

RAIN BARREL WORKSHOP

**-ASSEMBLY-
-SITING AND INSTALLATION-
-USE AND CARE-**

Pequannock
Environmental Commission

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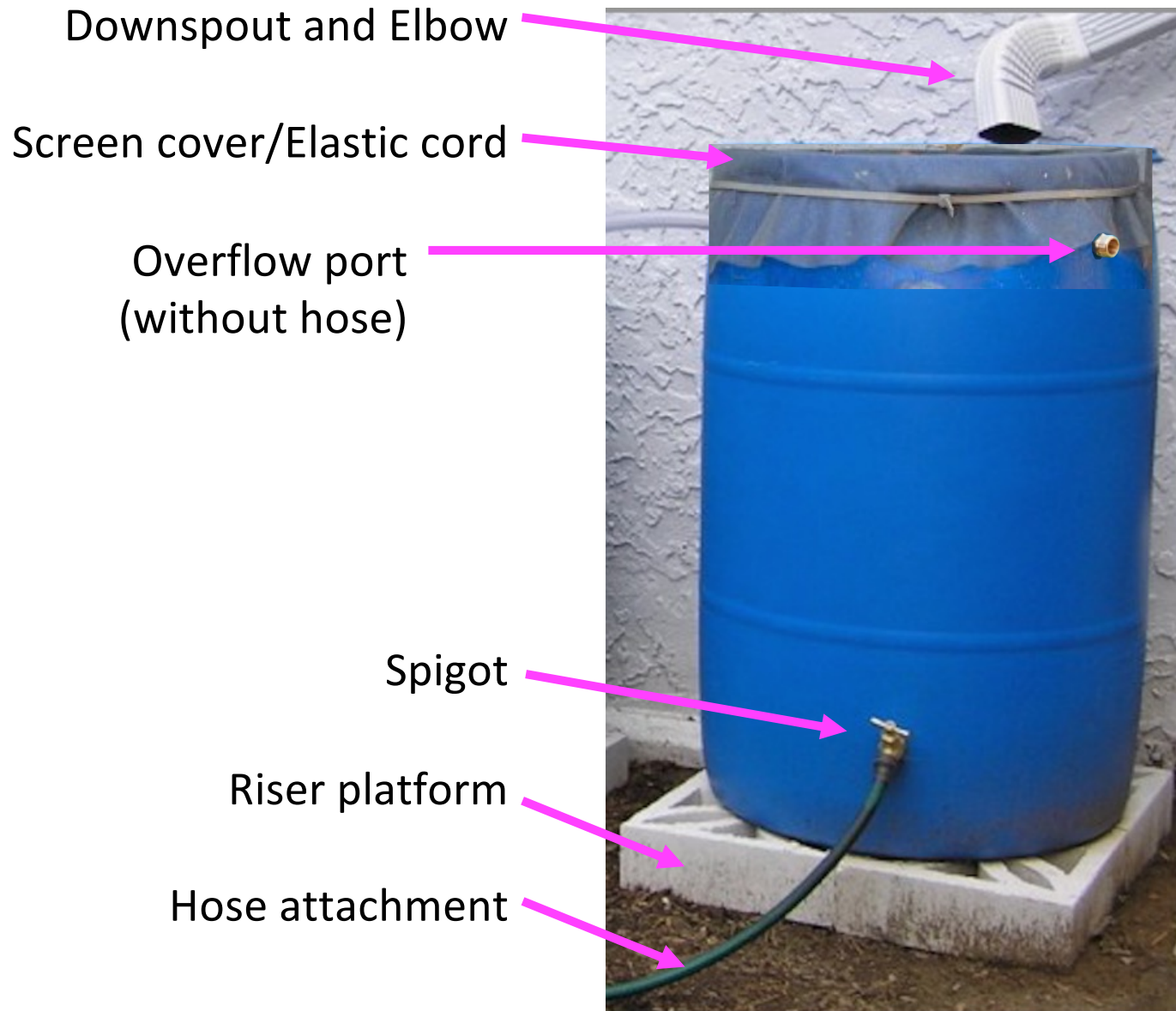
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INTRO: RAIN-BARREL PARTS



RAIN-BARREL BENEFITS

1. Provides water for landscaping, may be more convenient than using a connected hose, and can be set up to “automatically” send more rainwater to certain plants every time it rains.



2. Conserves drinking water
 - a. Less for town to pump/treat/use
 - b. Saves money on your water bill



3. Reduces roof runoff
 - a. Less pollution entering streams
 - b. Less street and stream flooding



Concept: **Bigger Roof Area***
and/or **More Rain** = **More water in barrel**



$$\begin{aligned} & \text{GUTTER LENGTH (feet)} \\ & \times \text{ROOF PANEL WIDTH (feet)} \\ & \times \text{RAIN DEPTH (inches)} \\ & \times \underline{0.623 \text{ (conversion factor)}} \\ & = \text{HARVESTED WATER (gallons)} \end{aligned}$$

www.rainwaterharvesting.tamu.edu

* Note: The roof area contributing rain to the barrel is the *horizontal* “footprint” of the roof portion draining to the barrel, and can be calculated as the gutter length times the “roof panel width” (the horizontal distance between the roof peak and the gutter, as shown on diagram).



HOW MUCH RAIN CAPTURED?

Concept: **Bigger Roof Area***
 and/or = **More water in barrel**
 More Rain*

Example: Volume Collected for Different Rain, Roof Sizes

Rain (<u>inch</u>)	<u>Contributing Roof Size</u>		
	<u>10ft x 10ft</u>	<u>20ft x 20ft</u>	<u>30ft x 20ft</u>
0.1	6 gallons	25 gallons	37 gallons
0.2	12 gallons	50 gallons	75 gallons
0.5	31 gallons	125 gallons	187 gallons
1.0	62 gallons	250 gallons	374 gallons

FULL
55-gal
Barrel
holds
~50+ gal

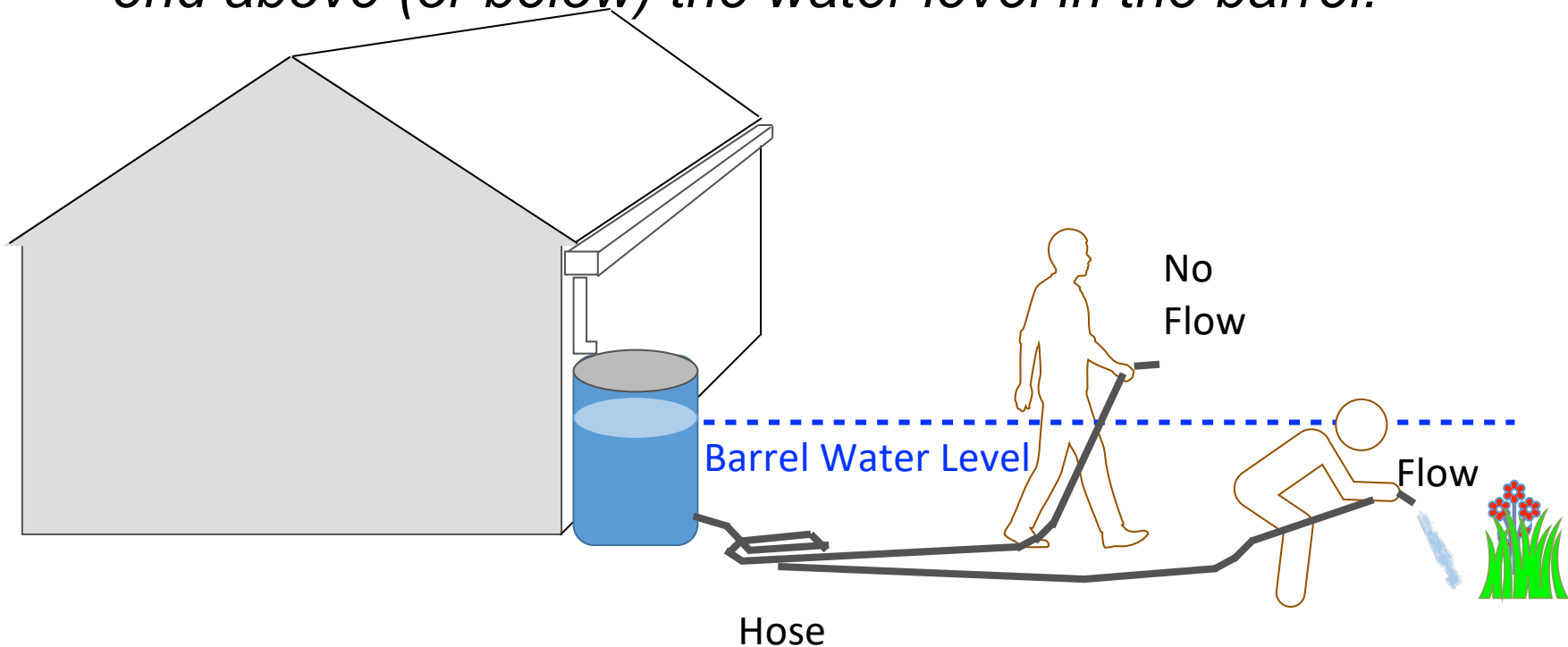
USING RAIN BARRELS

1. Keep spigot closed until ready to use water.
2. The barrel will keep filling each time it rains and will fill to the top if you don't use the water first.
3. Once full, the barrel will overflow. To avoid overflow water at your foundation, connect a hose to the overflow spout and place the free end away from your foundation.
4. Collect water from the barrel into a bucket/watering can, or connect a hose to the spigot.



USING RAIN BARRELS

4. Gravity (not line pressure) controls flow through a hose!
- a) If the hose's free end is *below* the barrel's water level, water will flow out the hose.
 - b) If the hose's free end is *above* the barrel's water level, water will NOT flow out the hose.
5. *Tip: you can turn the flow "off" (or "on") by lifting the hose end above (or below) the water level in the barrel.*



TIPS FOR RAIN BARRELS

1. **Never** drink water from a rain barrel. Consider roofing material before using rain barrel water for garden vegetables.
2. **Always** screen-off barrel openings to keep out mosquitos.
3. Raise barrel on blocks to provide higher flow rate and easier access to the spigot, *but make sure the barrel is stable*.
4. Debris can clog your spigot and keep the barrel from draining. Prevent clogs by clearing debris from the top screen after each rain, and by periodically cleaning out the barrel.
5. Barrel clean-out procedure:
 - a) Drain the barrel through the spigot.
 - b) Remove top screen.
 - c) Carefully tip barrel on its side (*do not “roll” on the spigot*), and use a pressurized hose to rinse the inside.
 - d) Turn barrel upside down to empty it of water and debris.
6. Do not allow water to freeze in barrel - this may damage the barrel and/or the spigot. Store barrel upside down in winter.

Search “Rain Barrel Education” for more tips!

Rain Barrel Conversion - Parts List

- Rain Barrel (*white shown*)

- Parts:

- Spigot port



- Spigot valve



- Overflow port



- Screen & elastic



- Tools

- Eye protection (safety goggles/glasses)
 - Metal socket (or nut) to use as a weight
 - Drill with 27mm (1 1/16") saw-hole bit
 - Adjustable wrench (for 1.5" nut)
 - Scissors

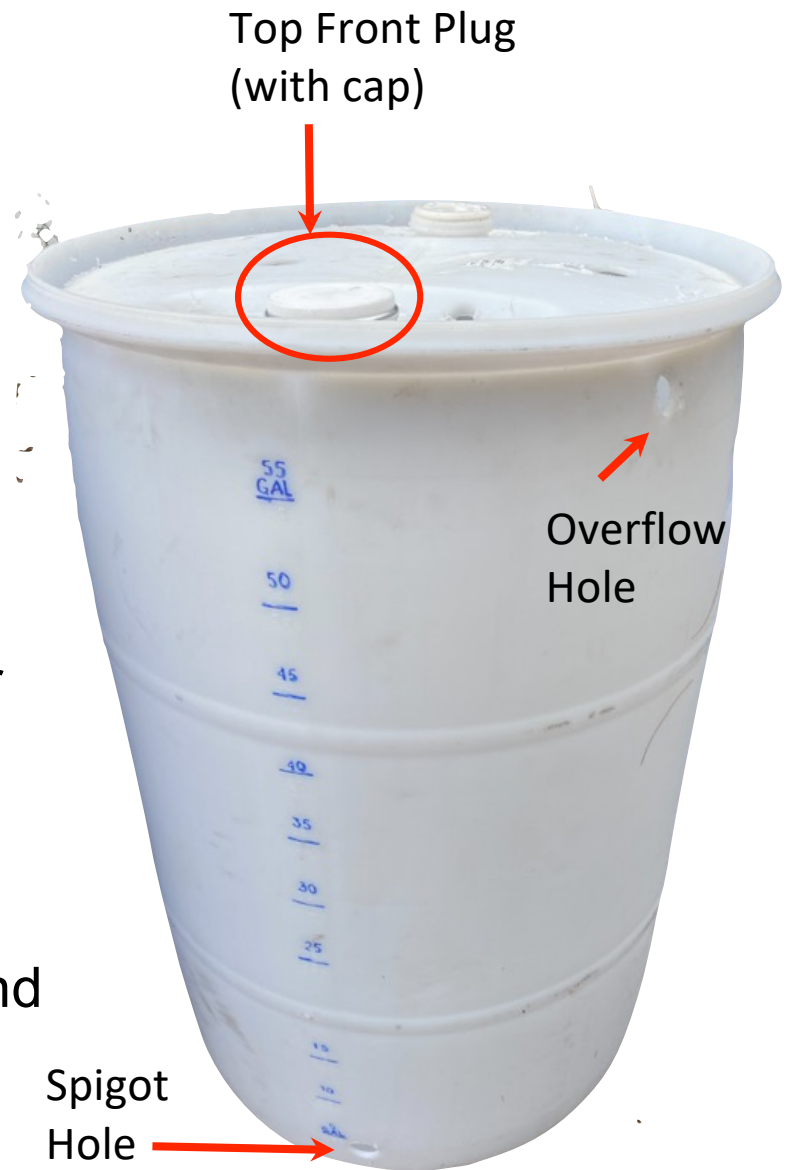
- **Some other items you may need at home for installation:**

- Hack saw or reciprocating saw (to shorten your downspout)
 - 2-3 concrete blocks or bricks (optional)



Rain-Barrel Assembly Instructions

1. Collect your barrel & hardware in your work area. *Note: some barrels have embossed fill-volume indicators; we marked them with a Sharpie here: If you'd like to use these, find them and use that as the "front" of the barrel.*
2. Drill 27mm diameter access holes for:
 - a) Spigot: about 3" above the bottom, at the front of the barrel. (*If you are NOT placing the barrel on blocks or a pad, move the hole higher by 2"*).
 - b) Overflow: 2 to 3" below the top rim, to the left or right of the front by 45'.
3. Remove the front cap (if there is one), and unscrew the front plug. *Tip: if the plug is tight, try a screwdriver or tool handle to help loosen it, or try the other plug.*



Rain-Barrel Assembly Instructions

4. Create a "guide wire" to ease installation of the spigot.

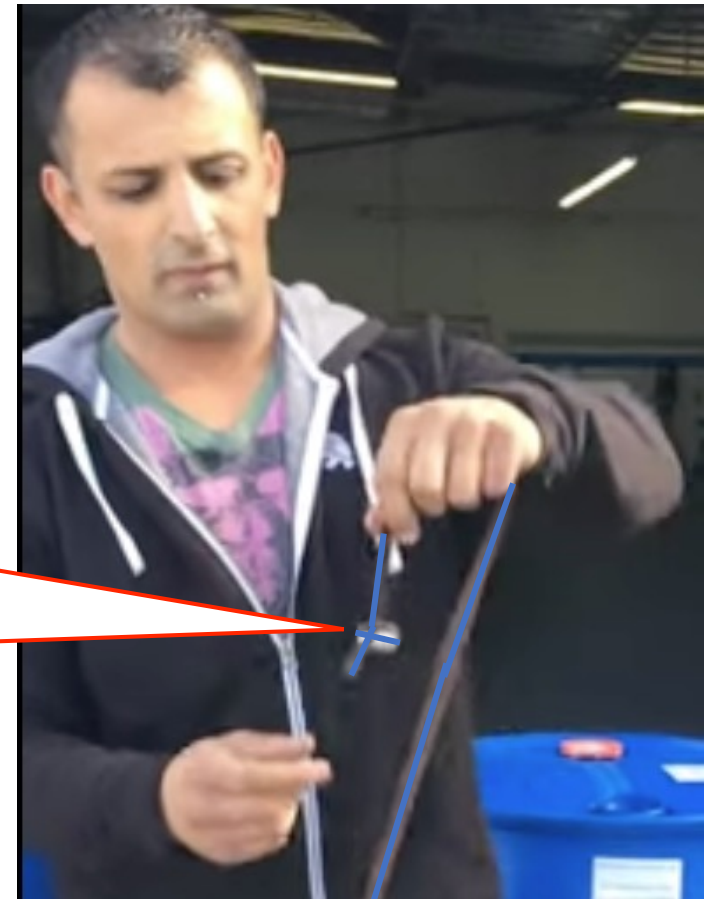
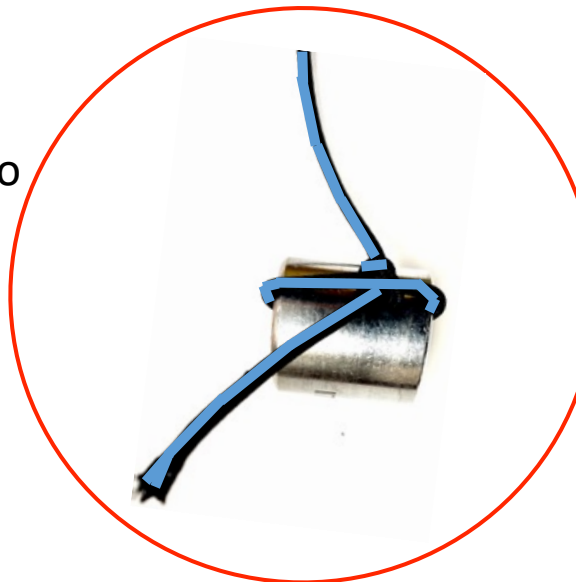
a. Find your elastic cord and unwind it:



b. Tie one end of the cord to a small weight (we'll use a socket).

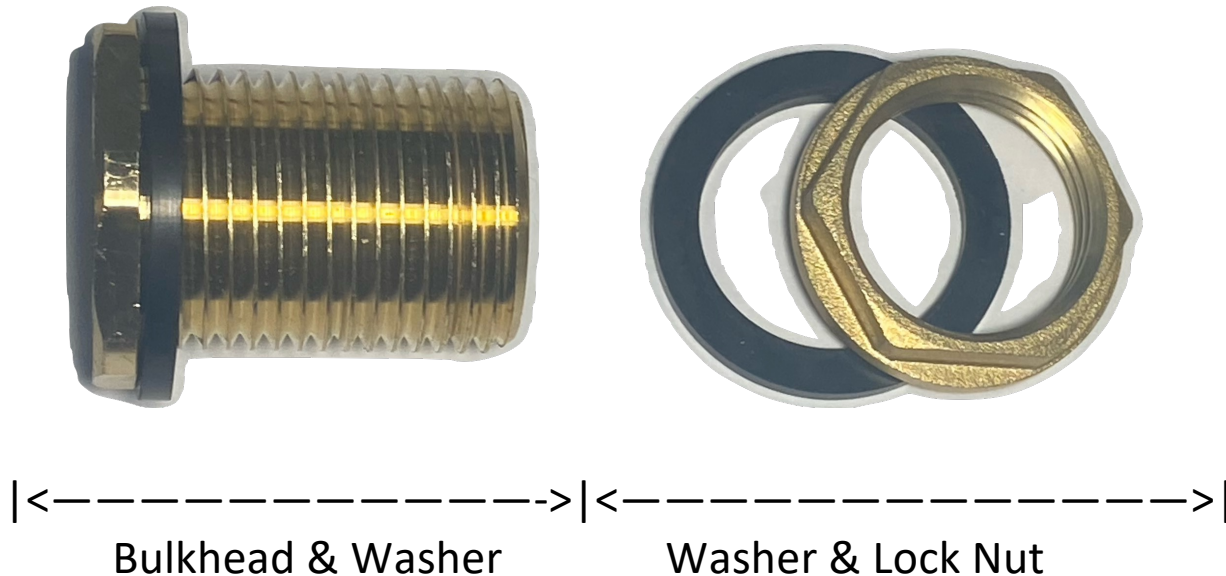
TIP: don't tie too tight, as you will be untying it soon.

Cord tied to a socket.



Rain-Barrel Assembly Instructions

5. Find your metal spigot port and separate it into these parts:



6. Return the locknut/washer to the box/table for now.
7. Get the bulkhead & washer piece and the cord & socket – you will need both in reach for the next steps.

Rain-Barrel Assembly Instructions

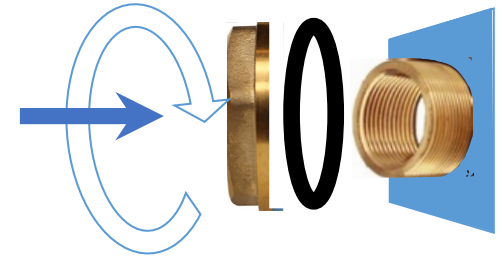
8. We will now install the spigot's bulkhead fitting.
- TIP: see the figures at right for each step:*
- Holding the cord's non-weighted end at the top, drop the weighted end into the barrel *through the front top plug hole* so that it falls near the spigot hole at the bottom.
 - Keep holding the cord at the top. Use your finger or a magnet to pull the cord's weighted end out through the spigot hole. Set it on the floor. You may need to tilt the barrel. *TIP: step on the socket so it won't re-enter the barrel.*
 - Keep holding the cord, then:
 - Get the bulkhead and thread the cord's free end into the bulkhead's threaded end.
 - Drop the bulkhead into the barrel's open plug hole. *The cord will "guide" the bulkhead's threaded end toward the hole.*
 - Keep holding the cord. Poke a finger through the bulkhead and pull so the threaded end protrudes and it sits snugly against the wall.
 - Release the top of the cord, pull the cord out the spigot hole and set it aside.



Rain-Barrel Assembly Instructions

8. (continue with bulkhead assembly)

- f) Get the locknut & washer. First, put the washer onto the bulkhead, then, being careful not to push the bulkhead into the barrel, screw the locknut clockwise onto the bulkhead. For now, just hand tighten.



9. Now we'll fix the spigot valve orientation.

- a) Get the spigot valve and screw it (clockwise) onto the bulkhead. Hand tighten only.
- b) If the valve lever is not on top, loosen the locknut if necessary to twist (carefully) the assembly until the valve is on top.
- c) Hand tighten the locknut. Then use a large wrench to tighten until snug; do not overtighten as that may crack the barrel and cause leaking.
- d) *TIP: until your barrel is installed at home, detach the valve and place the brass end cap on the bulkhead. This will protect these crucial parts. When ready, re-attach the spigot valve.*

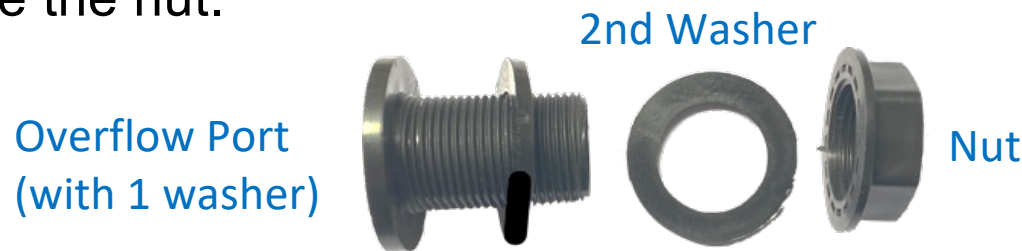


Rain-Barrel Assembly Instructions

10. Now we'll install the overflow port into the overflow hole.

Tip: this process is similar to the spigot port installation.

- a) From the kit, get the overflow port and remove the nut.



- b) Thread the cord's free end in through the threaded end of the overflow port.
- c) Locate the barrel's open (top) plug hole and overflow hole.
- d) While holding the overflow port and cord's free end, drop the cord's weighted end into the open (top) plug hole.



Rain-Barrel Assembly Instructions

10. (Overflow port installation, continued)

- e) Holding the cord's free end, pull the socket end out through the overflow hole. *Tip: if you can't reach the cord to pull it out, tip the barrel so the cord moves near the overflow hole, **being careful not to knock or roll over the spigot, which could break it.***
- f) Step on the cord's weighted end to hold it to the floor.
- g) While holding the cord's free end, drop the overflow port into the top plug hole. Use the cord to guide the overflow port to the overflow hole.
- h) Use a finger to pull the overflow port so that the threaded part protrudes from and sits snugly against the barrel wall.
- i) Put the washer onto the threaded portion of the overflow port, ***being careful not to push it back into the barrel.***
- j) Screw the overflow nut onto the overflow port and hand tighten. Use an adjustable wrench or pliers to make snug.
Tip: do not over tighten, as the barrel may crack.

11. Replace the top plug (and cap, if it came with one).

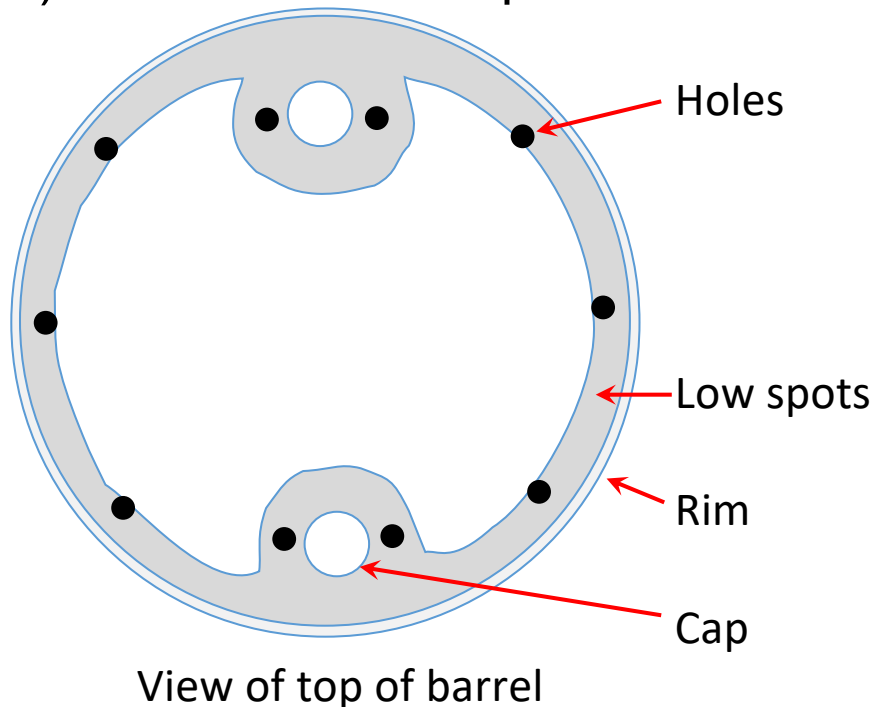
12. Untie the socket from the cord. Keep the cord for a later step.

Rain-Barrel Assembly Instructions

13. Please use eye protection (like safety glasses) for this step.

Drill large (1.25" – 2" diameter) drain holes in the top of the barrel. These will allow water from your gutter to enter the barrel, but will keep out larger debris (like sticks and leaves) and will prevent animals or children from accidentally falling into the barrel.

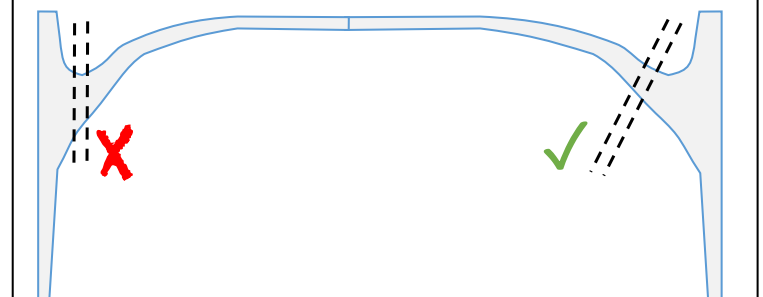
- You will need 10+ holes all around the top for proper drainage.
- Placing the holes in the "low spots" (shaded areas below) allows the collected water to enter the barrel.
- Recommended placement of holes:



TIP:

The barrel plastic is thicker where the side meets the top. Putting the holes nearer to the barrel's *interior* -- and drilling them diagonally toward the center of the barrel -- is *much* easier than drilling straight down.

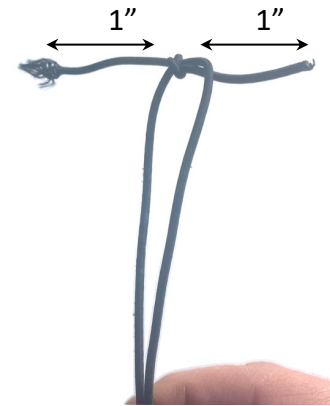
Side Cut-away View:



Rain-Barrel Assembly Instructions

14. Please use eye protection (safety glasses) for this step.

- a) Take the elastic cord and tie a knot so there is about 1" of cord left on each free end as shown:
- b) Slip the cord over the lip around the top of the barrel. It should fit snugly, not too tight.
- c) *Tip: the elastic cord enables easy removal of the screen when needed (like when you need to dump the barrel to clean it out).*



- 15. Get the screen and center it over the top of the barrel. There should be at least 2 inches overhanging the rim all the way around.
- 16. Hold the screen in place with one hand and use the other hand to move the cord up around the screen. Work your way around until the cord holds the screen all the way around the barrel.
- 17. If you wish to have a tidy appearance, use the scissors to trim the screen (just don't make it too small!)



CONGRATULATIONS your rain barrel is assembled!

Rain-Barrel Siting Considerations

1. Important issues to consider *before* placing your barrel.
 1. Barrel must be placed at a downspout. Single-story downspouts are simpler to install than multi-story downspouts.
 2. *Tip: the larger the roof area leading to the downspout, the more rain you will collect for a given storm (see page 6).*
 3. Ground under barrel must be level, or made level by making a stable platform using concrete blocks or bricks. (Wood may rot over time, which may cause the barrel to tip or fall over – very dangerous).
 4. Barrel should not be near ledges, chairs, etc. upon which children may climb and topple the barrel. Consider securing barrel to wall.
 5. To make use of a hose attachment, barrel spigot must be *higher* than the areas to be watered, and within a distance that the hose will reach. Otherwise you can use a bucket/watering can.
 6. Roof areas under or near trees are more likely to clog barrel with debris.
2. After deciding where to put the barrel, level out the ground in that area.
3. If you want a pad or riser platform for your barrel, make sure it is level and that the barrel is stable on top of it.



Downspout Connection Instructions

1. *Tip: the wide variation in gutter/downspout configurations means you'll need to adjust these instructions to suit yours!*
2. Decide if you want to purchase a new downspout/elbow or use what's existing. *Tip: we recommend keeping the existing downspout for winter, and using a different downspout piece for the rain barrel. A new 2"x3" downspout costs about \$10 per 10-ft length, a new elbow costs about \$5.*
3. Remove the existing downspout, or the lower segment of a multi-segment downspout. *Tip: this may require a ladder, and perhaps a screwdriver if the downspout is anchored to the wall or to the gutter. **Be very careful!***
4. Measure the downspout length needed to reach the barrel. *Tip: we recommend using an elbow (rigid or flexible) at the bottom of the downspout to divert flow onto the top of the barrel, and anchoring the downspout to the wall, which provides more wiggle room for the barrel.*



Downspout Connection Instructions

5. On a workbench or other stable surface, use a hack saw or reciprocating saw to cut the downspout to the marked length. **When cutting, use eye protection and be very careful of sharp edges.**
Tip: Use a file to remove sharp edges from the cut ends of aluminum.
6. Reconnect the downspout to the protruding fitting on the underside of the gutter, anchor the downspout to the wall, and connect the lower elbow piece so that it will discharge over the widest part of the rain barrel.
7. *Tip: if your downspout is not anchored to the wall, it may be loose; to prevent it from falling, either anchor the downspout to the wall or, in a pinch, place a wedge under the elbow to stabilize the downspout.*
8. Contact us at PTEC@pegtwp.org if you need help.

Congratulations on completing your rain barrel installation!

