changing currents Action Plan
Localized Stream Action

eco spark
discover · act · change

diverting and collecting rain water (at school)

overview:

When it rains at school, where does the water go, and what effect does it have on our watershed? Could this water be diverted from entering storm drains and harming the ecosystem, collected, and even used productively?

In this activity, you will lead your students through the development of a rain water catchment and storage system to:
a) divert water from storm drains, and
b) use it for watering school grounds or neighbouring areas.

What's the point?

1. Storm water systems disrupt a natural filtering process – where rainwater soaks through the soil and into ground water to get to the stream. Storm water arriving to streams from storm drains carries pollutants from roads and lawns, and it arrives much faster – both having an impact on the stream and the life it supports.

2. Most parts of Toronto have 2 different sewer systems: storm water sewers, and sanitary sewers. However, in the older parts of the city, these two systems are combined. This isn't a problem until there's a heavy rainfall, and the system overflows – causing the waste water to bypass the treatment plant and flow straight into our streams and Lake Ontario! If we can help to divert rainwater from entering storm drains, we are lessening the likelihood that this kind of overflow will occur.

3. Catching and storing rainwater, which can then be used to water lawns, fields and gardens at other times, allows us to better conserve water.

time it takes:

- 1.5 to 3 hrs for in-class preparation
- 1.5 to 3 hrs for building and installation.

planning:

- ☐ Make sure you plan a meeting with your principal and custodial staff to discuss the possibilities for rain water collection at your school before you begin preparations for this activity. Your class will need both their direction and support.
- ☐ You may also need to consider your budget, or fundraising opportunities (if you plan to purchase rain barrels or materials to construct them).

extension: painting!
Paint and decorate your rain barrels. This one's a watershed!

The City of Lenexa (Kansas)'s rain barrel parade.

teaching and learning strategies:

In-Class Preparation

1. Review the results from your Changing Currents workshop. What conclusions did you make from the data you found?

2. Ask students how rain water catchment and stream health are connected. Have them discuss the following questions:
   What is storm water?
   How does it affect stream health?
   Will rain barrels help? How?

3. Introduce the activity and its parameters: as a class, you will design and install a rain water collecting device.

4. Students should go out to research the school grounds. They can map the building and the surrounding area, indicating which areas are impervious and which areas allow rain water to soak into the ground. Consider planning your school observation for a rainy day, so students can observe the rain fall and water collection in different places around the school grounds. Along with mapping, they could consider the school grounds observation questions.

5. Ask students to design and plan a rainwater collection system. This could be done as a whole class, or done in smaller groups. Ideas can be discussed and developed, and the class can decide together what designs they would like to install.

6. Have students present their proposals for the catchment device, as well as an idea for what can be done with the water that is collected and a plan for maintaining the rain barrel. Students may want to invite the principal or custodial staff into the classroom for this segment, to approve and support the plans that are made.

7. Decide how you will collect and purchase materials and appropriate tools as class.

Building and Installation

The degree of student involvement in this phase will depend on their age as well as the plans you've made.

1. Ensure there is adequate supervision and space for the activity – you may want to contact parent volunteers, other teachers and custodial staff.

2. Have the students or adults build and/or install the selected device. Provide guidance and suggestions when needed.

school grounds observation questions:

- Where does water collect (puddles/ ponds) during and after rain storms?
- In what areas does rain flow into storm drains?
- Where are the storm drains located?
- Identify where the downspouts and gutters are, and where they lead to.
- Are there any areas on the school grounds that look like they need more watering?
- Should more gutters and downspouts be installed to direct rainwater flow? If so, where?
- In your opinion, where should a rain barrel be installed? Why?

extension: rain garden

Have your class build and design a **rain garden.** See **resources** for an article on rain gardens!

materials and equipment:

- Rain barrel (one, or materials to build your own, can be purchased at hardware stores)
- Gutters and/or PVC pipes for rain 'directing'
- Garden hoses
- Cinder blocks (to support/raise rain barrel)
- First Aid kit for building day

After Building and Installation

1. Have students publicize their project as a success story for their class, outline its purpose and why they've installed it on school grounds, so that all students are aware of the project and why it's significant.

2. Ask student volunteers to be involved in the rain barrel's maintenance and in watering appropriate areas of the school grounds with their collected rain water.

extension: disconnect your downspouts

What kind of water diversion system does your school have? Some are accessible outdoors, while others run through indoor structures directly into the storm water system. Could your class advocate for the diversion of all rainwater at school from the storm drains?

extension: school water audit

Check out the TRCA's educational resources on water conservation and virtual water.

extension: testing rainwater

Science teachers may want to take the opportunity to chemically test the collected water with their students.

resources:

Materials and detailed instructions for building your own rain water collection system are available on **W.A.T.E.R.**'s website (watershed activities to encourage restoration) (http://www.watershedactivities.com/projects/spring/rainbarl.html)

LID (Low-Impact Development) Sustainable Schools Project (http://www.lowimpactdevelopment.org/school/index.html)

Toronto and Region Conservation (TRCA) has produced water educational materials, including activities like a 'School Water Audit' and learning about 'virtual water' (http://www.trca.on.ca/school-programs/teacher-resources.dot)

Wikipedia article on **Rain Gardens** (http://en.wikipedia.org/wiki/Rain_garden)

Project Flow (for the love of water): resources for rethinking education for a sustainable future (http://r4r.ca/en/project-flow)