

Install Rain Barrels

#FLOODED

Grades 3 - 12

Activity



Main Objectives

Learners will learn how to install rain barrels around their school or house and how rain barrels can potentially reduce flood risks by diverting the water into the barrels.

Learning Outcomes

By the end of this activity learners will:

- Learn how to install rain barrels around their school or house
- Learn how rain barrels act as a means of diverting rainwater that may lead into possible flooding

Length of Activity: 1.5 - 2 hours

Step 1: Intro to rain barrel installation.

Step 2+3: Find a location to place the rain barrel and calculate the roof surface.

Step 4+5: Plan, sketch, and gather materials for the rain barrels.

Step 6+7+8: Start assembling the rain barrels and perform any required maintenance.

Materials Required

- Rain barrels
- Downspout diversion kit
- 1 - 2 paving stones 24 x 24 inches
- 2 - 4 cinder blocks
- 1 - 3 bags of fine gravel
- Screen to cover the rain barrel

Tools Required

- Rakes
- Shovels
- Gloves
- Screw gun
- Metal cutters
- Level 2 ft or 4 ft (to ensure the base is level when placing the paving stones and cinder blocks)
- Old hose piece to connect two rain barrels, in case you are using more than 1 rain barrel
- Hose connector kit from home hardware stores to connect two or more barrels

Activity

Step 1: Watch a Video Tutorial

Begin by watching this video tutorial on how to install rain barrels on your property:



Step 2: Locate Downspouts

- Before you begin, identify any external downspouts on your property.
- If you're installing a rain barrel in your school, note that some schools have internal downspouts that run from drains on the roof, inside the building and down to the storm sewer.
- Other schools also have external downspouts that run from the rain gutter down the outside of the building and into the storm sewer. Find out if your school has external downspouts.

Step 3: Calculate the Roof Surface

- To find out how much rainwater you can collect, and the size of the rain barrel you need, you will have to find out the surface area of your roof.
- Use our GreenLearning's Rainwater Calculator to find out your roof surface area:

 [GreenLearning's Rainwater Calculator](#)

- Remember to take into consideration the total number of downspouts there are on your property, and how much of that water is flowing to the one that you are disconnecting.

Example:

Roof size: 4 m x 10 m = 40 m²

40 m² x 20 mms of rain = 800 litres of water

Use the worksheet, ***"How Many Rain Barrels Are Required?"*** to help solve the number of rain barrels are required at your school during a typical rain fall event

Step 4: Sketch Your Planned Project

Before starting to build your project, grab a piece of paper and write down your action plan.

- Draw a sketch of the entire project – the number of barrels you will install by the downspout.
- Include the base in your sketch on which the barrels will sit and indicate the measurement of the base.
- Identify all part of the barrels and the downspout connectors.
- Write down all the materials and the tools you will need.
- Once you have a sketch ready, together with the notes, present the idea to the appropriate person required to give approvals of the project. Ensure that the proper health and safety measures are put in place before implementing the plan. Put a budget together and identify where funds will come from.

Step 5: Get Your Materials and Tools

Materials:

- **Rain barrels:** You can purchase them at various home hardware stores. Alternatively, you can make your own by recycling old plastic cans, i.e., check out this resource for inspiration:

 <https://www.manmadediy.com/4842-how-to-make-an-inexpensive-diy-rain-barrel>

- **Downspout diversion:** there are various ways of diverting the rain water from downspout – you can search for rain barrel diverter kits that includes all parts required for diverting water from a downspout into a rain barrel, such as this one:

 <https://www.amazon.ca/Earth-Minded-Barrel-Diverter-Parts/dp/B005CJFBJE?th=1>

- **Leveling ground and raising the rain barrel:**
 - 1 - 2 paving stones 24 x 24 inches for a level and sturdy base
 - 2 - 4 cinder blocks to raise the rain barrel above ground level to allow for gravity drainage
 - 1 - 3 bags of fine gravel as a base to level ground for paving stones
- **Screen to cover the rain barrel:** Once the job is complete, cover the opening of the rain barrel, you can use any waterproof material like a plastic sheet or a tarp.
- **Tools listed on page 1.**

Step 6: Set-up Rain Barrels by the Downspout

With your sketch in hand, grab your materials and tools and get to work!

1. Locate where the rain barrels' base or "footprint" will be. Ensure that the footprint is aligned to the downspout you are connecting to.
2. Level the area by clearing the vegetation, turf, roots, and stones. Add a layer (1 - 5 cm) of crushed gravel to ensure the footing area is compacted. Then use a level to ensure that base is not on an angle. This will give you a durable and stable base on which to put the rain barrel. This is an important step because a rain barrel filled with water is very heavy and needs to be level and stable.
3. Now you have a level area with a fine crushed gravel base to place the paving stones and the cinderblocks on. You want to raise the height 30 cm to allow for gravity to drain the rain barrel. You can "sandwich" the cinder blocks between two paving stones to create a stable and elevated platform. If you are considering smaller elevations of 12 to 24 cm use two to four paving stones placed on top of each other.
4. Arrange the empty rain barrels in place and assembled as per the instructions. You now know at what height that you need to drill a hole in the downspout at.
5. Follow the instructions in the downspout diversion kit and use the tools in the kit to drill a hole in the downspout and connect the pipe in the kit to the rain barrel.

Step 7: Identify the Location of the Overflow

If a rain barrel has not been emptied before a rainfall, or if the rainfall exceeds the storage capacity of the rain barrel, there will be overflow. The rain barrel overflow needs to be directed to a safe location at least 3 meters from the building foundations, where it can safely drain. Overflows can be directed to a rain garden or a French drain by pipe and/or swale.

Some key factors to consider for the overflow:

1. What is the soil drainage capacity? To find out, dig down and take a soil sample. Is it clay or sandy soil? The sandier the soil is, the better, and the faster the drainage will be, or the smaller the drainage area will need to be.
2. How deep and how wide and long will the drainage area need to be?
3. What type of gravel or stone will you use to fill the hole?
4. What will the exposed surface be covered with: river stone, gravel, sand and or turf?

Note: In some cases, rain barrel overflow can be directed safely away from the building, without building a drainage area, if the soil drainage is good and the slope runs away from the building foundation.

Step 8: Rain Barrel Maintenance

Inspect periodically for leaks, especially spigots and other connection points. Make sure debris does not clog the system. Screen all vents to prevent mosquito breeding. For maximum stormwater benefits, empty the barrel between rain events in the wet season. Before the first sub zero winter day empty rain barrel and store safely.

Need Extra Support?

There are several ways that you can gather additional support or find free options to do this project. Here are a few recommendations:

- If you're doing the project in your school, you can approach your maintenance or facilities staff for tools and resources they already have. Not only will they have lots of great advice they may have the materials and tools that you will need.
- If you're doing the project at home, you can approach your parents and community for donations of plants, soil, compost, or materials.
- Contact local business for donations of materials that you will need.
- Contact other local organizations or groups like conservation authorities, environmental groups, and your municipality for support.
- Hold a native plant sale with plant donations from the community or an outdoor BBQ to raise funds for your efforts.
- Create a fun workday and recruit parents for help installing and supporting the effort.



Extra Resources

Here are some additional resources to help you plan and execute this action activity.

 Rainwater Harvesting (Toronto and Region Conservation Authority):

https://s3-ca-central-1.amazonaws.com/trcaca/app/uploads/2019/02/11103209/2138_Health_Yards_Rainwater-Harvesting_2019_FA_web.pdf

 Rain Barrels in Schools

<https://www.plt.org/story/rain-barrels/>

 How to Install a Rain Barrel

<https://trca.ca/news/set-up-rain-barrels-harvest-rainwater/>

 How To Install a Rain Barrel: Shawna Coronado and Jim Kleinwachter of the Conservation Foundation work together to teach viewers how to install a residential rain barrel (4 mins.)

<https://www.youtube.com/watch?v=OzG0gbkA47s>