

Preparing for Flood Resilience

#FLOODED

Grades 3 - 12

Activity



Main Objective

Learners will learn what municipalities and authorities are doing to make their cities more resilient to flooding, while understanding the importance of flood risk management for their schools.

***Note:** You will need to complete the Flooding Mapping Activity first to complete this activity (which can be found under "Activity Step 3").*

Learning Outcomes

By the end of this activity learners will:

- Learn what municipalities and authorities are doing to make their cities more resilient to flooding
- Learn the importance of flood risk management planning for their schools
- Understand the volume of water that falls during a rain event in their school area
- Understand the meaning of permeable, what that means to flood resilience and how to calculate the area of your school that is permeable

Length of Activity: 4 - 5 hours

Step 1+2: Case studies on municipal flood resilience plan and group discussion (60 - 90 minutes)

Step 3: Create a flood map for your school (90 - 120 minutes)

Step 4: Calculate the amount of rain that would fall on school grounds (45 - 60 minutes)

Step 5: Calculate the surface permeability around your school (30 - 45 minutes)

Materials Required

- Internet-enabled device
- Assessment Rubric
- Flood:ED Backgrounder
- How Much Rain Falls? Learner Worksheet
- How Much Surface in Your School is Permeable? Learner Worksheet

Activity

Step 1: Case Studies of Flood Resilience Plans (30 - 45 minutes)

Divide the class into groups and assign one of the following case studies to each group for review:

- City of Calgary Flood Resilience Plan:

 <https://www.calgary.ca/UEP/Water/Pages/Flood-Info/Mitigation-and-Resilience/Flood-projects.aspx>

- Kawartha Lakes Ontario Flood Emergency Planning:

 <https://www.kawarthalakes.ca/en/living-here/emergency-management.aspx?mid=23169>

- Toronto and Region Conservation Authority Flood Risk Management:

 <https://trca.ca/conservation/flood-risk-management/>

Step 2: Class Discussion on the Case Studies (30 - 45 minutes)

After reading the articles, discuss in groups:

1. Identify and share with the class the steps identified in the flood risk management plan of the case study you reviewed.
2. After all groups have presented the steps identified, together as a class map the common steps included in the three examples presented.
3. Does your school have a flood risk management plan? If not, do you think your school should have a flood risk management plan – why or why not?
4. Do you have enough information to answer the question above? If not, what may help in answering the question above? Who could you contact for more information?

Step 3: Take a Flooding Mapping Tour in Your School or Neighbourhood (90 - 120 minutes)

Go to the Flooding Mapping Tour activity linked below to identify, count, and take pictures of the human-made and natural things in the stormwater infrastructure around your school or neighbourhood.

 <https://programs.greenlearning.ca/course/flooding-mapping-tour>

After completing the activity and preparing your Flooding Map, you will get a good understanding of where flooding or pooling occurs in your school or property and other problems areas.

Now that you know your school and/or property well, together with the problem areas, it is time to get to work!

Step 4: How Much Rain Falls? (45 - 60 minutes)

Show learners how to calculate the volume of rain falling in your school area using GreenLearning's Flood Assessment tool *"How Much Rain Falls?" Learner Worksheet*.

Consider the following as you calculate the volume of rain falling in your area:

- Search for a recent local story of a severe rainstorm. How much rain fell? How would this change your calculations?
- You can use this resource to find out precipitation data in your location:

 <https://www.weatherstats.ca/>

- Click on the above link, select your location from the dropdown menu, and scroll down the page to see the precipitation chart and information.

Discuss the following in your group after you complete the activity:

1. Were you surprised by the amount of rain that falls on your school during a typical rain event?
2. Is there a time of year that your community or school is more vulnerable to a flood?
3. How much is 1 cubic meter of water? Here is an image to help you visualize it!



Source: <http://townofirricana.ca/utility-bill-concerns-addressed/>

Step 5: What Surface of Your School is Permeable? (30 - 45 minutes)

Begin by explaining the following definition:

- **Run-off:** When it rains, the water must go somewhere; if it doesn't soak in the ground, it is called runoff. This is the most common cause of flooding, especially urban flooding.
- **Permeable Surfaces:** Surfaces through which water can infiltrate or percolate (makes its way down into the earth). Examples would include fields, forests, gardens, lawns, and parks.
- **Impermeable Surfaces:** Surfaces through which water cannot infiltrate. Examples include roads, paved areas like some schoolyards, parking lots and industrial locations. While most asphalt or concrete are impermeable, there are some new types of porous asphalt and concrete that are permeable.

Continue to understand how much surface in your school is permeable.

- Calculate the percentage of permeable surface using GreenLearning's *"How Much Surface is Your School Permeable?"* Learner Worksheet

Once you complete the calculation, consider the following questions for group discussion:

1. Where does the water go when it runs off your school grounds during a rain event?
2. Search online for sewer or drainage ditch maps of your community; sometimes they are very detailed and even have photos.
3. What is the advantage of having a high percentage of your school grounds as a permeable area?
4. What can be done to improve your school grounds to reduce flooding?
5. Which area(s) could be changed from impermeable to permeable? How?