

## Activities to learn about watersheds, streams, and stormwater features

This activity sheet will show students how to find information about rainwater and the important role it plays in our community.

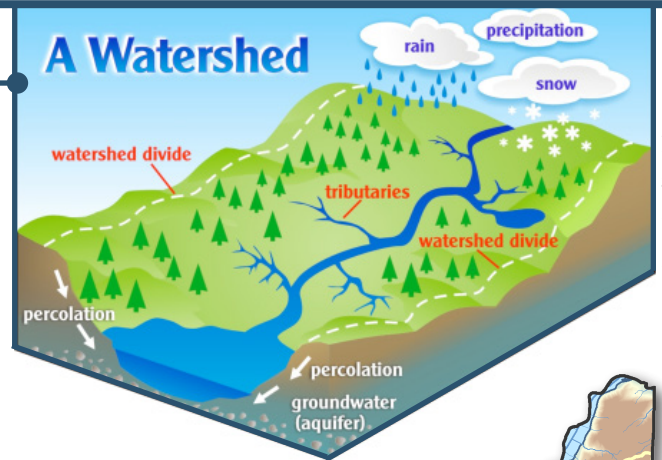
\* Water: RC-6

### We all live in a watershed....but what is it?

*Noun*

- 1 : a dividing ridge (as a mountain range) separating one drainage area from others
- 2 : the area that drains into a river or lake

In other words, when it rains, the water hits something and either seeps into the ground, evaporates back into the air or moves across the surface downhill. It eventually makes it way to the nearest water body (e.g. wetland, creek, stream, river or lake).



Source: City of San Carlos

### What watershed is your school in?

Great question! Clark County has ten major watersheds that eventually all drain to the mighty Columbia River. We all live in a watershed so find out which one you are in:

#### What to do

Visit the County's GIS mapping system **MapsOnline**. ([gis.clark.wa.gov/mapsonline/](http://gis.clark.wa.gov/mapsonline/))

- 1) On the Layers tab, turn on the Watershed layer.
- 2) On the Find Parcel tab, enter your address and click Find.
- 3) On the Layers tab, turn on the black "information icon" in front of the Watershed layer and then click on your parcel. The watershed name will appear in the upper left hand corner of the page.



Source: Clark County GIS

\* W (S)-2

#### Quick Fact:

How much rain falls in one year in Vancouver (in inches)?  
On average, Vancouver receives about 40 inches of rain. Check [US Climate Data](#) for more information.



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### \*Water and Grounds

#### Where does your rainwater go.....

Here is a chance to be a detective on your school grounds to answer this very important question:

**What happens to the rain water when it falls on your school?**

- **Where does the rain water go once it hits the roof?**  
(Hint: look for pipes that come down from the roof, etc.)
- **Where do the downspouts drain to?**  
(e.g. Into the ground, a discharge point to a pad, out to the street, a drain inlet on the ground)



Source: Google Maps

\*W (RC)-17  
G (S) - 12 **Is the rainwater collected for other uses?**  
(such as a rain barrel or cistern)

\*W (RC)-13  
G (S) - 13 **Does the water empty into a stormwater feature, such as a rain garden, bioretention swale, grassy area or detention pond?**  
(Hint: look for a shallow depression planted with native plants or a low spot that is soggy)

\*W (RC)-20  
W (S) - 16  
G (S) - 12 **Where do the impervious surfaces drain to (i.e. roads, parking and sidewalks)?**  
(Hint: After a rain fall where does the water flow)



Source: T&L



Field drain inlet



Downspout to rain garden



Splash pad



Storm drain inlet



Rain barrels

Source: City of Blue Island

#### What to do

Form teams of 4-5 students. With clipboard in hand and a map of the school, explore your school grounds. Identify where the rain falls, moves to and exits your school property.



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\* Grounds (RC) - 9

### Can the water soak into the ground?

How much water that falls on your school property can soak into the ground? If it can't soak in, where does the water go? Is the water captured for use in a garden?

**Pervious (adjective)** - Allows liquid to pass through. Examples include grass, dirt, play area mulch, landscape beds, etc.

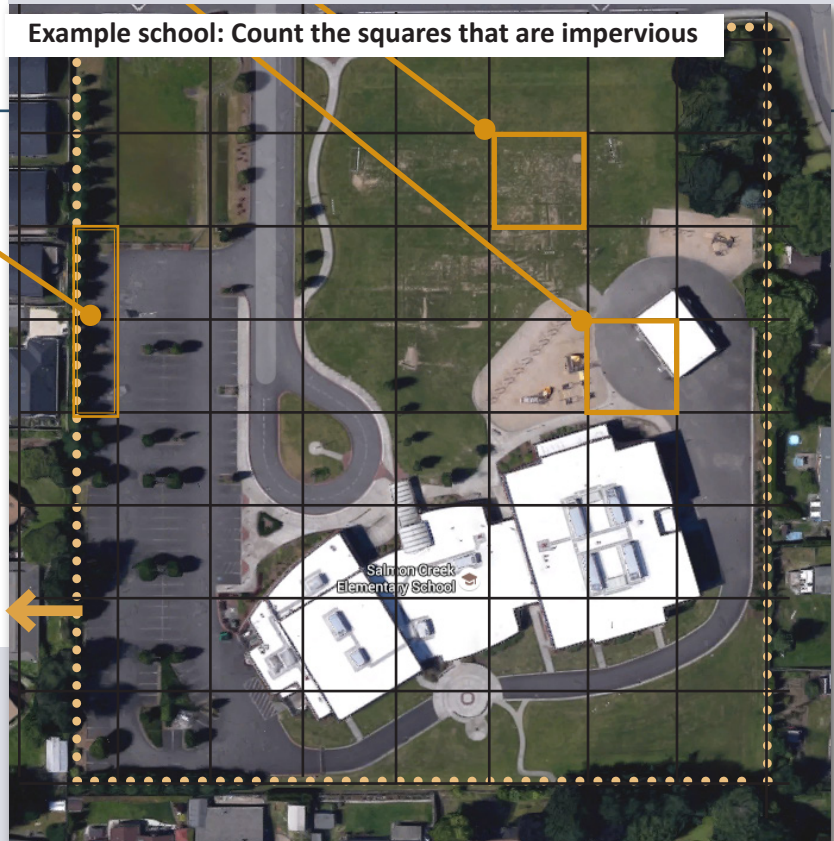
**Impervious (adjective)** - not allowing something (such as water or light) to enter or pass through. Examples include solid materials such as parking areas, sidewalks, roofs, and pavement, etc.

Some areas that get wet will evaporate the water back into the air so the water may not have a chance to run off or soak into the ground. This happens during small rain fall events.

#### What to do

Form teams of 3 students. Make an aerial map of your school with a grid overlaid on the map. Estimate the amount of impervious surface in each grid square. Total up the impervious versus pervious squares. Estimate the percent cover of impervious surfaces for the entire property. Follow the activity steps below.

#### Example school: Count the squares that are impervious



#### Estimation Activity for Percent Cover:

Find the total pervious and impervious squares:

##### 1. Impervious:

Estimate partial squares by combining to make one square. Total impervious squares: \_\_\_\_\_

##### 2. Grid size:

Total number of squares in the grid: \_\_\_\_\_

##### 3. Percent cover:

Amount of the entire property that is covered in impervious surfaces:

$$\frac{\quad}{\quad} \div \frac{\quad}{\quad} = \frac{\quad}{\quad} \%$$

Total impervious squares divided by Total squares = **Percent**

$$\frac{27}{56} \div = 48.2 \%$$

The percent of impervious surfaces is important. Stormwater enters the storm drains and goes to the nearest creek or stream. The water needs to be as clean as possible to minimize impact to the wildlife (such as fish). The water also needs to be slow enough to not damage habitat, like trees.



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\* Grounds (S) - 16 & 17; (RC) - 13  
 Water (S) - 16, 17 18 & 19; (RC) - 20, 21, 22 & 23

### Stormwater pollution - how did THAT get in the drain?

Storm drains lead directly to our local creeks, streams, rivers and lakes...untreated. Everything that goes in the drain ends up as pollution in our waterways. Look around your school grounds for sources of pollution.

#### What to do

Form teams of 3-4 students. With the activity sheet on a clipboard and a pencil, walk around your school grounds. Locate all storm drains (look on the grounds and along the street curb for inlets). Try to figure out what kind of pollution could get into the drains. Mark the boxes below if you see pollution. Pick one type of pollution and find a solution .....write down things you can do to keep it out of the storm drain.

How many drain inlets did you find in grassy areas (i.e. lawn areas and sports fields)? \_\_\_\_\_

How many drains did you find on the playground and sidewalk pavement areas? \_\_\_\_\_

How many drains did you find in landscape beds? \_\_\_\_\_

How many drains did you find along the street curb? \_\_\_\_\_

Want to know where those drains lead to? **Contact** the Clean Water Division and we'll get you a **free** map!

#### Types of pollution:



Soap bubbles (car wash)



Pet waste



Oily sheen (grease, oil, gas)



Chemicals



Trash & litter



Other (draw a picture)

**Pick one of these types of pollution** - What can your school do to reduce the chance of this pollution getting in the storm drain?

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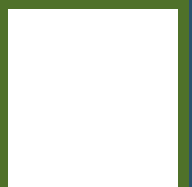
#### Storm drain marking

Did any of the storm drains have a stencil or medallion to educate about protecting the drain from pollution?  Yes  No



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\* Grounds (S) - 14-19, 21  
Water (S) - 17; (RC) - 21, 23

### How to keep your campus pretty? Ask the professionals....your school grounds manager

The professionals who care for the school grounds use all sorts of tools to keep the school safe, clean and well maintained. Interview the professionals to see how they work to reduce pollution to the storm drains.

G (S) - 14 **1.** Name of district grounds representative (e.g. school garden coordinator, grounds manager):

\_\_\_\_\_

**2.** Name of interviewee(s) (e.g. staff, Green Team, students):

\_\_\_\_\_

G (S) - 15 **3.** Does the school district have a policy to leave dead trees or fallen logs for wildlife habitat:

Yes  No

G (S) - 16  
G (RC) - 13  
W (S) - 19  
W (RC) - 21,23 **4.** Does the school district have a policy for Integrated Pest Management (how to manage problem bugs):

Yes  No

G (S) - 17  
G (RC) - 13  
W (S) - 19  
W (RC) - 21,23 **5.** Does the school district have a policy that limits or regulates the use of chemicals on campus?

Yes  No

G (S) - 18 **6.** When the grass is cut, are the clippings left on the ground for nutrients and reduce waste?

Yes  No

G (S) - 19 **7.** Are leaves left in place or used as mulch in landscape beds to reduce waste?

Yes  No

G (S) - 21 **8.** Does the school district have a policy that new plantings need to be native or drought tolerant?

Yes  No

#### What to do

This is your chance to learn about professionals who care for the school grounds. Invite your district's professional to be interviewed with key questions OR designate a key team member(s) to call or e-mail your list of questions. The goal is to learn how they mow, weed and maintain sites to minimize pollution to storm drains while keeping the site safe and clean.

**Pick one of these policies** - Ask more about that policy and how it can reduce pollution to the storm drain.....Which policy would you like to see changed on your school grounds? Explain why you would want to see a change. What could you do to make a change?

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**\* Grounds Water**

### Rain water as a resource.....keeping your school green.

Rainfall does a great job of keeping our trees, shrubs and grass growing during the school year. What happens during the dry summer season? Look around your campus to determine tools to keep water flowing.

#### REUSE (capture rain water and use again)

G (S) - 12  
W (RC) - 17

1. *Is the rainwater collected from downspouts into rain barrels or cisterns for other uses?*

Yes  No

G (S) - 13

2. *Do downspouts empty into a stormwater feature, such as a rain garden, bioretention swale, grassy area or detention pond?*

(Hint: look for a shallow depression planted with native plants or a low spot that is soggy)

Yes  No

#### CONSERVATION (save as much as possible during use)

G (RC) - 6  
G (S)10,11  
W (S)10-14

3. *Irrigation - mechanical system to water the grass.* In the space below, explain how your schools' irrigation system works to conserve water and only use what is needed to keep plants green!

*Does your school have an irrigation system?*  Yes  No

*Does your school use the irrigation system* (or does the landscape have to thrive without water over the summer)?

Yes  No

*Does your school use drip-irrigation system to save water?*  Yes  No

*Are sprinklers on timers to save water* (evenings saves more water from evaporation)?  Yes  No

*Does your school have a garden* (how do you keep it watered over summer)?  Yes  No

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#### What to do

On school grounds, water is vital to keep trees, shrubs grass and plants alive. Clean water is a limited resource and limiting the need for water use can go a long way to saving water. Reducing overwatering protects what goes into storm drains. How does your school water the grounds? Ask a district representative or be your own detective and look for clues on the school grounds.



Drip irrigation

Source: AgriTech



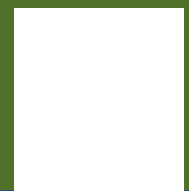
Rain barrels

Source: City of Blue Island



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\* Grounds (S) 2; (RC) 10  
Water (S) 7, 8

### The plants that you see.....trees, shrubs and gardens help protect stormwater.

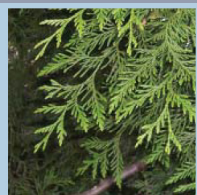
The Pacific Northwest has a large variety of beautiful and interesting plants that are native to our region. Native plants help control erosion (soil washing away), increase stormwater infiltration (ability of water to soak into the ground), require less water and no chemicals to maintain their health. Not only that, they are beautiful and help our local wildlife to thrive.

#### What to do

Native plants are adapted to our local climate and are naturally resistant to pests and diseases. Most school grounds have native plants. Look around your school grounds and identify the trees, shrubs and plants. Count how many you see. On a separate piece of paper, draw the shape of your favorite leaf.

#### Native Plant Guide:

Clark County has free native plant guides to help your class identify native plants by their leaves and flowers. Visit our [webpage](#) for a copy or contact our office. Here are a few examples:



Western Redcedar



Vine Maple



Kinnikinnick

Tree  Shrub  Ground cover  Flower  Sun  Part shade  Shade  
 Evergreen  Deciduous  Grows fast  Moderate  Grows slow  
 Wet soil  Moist soil  Dry soil  Can spread-multiply

#### QUICK TREE FACTS -

- In one day, one large tree can lift up to 100 gallons of water out of the ground and discharge it into the air.
- In light rain events, some large trees can intercept (catch and hold) up to 100 gallons of water that is then evaporated back into the air. (Source: americantree.org)

#### TREES:

##### Evergreen

Keeps leaves (needles) all year



Yes

No

How many? \_\_\_\_\_

##### Deciduous

Loses leaves every fall



Yes

No

How many? \_\_\_\_\_

#### SHRUBS:

Plants that typically do not grow more than 15 feet tall

Yes  No How many? \_\_\_\_\_

#### GROUNDCOVER:

Plants that typically do not grow more than 3 feet tall and have no trunk or large branches.

Yes  No How many? \_\_\_\_\_

#### Does your school use plant areas as part of learning?

Explain:

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\* Grounds (S) 3, 6,20  
Water (S) 9

### Natural yard care can play a role in protecting storm water

Some times it is the little things that can add up to make a big difference. On school grounds, there are several small features that can help protect the grounds, the plants and the rain water. Take a look at the landscaping around the grounds and see how GREEN your school is and brainstorm ideas to improve the grounds.

#### What to do

Take a look around your school grounds, especially the landscape beds and see what you can find. Look for the three items listed in the activity listed below. Discuss with your team ways to address these items.

#### 5 Common Practices for GREEN yard care:

1. Build Healthy Soil with Compost and Mulch
2. Choose the Right Plants for the Site
3. Practice Smart Watering
4. Use Natural Pest, Weed and Disease Control Methods
5. Practice Natural Lawn Care (leave grass clippings)

#### Compost

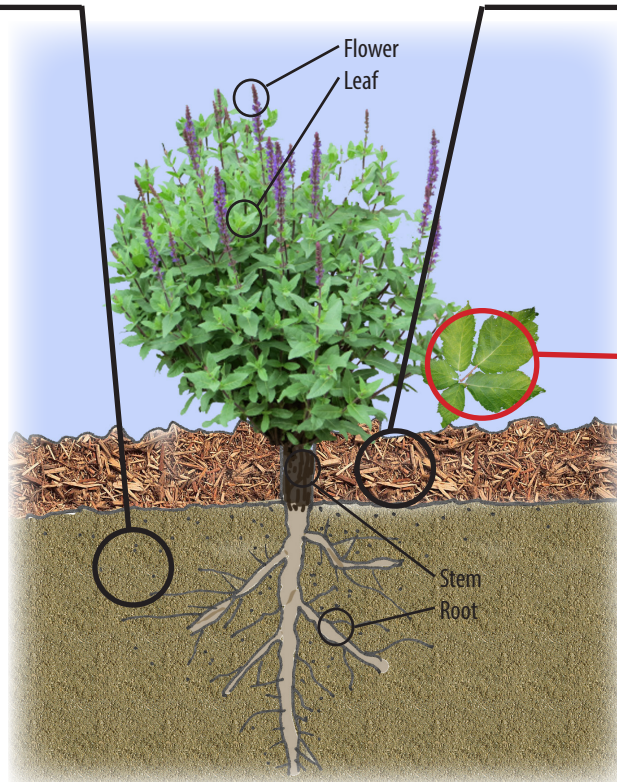
Compost is made up of decayed organic materials such as food scraps, leaves, small branches, etc. Compost is used to add nutrients to the soil to help plants grow. Small organisms, such as worms and bacteria help to break down the compost for the plant to use. Learn more about composting [here](#).

Does your school have a worm bin or compost feature to reuse compost on-site?

Yes  No

Does your school participate in saving food scraps in the cafeteria that is then sent to a composting facility?

Yes  No



#### Mulch

Material (such as decaying leaves, shredded tree bark, or chipped wood fibers) spread around a plant to enrich and keep moisture in the soil. This helps provide the water and nutrients the plant need. Do your plantings and trees have mulch?

Yes  No

#### Weeds

The definition of a weed is a plant growing where it is not wanted. Weeds are common in our region. Plants like Himalayan Blackberry grow quickly and can over take landscape beds.

How does the district manage weeds at your school? Does your school support volunteers pulling weeds?

Yes  No



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\* Grounds (S) 4,5,7,19  
Grounds (RC) 12

### All animals need clean water, as well as food, shelter and place to raise young....

Does your school grounds provide all the habitat necessary to have wildlife call it home? A diverse set of wildlife can be an indicator of a healthy area, including the water. Walk around your school grounds and find where animals may live or visit. The key is to look for their habitat. Remember, different kinds of animals use different kinds of habitat.

#### Habitat type:

First, write down what type of habitat you think each of these animals prefers:

#### BIRDS (scrub jays, sparrows, crows, seagulls, hawks, owls, etc.)

- Food \_\_\_\_\_
- Water \_\_\_\_\_
- Shelter \_\_\_\_\_
- Place to raise young \_\_\_\_\_

#### MAMMALS (squirrels, raccoons, bats, mice, etc.)

- Food \_\_\_\_\_
- Water \_\_\_\_\_
- Shelter \_\_\_\_\_
- Place to raise young \_\_\_\_\_

#### AMPHIBIANS & REPTILES (snakes, frogs, toads, salamanders)

- Food \_\_\_\_\_
- Water \_\_\_\_\_
- Shelter \_\_\_\_\_
- Place to raise young \_\_\_\_\_

#### What to do

Form teams of 4 students and walk around your campus looking for the habitat for the various types of animals that could live at your school's grounds. Are there areas where there could be more habitat?

#### How you can help

1. Does your school keep a log of wildlife seen around your grounds? Keep a clipboard and pencil in a key location to write down what animals you see.  
 Yes  No
2. Does your school have at least two types of habitat features, such as bird feeders, bird houses, water features or a habitat garden?  
 Yes  No
3. Does your school plant new types of plants to enhance wildlife habitat and attract new species?  
 Yes  No
4. Does your school leave logs on the ground?  
 Yes  No



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