Storm Drains for Wise Brains

Lesson Overview:
This lesson may be part of an Oceans or Water Unit. Storm drains are ubiquitous in all Yukon cites and towns – so much so that we barely notice them. Yet much of what gets inadvertently or deliberately washed down these drains is toxic to the ocean environment. In coastal cities and towns, pollutants enter directly into the ocean via storm drains or indirectly into the ocean via streams, rivers and lakes. In this lesson, students will learn about the impact of storm drain water on the ocean environment.

Grade Level:
4 - 5

Time Required:
One 60-minute class

Curriculum Connection:
Yukon – British Columbia Integrated Resource Package:
- Grade 4 Science (Water; Predicting); Social Studies (Society and Culture)
- Grade 5 Science (Designing experiments); Social Studies (Environment)

Link to Canadian National Geographic Standards:
**Essential Element #2:** Places and Regions
- Physical and human characteristics of places and regions within the province and Canada

**Oceans Scope & Sequence Standard #2:** Places and Regions
- Characteristics of ocean habitats (shorelines)

**Essential Element #5:** Environment and Society
- Environmental Issues

**Oceans Scope & Sequence Standard #5:** Environment and Society
- Human influences on oceans

**Geographic Skill #1:** Asking Geographic Questions
- Ask geographic questions – Where is it located? What is significant about its location? How is its location related to the locations of other people, places and environments?

**Geographic Skill #2:** Acquiring Geographic Information
- Locate, gather and process information from a variety of primary and secondary sources including maps.

**Additional Resources, Materials, and Equipment Required:**
- Inspirational quote (sample quote provided)
- Copies of Sample Focus Questions handout
- Clipboards
- Copies Storm Drains for Wise Brains Web Quest activity sheet
- Internet access

**Main Objective:**
Students will be able to explain how motor oil, solvents and other human made toxins that are left on the street or poured into storm drains will end up in the ocean. Students will be able to devise strategies to reduce the negative impacts of storm drain pollution.

**Learning Outcomes:**
By the end of the lesson, students will be able to:

- List several deleterious substances that are typically washed down local storm drains
- Explain how substances that are washed down storm drains will end up in the ocean
- Articulate at least two ways in which they, their families, and the general public can reduce storm drain pollution
The Lesson:

<table>
<thead>
<tr>
<th>Teacher Activity</th>
<th>Student Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Begin the lesson by sharing an inspirational quote that is printed on the board or on a poster so that it can be referred to throughout the unit on Water. (Many such quotes are available. An example is attached.)</td>
<td>Examine focus questions and try to guess possible answers to some of the questions. Leave the class prepared for fieldwork (with pencils and clip boards).</td>
</tr>
<tr>
<td>Inform students that they will be going outdoors for part of this lesson. Distribute clipboards and “Focus Questions” handout.</td>
<td>Contribute ideas about what the oil stains are, where they originate, where they go and what the ultimate effect might be.</td>
</tr>
<tr>
<td>Choose a safe and accessible storm drain along the street near the school. Lead students to the storm drain. On the way along the sidewalk, point out motor oil on the street and ask the class what they think this is, where it comes from and where it ends up.</td>
<td>Return to class.</td>
</tr>
<tr>
<td>Return with students to class.</td>
<td>25 minutes</td>
</tr>
<tr>
<td>25 minutes</td>
<td>25 minutes</td>
</tr>
<tr>
<td>Explain the Web Quest activity to students. If possible, make it available to students electronically so that they can click on hot links rather than having to type out each address. Explain that this is an individual assignment and that assessment is based on accurate responses to Web Quest.</td>
<td>Work individually to complete the Web Quest.</td>
</tr>
<tr>
<td>Circulate to facilitate and clarify where needed as students work through the Web Quest.</td>
<td></td>
</tr>
<tr>
<td>Hand-in completed Web Quests or share answers with the class.</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Collect the Web Quest activity from students or take up the answers as part of a whole class discussion.</td>
<td>10 minutes</td>
</tr>
</tbody>
</table>
Lesson Extension:

1) Students work (solo, in groups or in pairs) to create posters that inform the school community on best practices for reducing storm drain pollution. Copies are made and distributed to families as well as community centres, City Hall, community pool, etc.

2) Students and teacher take part in a community storm drain stenciling project. There is often a local environmental group organizing this. If not, obtain permission from the city works department and use permanent paint (the kind used to paint street lines) and a class-made stencil in the shape of a fish. Organize small groups (accompanied by at least one adult for traffic safety purposes) to stencil the fish next to the storm drains.

Suggested Assessment:
- Observe student participation in pre-mini-field trip discussion.
- Students may submit notes in response to Focus Questions.
- Web Quest questions could be collected and assessed for accurate responses.

Further Reading:


Inspirational Quote (From John Heider’s *The Tao of Leadership*)

*The wise teacher is like water. Consider water:*

*Water cleanses and refreshes all creatures*

*Without distinction and without judgment;*

*Water freely and fearlessly goes deep beneath*

*The surface of things; water is fluid and*

*Responsive; water follows the laws freely.*

Consider the teacher: the teacher works in any
Setting without complaint, with any person or
Issue that comes to the floor. The teacher acts
So that all will benefit, and serves well
Regardless of the rate of pay. The teacher
Speaks simply and honestly and intervenes
In order to shed light and create harmony.

From watching the movements of water, the
Teacher has learned that in action, timing is
Everything. Like water, the teacher is yielding.
Because the teacher does not push, the
Group does not resent or resist.
Sample Focus Questions
for Storm Drains for Wise Brains Street Field Trip

What do you see on the street that might be hazardous to the ocean environment?

Where might those hazardous materials end up? Where does the storm drain go?

How does the water travel to its destination?

What other substances might be washed down the storm drain?

What might be affected by substances washed down the storm drain?

Who builds and maintains these drains?

What ways can you think of to reduce storm drain pollution?
Storm Drains for Wise Brains Web Quest

Use point-form research notes to complete the following challenges.

Go to http://protectingwater.com/storm-drains.html to answer the following questions.

1. Define “storm drain”.

2. Why not wash pollutants down the storm drain on your street?

Click on automobile

3. What sort of pollutants come from automobiles that might end up washing down into storm drains?

4. List some of the effects of these pollutants.

5. List at least three good ways to reduce storm drain pollution.
   A) 
   B) 
   C) 

6. Define “toxic”. (You will need your dictionary)

Go to www.city.victoria.bc.ca/cityhall/departments_engwaterrock_bckgrn.shtml
Read the third paragraph. Define the following:

7. Point-Source Pollution:

8. Non Point-Source Pollution

Go to http://volws.bc.ca/education/NPS.html

Read the first three bullets, then click on Homeowner Tips: What can you do to help?

Click on Washing Your Car

9. Describe two ways to wash your car that is safe for the environment:

A)

B)

Click on Vehicle Maintenance

10. Describe two ways to keep your car safe for the environment:

A)

B)

11. What can you do with your used motor oil?