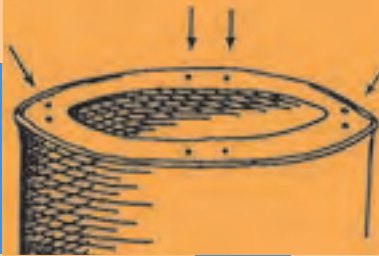


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**APPENDIX D – Rain Barrels**

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# Build Your Own Rain Barrel



## What is a Rain Barrel?

A rain barrel is a container that collects rain water from rooftops (this is called stormwater runoff). Rain barrels come in several different shapes and sizes, but they all do the same thing: they save water and decrease stormwater runoff. Placed at the base of a downspout, a typical rain barrel can hold 55-75 gallons of water at one time. When connected to a watering hose, a rain barrel can hold a water supply for watering gardens, trees, and even indoor plants. Rain barrels can be bought from garden supply centers, or they can easily be built. The Chesapeake Bay Foundation's rain barrel project guide describes step-by-step how to build and install a safe and successful rain barrel. This project is inexpensive and easy enough for most students to complete, with some help from adults. Although our rain barrels are specifically designed with schoolyards in mind, they would work just as well at a home, community center, religious center, or any other private property. All you need is a roof with exterior downspouts!

## Why Install a Rain Barrel?

Did you know that during an average rainstorm (1 inch in 24 hours) more than 700 gallons of water run off the roof of a typical home? That's enough water to take 17 baths or 58 showers! Just imagine how much water might be running off the roof of your school. Virtually every school has a lot of impervious surface (area that rainwater cannot soak into) that affects the quality of stormwater runoff. When rain runs off roofs and lands on impervious surfaces, it cannot soak into the ground. Eventually, it enters a storm drain or a nearby creek. This excess



water or runoff causes the soil in its path to erode more rapidly than it would naturally. Gravity causes this runoff to flow downhill and into the closest stream or other waterway, carrying with it sediment, pesticides, fertilizers, and other pollutants it encounters along the way. Rain barrels intercept that stormwater and not only put it to good use, they also stop it from rapidly pushing the land into rivers and streams.

## Getting Started

Getting started isn't as difficult as you might think. Just follow these steps:

- First, get a teacher or adult leader involved. Ask if he or she would be interested in helping you and your fellow students build and install a rain barrel by providing advice, supervision, and support.
- Before you build anything on the school grounds, you will need to get the approval of the school administrators, such as your principal. It is also important to discuss your plans with the custodial staff at your school—they may even be able to help you with your project, and they will probably want to approve the location of your rain barrel. Some schools have PTA members that are involved in making decisions about the schoolyard; if there are any such groups at your school, it would be a good idea to speak with them as well.
- Next, you will need to choose a location for your rain barrel. This might be partly determined by your principal and/or maintenance staff. The most important aspect in choosing a good spot, however, is figuring out where the rain barrel is most needed.

## Choosing a Location

Deciding where to put your rain barrel can be almost as much fun as building it, especially as the best time to investigate runoff is when it is raining. Don't forget your raincoat! It is important to do some detective work before you purchase any materials so that you can determine the appropriate size barrel and hose length. When you are outside, look closely to see where each downspout is directing water. Is the spout draining into a storm drain or onto an impervious surface? You may find that a downspout is or could be rerouted directly into a landscaped area, gar-

den, or micronursery—in other words, find a place where you can use the water collected in your rain barrel! If this is the case a rain barrel may not be necessary for that particular downspout. *Place your rain barrel where it will collect rain that would otherwise become destructive stormwater runoff.*

### Choosing Your Rain Barrel Design

If you have the funds, rain barrels can be purchased at garden supply centers. They cost from \$40 to \$140, depending on the one you choose. *Here are some resources for buying rain barrels:*

Garden Supply Company (888) 833-1412  
<http://www.gardeners.com/sell.asp?ProdGroupID=12617>

DPI of Portland, Oregon (866) 560-4400, <http://www.composters.net/product/rain/row01.html>

Homestead Gardens, Davidsonville, Maryland,  
 Garden Supply Manager (410) 956-4777

Marty Dutcher (301) 530-5849 Possibilityman@hotmail.com

If you choose to build your own barrel, here is the material list and a sample budget:

### Materials List

- Recycled Barrels: Your local bottling or distribution company. For example, Pepsi-Cola Bottling Co., 1650 Union Ave in Baltimore, offers white 50-gallon barrels (we recommend that you thoroughly wash out the barrel with soapy water before using it for a rain barrel)—\$5.00
- Plastic colander (the colander, located inside the top opening of the barrel, will prevent leaves and debris from entering your barrel)—\$1-3.00
- 1 1/4" barbed fitting with female threaded end—\$1-2.00
- 1 1/4" male coupling—\$1-2.00
- 5' section of sump pump hose—.80-\$1.00/foot
- 1/2" barbed fitting with male threaded end—\$1-2.00
- 5" section of garden hose—\$5.00
- Hose coupler for 5/8" and 3/4" garden hose—\$2.00 each
- Shutoff valve with male and female threaded ends—\$3-4.00
- 1 hose clamp fits 3/8" to 3/4" hose—.75-\$1.00
- 1 hose clamp fits 3/4" to 1 1/8" hose—.75-\$1.00
- 10" x 10" piece of screen material—\$25.00
- Silicone sealant—\$2.50-\$3.50
- PVC glue—\$2.50-3.50
- Aluminum elbow for downspout—\$2.00

### Build Your Own Rain Barrel Sample Materials and Tools Budget

Material	Quantity	Price Each	Total Price	Source
Recycled Barrel (50 gal)	1	\$5.00	\$5.00	Local bottling or distribution co.
Plastic Colander	1	\$2.00	\$2.00	K-mart
1 1/4" barbed fitting with female threaded end	1	\$2.00	\$2.00	hardware store
1 1/4" male coupling	1	\$2.00	\$2.00	hardware store
5 foot section of sump pump hose	5 ft	\$1.00	\$5.00	hardware store
1/2" barbed fitting with male threaded end	1	\$1.00	\$1.00	hardware store
5" section of garden hose	1	\$5.00	\$5.00	hardware store
Hose coupler for 5/8" garden hose	1	\$2.00	\$2.00	hardware store
Hose coupler for 3/4" garden hose	1	\$2.00	\$2.00	hardware store
Shutoff valve with male and female threaded ends	1	\$3.00	\$3.00	hardware store
Hose clamp fits 3/8" to 3/4" hose	1	\$1.00	\$1.00	hardware store
Hose clamp fits 3/4" to 1 1/8" hose	1	\$1.00	\$1.00	hardware store
10" x 10" screen material	1	\$25.00	\$25.00	Bring from home
Silicone sealant	1	\$2.50	\$2.50	hardware store
PVC glue	1	\$2.50	\$2.50	hardware store
Aluminum elbow	1	\$2.00	\$2.00	hardware store

**Total** **\$63.00**

Although the total amount seems very high, you don't need to raise that much money. If you borrow some tools and have some materials, such as the screen, donated, the amount of money you will actually spend is only \$37.50.

## Tools Needed

- Marker—bring from home
- Compass—bring from home
- Ruler—bring from home
- Drill—borrow from maintenance staff
- $\frac{1}{2}$ " spade bit—borrow from maintenance staff
- $\frac{3}{4}$ " &  $1\frac{5}{8}$ " hole saw—borrow from Maintenance staff
- Straight screwdriver—borrow from maintenance staff
- Pliers—borrow from maintenance staff
- Jigsaw—borrow from maintenance staff

## Funding Your Project

Once you have received permission from the right people, figured out how many rain barrels you will need and where to place them, you're almost ready to start building. The next step is getting the money together to either purchase a rain barrel or to build your own barrel. There are many ways to get funding

for all of the things you will need to build your rain barrel. For example, you could hold a fundraiser at your school, or you could ask your principal if there is money in the school's budget. You could also write a grant requesting money from an environmental organization. Below is a list of organizations that offer grants to people like you:

**MARYLAND:** Chesapeake Bay Trust (410) 974-2941  
postmaster@cbtrust.org

**DC:** Garden Resources Of Washington (GROW), 1419 V St. NW, Washington DC 20009 (202) 234-0591 fax: (202) 234-0592

Dept. of Environmental Health—Watershed Protection Division (202) 535-2239

**PENNSYLVANIA:** PA Bay Education Office, 4999 Jones Town Rd. Suite 203, Harrisburg, PA 17109 (717) 545-8878

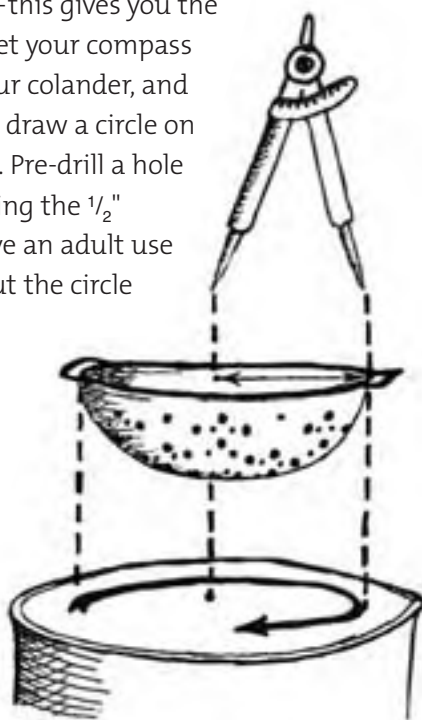
**VIRGINIA:** Chesapeake Bay Restoration Fund Advisory Committee; (804) 786-3591 [www.dls.state.va.us/cbr-fac.htm](http://www.dls.state.va.us/cbr-fac.htm)

## Building Your Rain Barrel

The following step-by-step directions will help you successfully create your rain barrel. Some tools and parts can be substituted for similar objects—be sure to check with your adult helper to figure out what will work best for your group.

### 1. Create a Hole for Your Downspout

Measure the diameter of your colander, and divide by two—this gives you the colander's radius. Set your compass for the radius of your colander, and use the compass to draw a circle on the lid of the barrel. Pre-drill a hole inside this circle using the  $\frac{1}{2}$ " spade bit. Next, have an adult use the jigsaw to cut out the circle you have drawn.



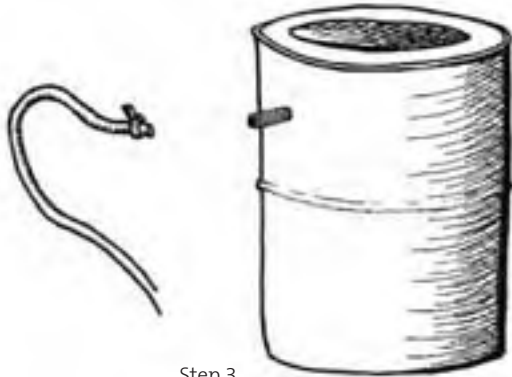
### 2. Create the Drain and Overflow Holes

Choose a spot on the side of the barrel for your lower drain hole (an inch or two up from the bottom of the barrel) and cut it out with the  $\frac{3}{8}$ " hole saw. Next, choose a spot on the other side of the barrel for the overflow hole (near the top of the barrel) and cut it out with the  $1\frac{5}{8}$ " hole saw.



### 3. Install the Overflow Hose

A) Coat the threads of the 1 1/4" white male coupling with silicone sealant. From the inside of the barrel, push the threads of the coupling out through the upper overflow hole.



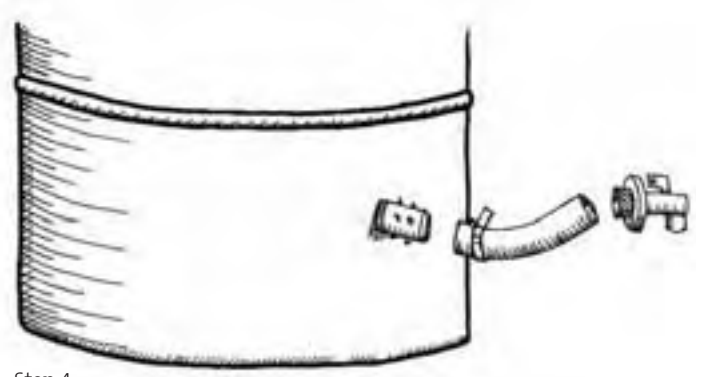
Step 3

B) Screw the gray 1 1/4" barbed fitting onto the threads of the white male coupling.

C) Place the large hose clamp onto the 5 foot section of sump pump hose and attach it to the 1 1/4" barbed fitting at the overflow. Tighten the hose clamp.

### 4. Install the Garden Hose

A) Coat the threads of the gray 1/2" barbed fitting with silicone sealant. From the outside of the barrel, screw the barbed fitting right into the lower drain hole.

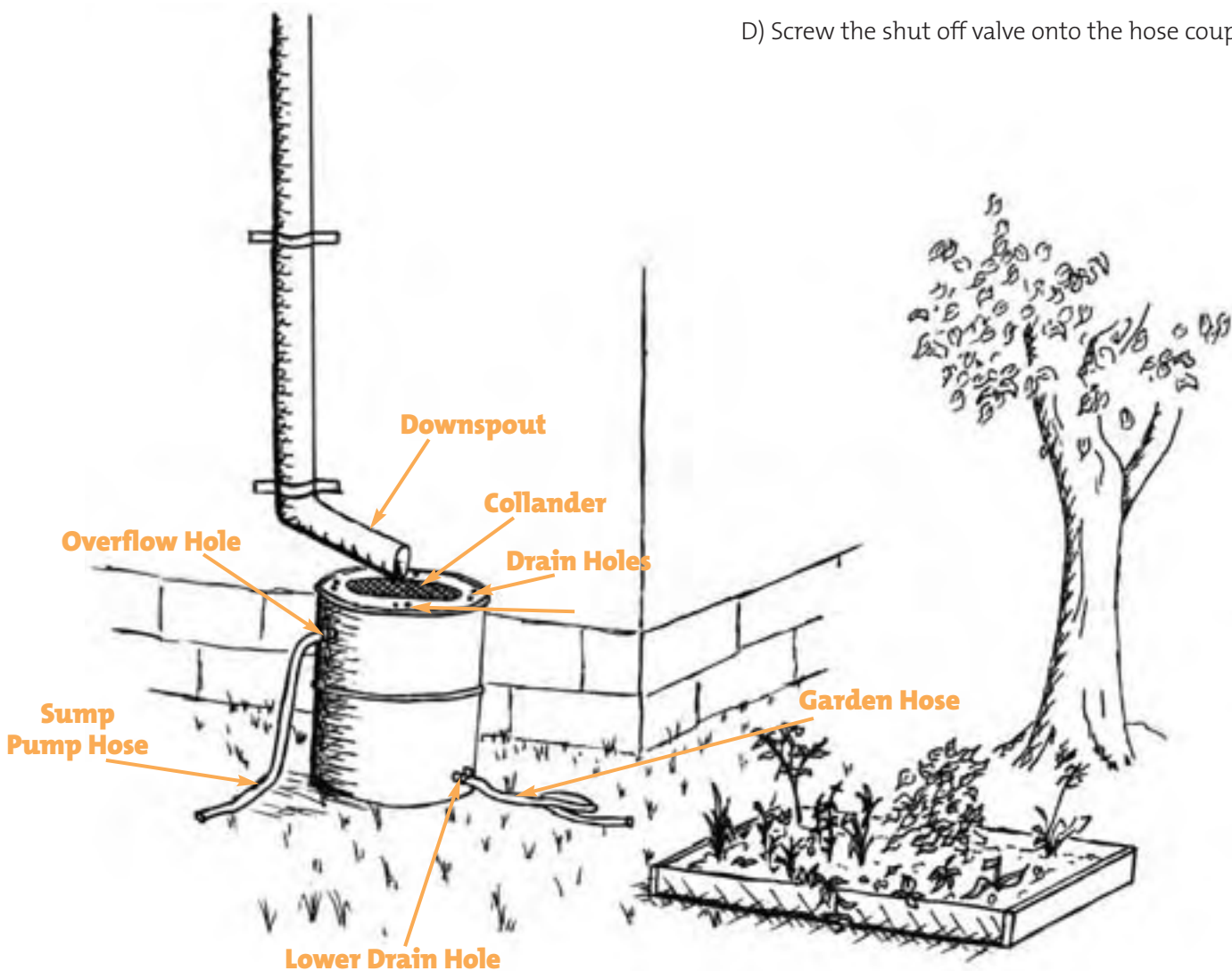


Step 4

B) Put the small hose clamp onto one end of the 5-inch section of garden hose. Push the hose onto the barbed fitting and tighten the clamp.

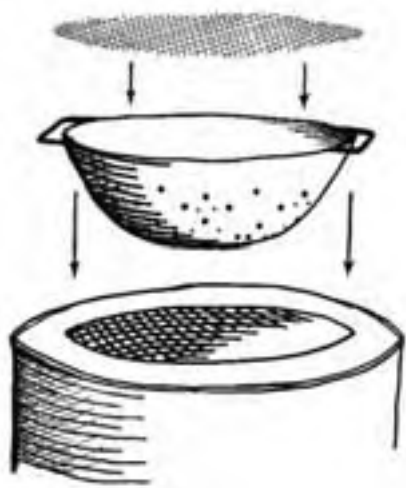
C) Attach the hose coupler to the other end of the 5-inch section of garden hose.

D) Screw the shut off valve onto the hose coupler.



### 5. Prepare the Colander

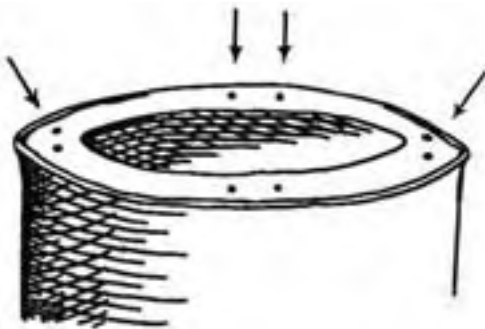
Cut your screen material so it will fit on top of the colander. Use PVC cement to seal the screen to the lip of the colander. Set the colander into the hole on the top of the barrel.



Step 5

### 6. Add Some Finishing Touches

Use a drill bit to insert drain holes around the inside of the barrel lip. This will allow water to drain into the barrel and prevent standing water from collecting on the lid.



Step 6

### 7. Attach Your Barrel to Your Downspout

Aim the downspout into the rain barrel, so the barrel will collect rain water. You can do this by first cutting your downspout to the appropriate height (about one foot higher than your rain barrel is tall). Then, attach the downspout elbow onto the end of the downspout. Aim the elbow so that it will direct water into the hole at the top of your rain barrel. You may want to "glue" the elbow into place with the silicone sealant.

### 8. Maintain and Care for Your Rain Barrel

Rain barrels require very little maintenance. Just be sure to empty them between rainstorms and check to make sure the downspout is still directing water into the barrel. A good follow-up project is to plant a rain garden at the base of your overflow hose.

**Congratulations!** You have successfully completed your rain barrel, and you know how it will help to conserve water and protect our streams and rivers from stormwater runoff. Now it's time to spread the word.

You may want to make a sign explaining the purpose of your barrel.

Some students paint right on their barrels, decorating them with pictures that describe the important function of the rain barrel.

Every barrel that slows water on its way to the Bay contributes toward creating a healthy Bay.

## Rain Barrel Budget

Material	Quantity	Price Each	Total Price	Source

The Chesapeake Bay Foundation is the foremost conservation organization dedicated solely to saving the Chesapeake Bay. Its motto, *Save the Bay*, defines the organization's mission and commitment. With headquarters in Annapolis, Maryland, state offices in Maryland, Virginia, and Pennsylvania, and a varied group of educational centers and programs, CBF works throughout the Chesapeake's 64,000-square-mile watershed. Founded in 1967, CBF is a 501(c)(3) not-for-profit organization. CBF is supported by more than 110,000 active members and has a staff of 150 full-time employees. Approximately 95 percent of CBF's \$19 million annual budget is privately raised.

The Student BaySavers program, directed by CBF's education department and funded by CBF supporters, strives to involve students from around the watershed in hands-on project that will help improve the water quality of the Chesapeake Bay. For more information and action ideas that help Save the Bay, visit [www.cbf.org](http://www.cbf.org), where you can find out about events going on around the watershed and read the quarterly newsletter, *Megalops*.



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