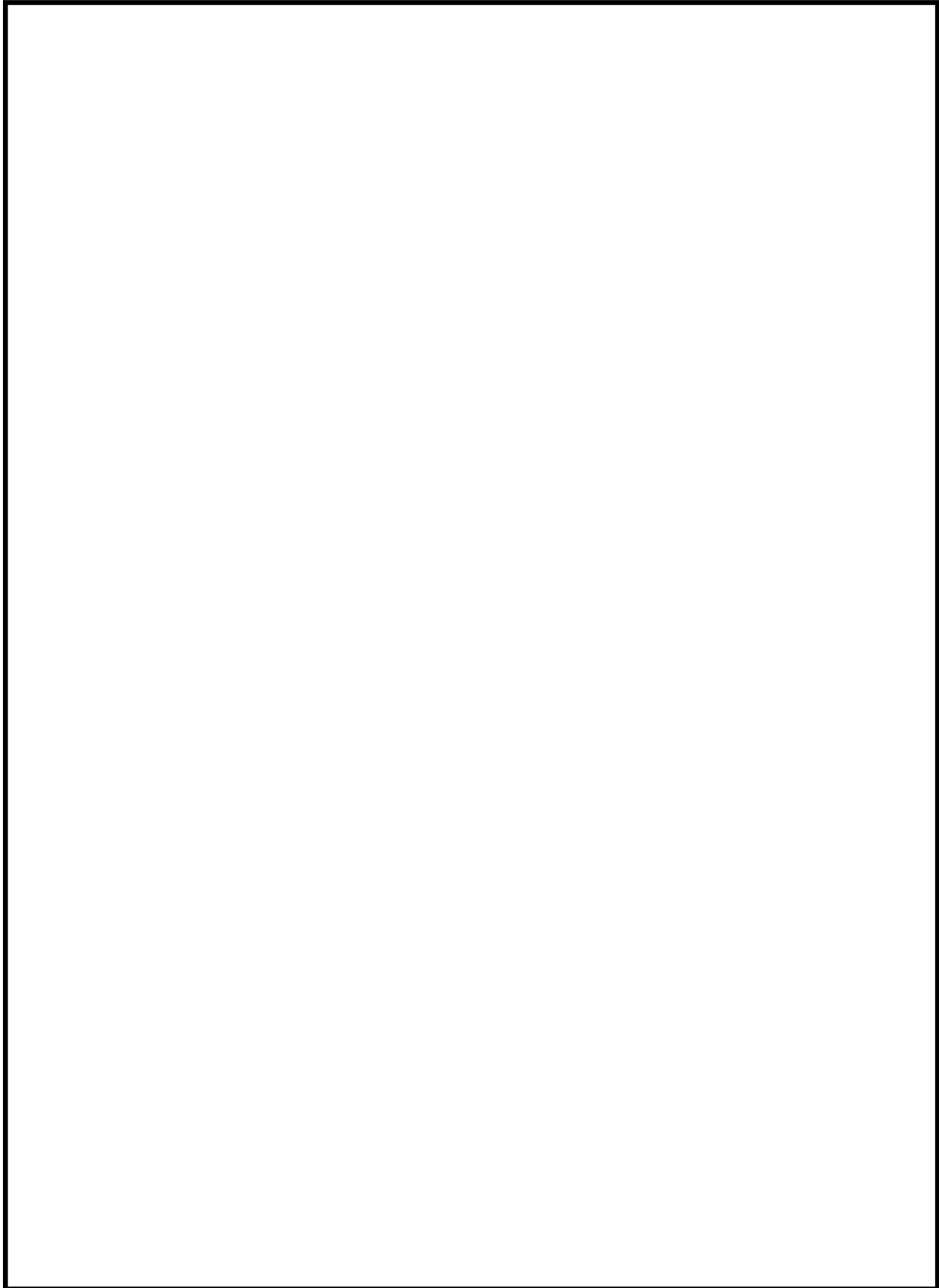
People often use stories to share information and teach each other, and they have throughout history. These stories are known as fables, folk tales, and many other names. Using what you have learned about stormwater and pollution so far, write a short fable to teach others about something they can do to help protect our environment!

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

Use the space on the following page to write your story. Your 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>. After you're finished writing it, share your story with someone to help them understand stormwater and the 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

Pet Waste

One major source of pollution with a large impact on the health of our waterways is **bacteria** coming from pet waste, also known as dog **feces** or dog poop. This is called **fecal bacteria**. Fecal bacteria is the bacteria that specifically comes from pet waste. If this waste is not picked up, rain will bring fecal bacteria into the storm drains where it will eventually end up in rivers and lakes. Most of the bacteria found in our water ends up there because people don't pick up after their pets. A storm drain is not a sewer; what goes into the storm drain flows directly into local bodies of water. This is another reason why we have to be careful about what goes down our storm drains.

According to *Live Science* in 2014, "America's 83 million pet dogs produce some 10.6 million tons of dog feces every year." The amount of dog feces produced in our country each year is enough to fill a line of tractor trailers from Seattle to Boston! If the litter and waste from the approximately 90 million cats was added to that amount, there would be enough pet waste to fill up more than 5000 10-foot deep football fields!

Why is dog waste such a harmful thing for our watershed? Many wild animals go to the bathroom outdoors and no one picks it up. While that is true, wild animals have a diet that is naturally found in our environment. Dogs are fed mostly processed food, which means their waste contains many different materials than the waste of the wild animals. Also, dog waste contains higher levels of **E. coli** than most other animals.

According to the Environmental Protection Agency, "a day's waste from one large dog can contain 7.8 million fecal coliform bacteria, enough to close 15 acres of shellfish beds." That's almost 15 football fields of mussels, oysters, and clams that humans use for food. So it is very clear how important it is for everyone to do their part to help with the problem of dog waste. So, what can be done with dog waste to prevent its spread throughout the watershed?

Tips about pet waste from the Environmental Protection Agency (EPA)

- *Always pick up after your pet* (It should be picked up with a plastic bag and placed in the trash).
- *Avoid walking your pet near streams and other waterways. Instead, walk them in grassy areas, parks or undeveloped areas.*
- *Inform other pet owners of why picking up pet waste is important and encourage them to do so.*
- *Take part in a storm drain marking program in your area to help make others aware of where pet waste and other runoff goes when not disposed of properly.*

Vocabulary

Bacteria: Small organisms, or living things, that can be found in all natural environments that are made of a single cell and can be seen only with a microscope

E. coli: A bacteria commonly found in the intestines of humans and other animals, where some strains can cause severe food poisoning

Fecal bacteria: Bacteria found in feces or fecal matter

Feces: Waste matter discharged from the bowels after food has been digested; poop

Main Activity

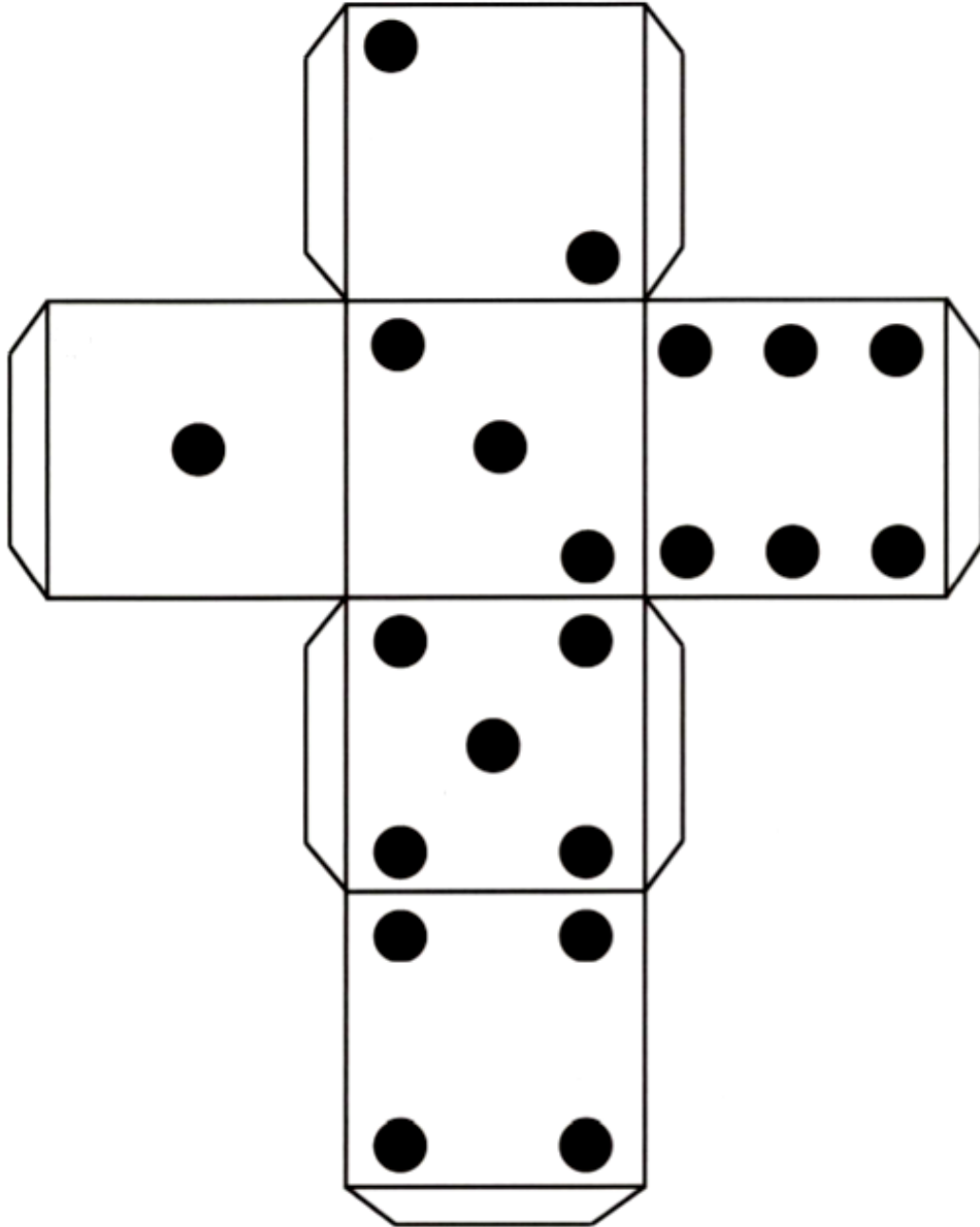
Scoop the Poop Game

Play this game to learn more about getting rid of animal waste the right way!

Materials: Provided game (game board, paper die or a real die, cards) and 2 objects (i.e. bottle caps) to act as people tokens









How to Play:

1. If using the provided paper die on the following page (feel free to substitute a real die if you have one), cut out the die on the outside black lines and then fold in small flaps. Fold on lines and tape into a square die.
2. Cut out cards on the next page and place them face down in a pile near your board.
3. Place both of your tokens at the “start” point on the game board.
4. Roll the die and move your token the corresponding amount of spaces.
5. If you land on a “dog poop” circle, you draw a card from the deck and follow the directions on the card.
 - *If you run out of cards during the game you may shuffle the used cards and place facing down to use again.*
6. The object of the game is to be the first person to have your token reach the “finish” circle.



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<p>You forgot your dog waste bag...</p> <p>Go back 3 spaces.</p> 	<p>You didn't pick up the dog waste from your yard...</p> <p>Go back 5 spaces.</p> 	<p>You put your dog's waste in the compost...</p> <p>Go back 2 spaces.</p> <p><small>(It needs to go in the trash!)</small></p> 	<p>You dumped your dog's waste down the storm drain...</p> <p>Go back 5 spaces.</p> <p><small>(A storm drain is not a sewer!)</small></p> 
<p>You picked up your dog's waste and put it in a plastic bag...</p> <p>Move ahead 4 spaces!</p> 	<p>You put the dog waste in the trash bin...</p> <p>Move ahead 3 spaces!</p> 	<p>You walked your dog away from the stream and other waterways...</p> <p>Move ahead 2 spaces!</p> 	<p>You told a friend why it's important to pick up their dog's waste...</p> <p>Move ahead 3 spaces!</p> 

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Optional Activity

Pet Waste Calculator

Use this activity to estimate how much waste your pet or someone else's you know makes every year!

Materials: Computer/tablet/phone, internet access, Scoop Pledge Sheet (provided), writing utensil

With an adult's permission, visit this website to calculate pet waste:

<https://www.petpooskiddoo.com/dog-waste-calculator/>

Use the dog waste calculator to calculate how much waste your pet/s (or a friend/neighbors' pet/s) produces each day/month/year. After finding out how much your pet produces in waste, sign the "scoop the poop pledge" on the following page and commit to helping our water!

If you can't visit the website, you can do some math to figure out how much poop a dog might make.

1. How much does the dog weigh? How much waste do they make per day?

- Dog Weight/ Daily amount of waste (poo):
 - ⇒ 15 pounds/ .28 pound of waste per day
 - ⇒ 30 pounds/ .56 pounds of waste per day
 - ⇒ 45 pounds/ .84 pounds of waste per day
 - ⇒ 60 pounds/ 1.13 pounds of waste per day

2. Multiply waste per day by 7 to find waste per week

- Example: A 15 pound dog creates 0.28 pounds of waste per day, meaning the dog creates $0.28 \times 7 = 1.97$ pounds of waste per week.

2. Multiply waste per week by 52 to find waste per year.

- Example: A 15 pound dog creates 0.28 pounds of waste per day, meaning the dog creates $0.28 \times 7 = 1.97$ pounds of waste per week, which means the dog creates $1.97 \times 52 = 102.66$ pounds of waste per year.



Scoop the Poop Pledge

Take the pledge to “scoop the poop” and do your part to help the Puget Sound!



I pledge to always clean up after my pet, even in my own yard.

I pledge to educate others about the importance of cleaning up after their pets.

I pledge to always carry extra doggy bags when I am with my pet.

Name: _____

Dog's Name: _____

Location: _____

Breed: _____

Age: _____

Favorite Spot: _____

My dog's photo:

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 a bunch of us work together, we can make big changes.

Materials: Writing utensil

For today's challenge, imagine what you could do if your friends and family in our region volunteered for a project that you designed! After what you've learned from this week's activities, what is a project you could design? What would you need to be able to carry out your project? 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!

- 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

DAY 5

Stewardship

Stewardship is how we think about and care for our environment. The choices that we make in our homes and neighborhoods are extremely important. The products that we use in and around our homes, and how we dispose of those products have an impact on the Puget Sound.

Even if we don't live right near the Sound, our actions matter because of how pollution flows into the storm drain that end up going directly into local bodies of water. So, it's important that we use **Best Management Practices**. These are things we all can use to limit the amount pollution that enters our environment.

Best Management Practices include:

- Pick up after your pet (scoop that poop!)
- Use the commercial car wash instead of washing cars on the street
- Use alternative transportation when possible, like taking buses or riding a bike
- Use compost instead of chemical fertilizers
- Dispose of dangerous chemicals properly
- Stay on the trail when exploring local waterways
- Share what you know about how to prevent and reduce pollution with others

What causes pollution?

Kind of Pollution	Where the pollution comes from
Too many nutrients from fertilizers	From gardens, yards or plants
Too many nutrients from soaps	From washing cars or any soap used outside
Oil or Gasoline	Dripping from cars onto roads and driveways
Bacteria	From animals. Not picking up dog waste; other animal waste near streams. Also can come from dead animals in streams/bodies of water
Pesticides, Chemicals or Metals	From gardens, yards, paints, cleaning products, or from trash
Trash or Litter	From people not putting trash where it should go and disposing of it properly

Vocabulary

Best Management Practices (BMPs): Methods that have been determined to be the most effective and practical means of preventing or reducing non-point source pollution to help achieve water quality goals

Stewardship: Caring for the environment; being a steward

Main Activity

Pollution Scavenger Hunt

Use what you've learned to see how many kinds of pollution you can find in a scavenger hunt in your home or neighborhood!

Materials: Writing utensil, paper

With an adult, go outside to conduct this scavenger hunt. If you cannot go outside, think back to some of the pollution you have seen in the past, or explore using only your eyes by looking from your window or balcony!

Helpful tips:

- Using the table from the lesson on the previous page, look for ideas of where pollution comes from near your home.
- Be creative. Look everywhere!
- When you have figured out the potential pollution source, fill it in on your sheet in the boxes provided.
- When you have filled in all of the boxes, you are officially a super pollution sleuth!

Excess Nutrients (Soaps)	Excess Nutrients (Fertilizer)
Oil/Gasoline	Bacteria
Pesticides/Chemicals	Trash/Litter

Optional Activity

Household Discussion

Discuss stormwater issues with an adult in your household. Think about what you know about how the actions of your friends and neighbors also contribute to our community stormwater issues.

There are different thoughts on the best way to grow our lawns and gardens, maintain our cars and vehicles, and take care of the pets and animals in our neighborhoods. You might find that different people do different things. Some people want to have a very green “perfect” lawn, other’s do not care as much. Some people need to drive a car everyday, and some people might choose to ride a bicycle. Some people have a pet, and are very careful about the waste they create, other people don’t think it is as important.

During the discussion, write down answers to the questions below!

Materials: Writing utensil

What are some of the things that you and your family do to care for our water?

What are some things you can do better?

What are some things your neighbors do that are helping our water quality?

What are some things you notice that they could do better?

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 about 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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- If you live in City of Lynnwood: Tag @LynnwoodWA and include the hashtag #Lynnwood
- If you live in King County: Tag @KingCountyDNRP and @kingcountywtd

ANSWER KEY:

Day 2 Main Activity: "Lawn Care Match-Up"

Source of Pollution	Water Quality Impact	Solution
Weed Killer	Too many nutrients means too much algae in freshwater	Avoid pesticides if possible especially near storm drains
Chemical Fertilizers	Poisonous to water bugs, fish, and animals	Pull weeds by hand if needed
Pesticide	Poisonous to native water plants	"Grasscycle" by leaving grass clippings after mowing