



# Clean Water for Life: Water Filtration and Chlorination



# Creating your Clean Water Bucket

## Materials required:

1. Two 20 liters (5 gallon) food-grade buckets with lids
2. Two 24 oz. water bottles with bottom cut off
3. ½ inch hose bibb (one)
4. Two rubber hose washers
5. ½ inch CPVC female thread adapter
6. PTFE thread seal tape ¾ inch by 300 (8.33 yds.)
7. One Sawyer water filter

## Tools required:

1. Ratcheting screwdriver with 7/8<sup>th</sup> and ½ inch spade bit
2. 1 ¼ inch spade bit (for hole in top of bucket)
3. Utility knife
4. Dips/strips for measuring chlorine in water
5. Ruler

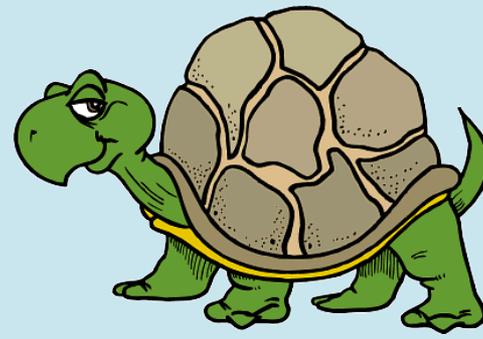


Timmy Turtle and his family will guide us through the clean water PowerPoint today.



Timmy Turtle has a Master's degree in Hydrology from the University of Swamp. Timmy Turtle has a great knowledge of clean water buckets.

In his spare time Timmy Turtle enjoys sunbathing, swimming, and yawning.

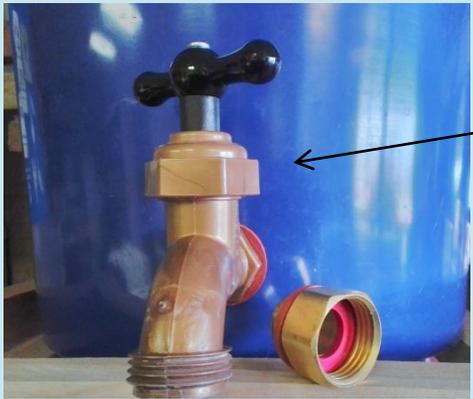


This is Grumpy turtle. Even though he's a grump, he still cares about your clean water and wants to be sure you know what your supplies look like.

Drill spade bits,  
Stir stick,  
Water bottle with bottom removed, 2 liter bottle with bottom removed (for holding plunger and syringe)



Stirring Stick



Hose Bib



Food-grade five gallon buckets





Okay, we're going to start by drilling the hole in your first 5-gallon bucket.

- Use your ruler to mark approximately 6 cm (2.36 in.) from the bottom of the bucket.

- Place the bucket between your legs to hold firmly in place and use your 13/16<sup>th</sup> spade bit to drill a hole.

- Remove the burrs from the edges of the hole. Some warnings about removing the burrs...



Notice the burrs on the edge of the hole. These need to be thoroughly, absolutely scraped off to create a smooth opening, as the burrs could eventually cause your bucket to leak. Use your thumbnail or spade bit to scrape off the hanging burrs.

# Making the Perfect Hole...



The importance of drilling a perfect hole and removing every single burr from it should not be underestimated. It is the one tedious aspect of your bucket and is slow, like, well, like a turtle. Using a small power drill is recommended to save the strain on your wrists, and a pocketknife works well for removal of burrs.

Drilling hole by hand:

3-6 minutes



Drilling hole with small power drill: App. 1 minute



Thorough removal of all burrs:

5-10 minutes





I'm Junior Turtle, and I'm very happy today to give you a few instructions on how to install the Adapter, washers and bibb into your bucket. The "bibb" is the spout you will drink from.



1. Wrap a few layers of thread tape around the threads of the bibb to prevent leaks.

The washer must be completely snug against the base of the bibb. It should look like the model on the right. You may proceed to screw it into the front of your clean water bucket.



2. Place the first rubber washer on the threads so that the beveled side faces out toward the other washer. The plastic nut will slide against the seal ring.





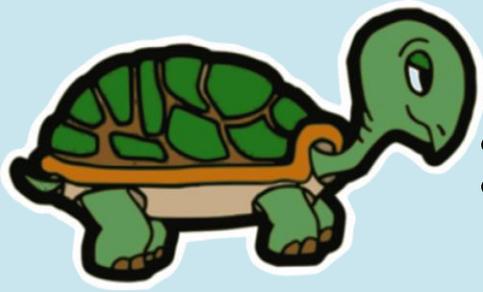
**Place the second washer on the threads inside the bucket, beveled side facing the bucket. Screw the plastic nut in inside the bucket until it is firmly sealed with the washer against the bucket.**

**You may use caulking to help seal the washers, but it is recommended to use gloves as the caulking is extremely sticky.**



**Good job, you now have a usable spout for your clean, filtered water.**





- Hey everybody, umm I'm Dopey Turtle and I'm going to help you...shoot, I forget what I'm here for. OH yes....I'm going to help you with preparing your lid:



Use your 7/8th inch spade bit to drill a hole in the center of your clean water bucket lid. Next, use the utility knife or scissors to cut off the bottom of a 20 ounce water bottle. Push the neck of the water bottle through the hole.

Repeat this process with a 2 liter bottle for the filter bucket.

This will hold your plunger and syringe when not in use.



**So we're moving right along and you now have a receiving funnel for your Sawyer filter to sit in. Your clean water may now travel seamlessly into the clean water bucket.**



**Do not throw your water bottle cap away, as you will screw this onto the underside of the bucket when you are not using the filter to prevent bugs or other contaminants from getting into your water supply.**



Hey everyone, my name is Sprinter. I'm a super fast turtle, that's why I wear running shoes in the pond. How about I give you a hand attaching the filter to your untreated water bucket?



Repeat the process of drilling a hole 6 cm. above the base of your second 5-gallon bucket for untreated water.

Screw the hip attachment that comes with your Sawyer water filter into the hole. Secure it from inside the bucket with the black Sawyer plastic nut.

Attach the filter hose that is connected to your filter to the hip attachment . Use pliers or a rag to affirm the filter is absolutely snug and incapable of a leak. Hang the hook of the filter on the bucket until you are ready to use.

You now have a connected Sawyer water filter to your dirty water bucket.





- A big reminder to anyone who is looking forward to trying out your freshly filtered, clean water:
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It is recommended to fill your dirty water bucket all the way to the top before you filter any water. This way when you chlorinate the water, you will be able to put a consistently accurate amount of bleach in each time you filter.



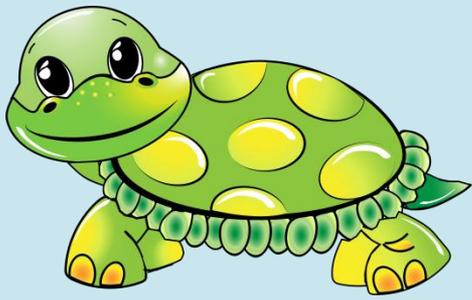
Place the untreated bucket on a table high enough that the hose can have full extension to the bucket on the floor.



Now before you drink this delicious water, it's time to chlorinate. But before we chlorinate, let's clean the filter...

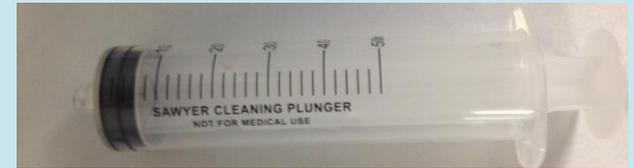
Your dirty water is awaiting filtration.





**Hiii! Call me Bubbles. I'm going to tell you  
: exactly how to clean your filter through the  
process of "backwashing":**

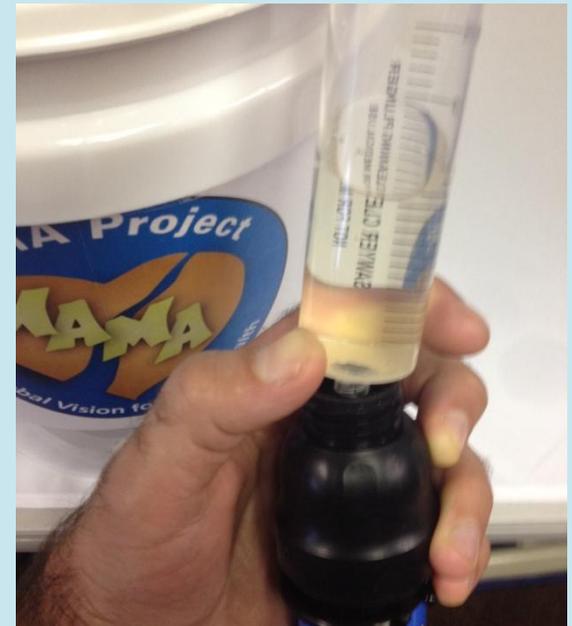
**You should clean the filter after each use to  
keep it clog-free. To do this, use the plastic  
plunger from your Sawyer water kit.**



**DO NOT USE CHLORINATED WATER TO  
BACKWASH, AS IT IS UNSAFE TO MIX  
CHLORINE AND ORGANIC MATTER FOUND IN  
UNTREATED WATER.**

**Fill the plunger with filtered water only, and  
squeeze the plunger into the filter opening  
forcefully. Do this 3 times in order to wash the  
dirt out of the filter.**

**Now it's time to chlorinate...**



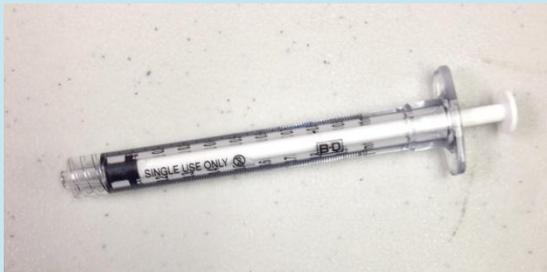


Chlorination is extremely important to keep nasty viruses out of your water.

- In order to chlorinate, you'll need a couple items:

## Materials needed:

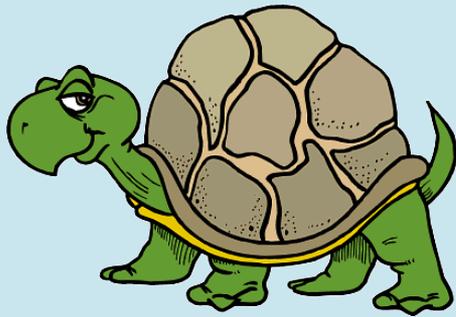
- Dips/strips for measuring chlorine in water
- One syringe or dropper
- Bottle of household bleach with cap



Syringe for bleach drops ↑



TESTING STRIPS



Grumpy Turtle here again. Let me just give you some important standards for chlorination real quick so I can get back to my log nap.

- The WHO standards for chlorination are .2 mg per liter minimum chlorine and 5 mg maximum.
- When testing your chlorine, you want to have between 1-2 ppm of free chlorine left in the bucket.
- $\frac{1}{2}$  a cc of chlorine creates 1.5 ppm of free chlorine in a 5-gallon bucket.

**1 cc chlorinates one five gallon bucket.**



- Okay now, let's go through the actual
- chlorination process.

Your bleach should be stored in a pill bottle for easy access. The bleach instruction/warning labels are included with MAMA filter kits. Remember, you only need basic household bleach.

**DO NOT USE PERFUMED BLEACH.**

Use your syringe/dropper to remove 1 cc of household bleach.

Squirt it into your filtered water, and now it's time to stir the bleach with an "agitator" to evenly distribute it in the bucket.



# The Importance of “The Agitator”



- When chlorinating, the household bleach, the bleach will not disperse evenly throughout the bucket on its own. To ensure that the entire bucket is sterilized evenly, you will need to stir the water before drinking using an “agitator”, which in its resting state will sit in a slit in the bucket lid.

## Materials needed for Agitator:

- 24 inch stirring rod included with filter kit

**\*\*All materials should be brand new or cleaned in bleach before entering your clean water bucket!\*\***

# The “Agitator” or “Stirring Stick”



24 inches

Use your 1/2 inch diameter spade bit to cut a hole

Hole should be cut from the underside of the bucket so any plastic residue does not fall into your clean water.

The stirring stick can rest in the slit at all times and should not be removed in order to remain sterile.



# “Agitating” and Storing your Bucket System:



“Agitator”, Sawyer filter plunger, and chlorine syringe resting positions when bucket not in use.

After chlorinating, move the stir stick back and forth at least 12 times to properly mix the bleach into the water. You may then test your water with the Hach chlorine testing strips (demonstrated in next slide). Screw your bottle cap lid into the bottom of the bucket lid. You may now rest your plunger and syringe in the pill bottle opening and your water is now filtered, chlorinated, stirred, and safely covered by the pill bottle cap to protect from contaminants.

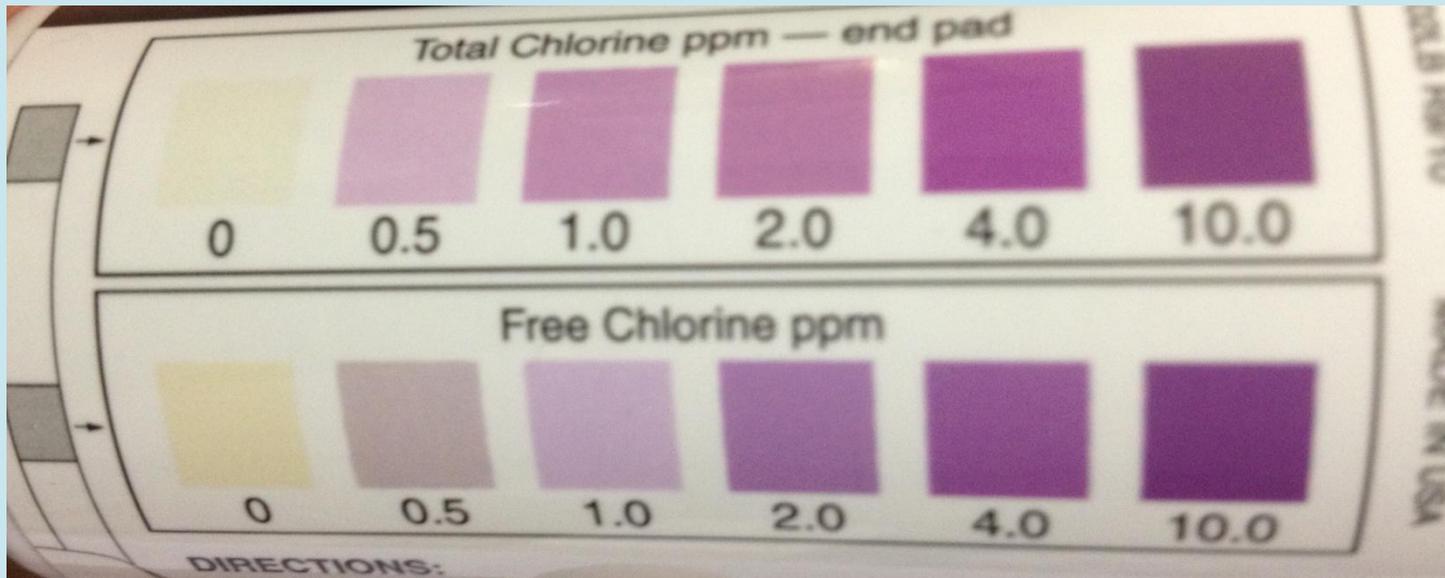


- Sprinter Turtle here again. Did I mention that I'm really super fast? Like, so fast. I'm going to show you how to test your water to make sure it's properly chlorinated:

After thoroughly mixing your water with the agitator, use one of the Chlorine test strips by swirling it around in your filtered, chlorinated water for approximately 30 seconds.

**IF YOU DO NOT SWIRL THE STRIP FOR AT LEAST 30 SECONDS, YOU WILL NOT GET AN ACCURATE READING.**

Use the PPM chlorine scale to gauge if your clean water is properly chlorinated and virus-free. Your testing strip should look somewhere in between 1.0 and 2.0.



# Alternative Method of Chlorination: Calcium Hypochlorite

Since non-perfumed household bleach is not always readily accessible, there is another way that is highly efficient to chlorinate your water.

What you will need:

- Two liter bottle
- Scissors
- High-test Calcium hypochlorite, or “pool shock” from any store with pool supplies
- Blue screw-on adapter (included with filter kit)
- One teaspoon measuring scoop (equivalent to one 5cc scoop)





This method is tested for 56.44% calcium hypochlorite. If using higher strength pool shock, use slightly less than 1 cc of the solution in your dropper.



Use your blue screw on adapter to attach an upside down bottle to your 2 liter bottle. This will funnel the powder so it does not spill.

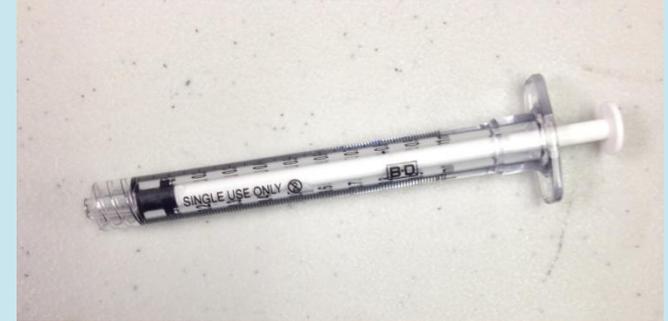


Cut the bottom half of your bottle off to create the funnel.



Pour one even teaspoon through the funnel into your bottle.

# The Final Steps!



Dump a little of the solution into a smaller cup to access it with the syringe.

Use the syringe to drop 1 cc of the solution into your filtered water, and similar to using household bleach, you now have fresh, chlorinated clean water.

Now that the Calcium Hypochlorite is sitting in the bottom, fill the two liter full of clean, filtered water. SHAKE IT THOROUGHLY UNTIL THE GRANULES HAVE COMPLETELY DISINTEGRATED.

This may take a few minutes.

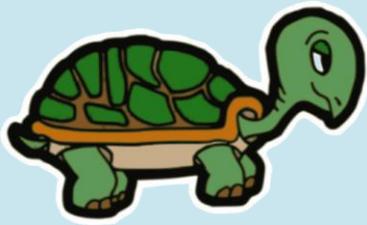
## Additional Instructions for Calcium Hypochlorite:

- Use the sniff test after chlorinating. There should be a faint odor of bleach in your water. If you cannot smell anything, you can add a drop or two of the calcium hypochlorite solution.
- The solution will degrade over time, so it is best to just make one two-liter batch of the solution at a time.
- Wear gloves to handle the calcium hypochlorite. It is a dangerous chemical to ingest and should be kept in a safe place out of reach of children.
- Use the test strips to make sure there is 1-2 ppm of free chlorine in your 5 gallon bucket.

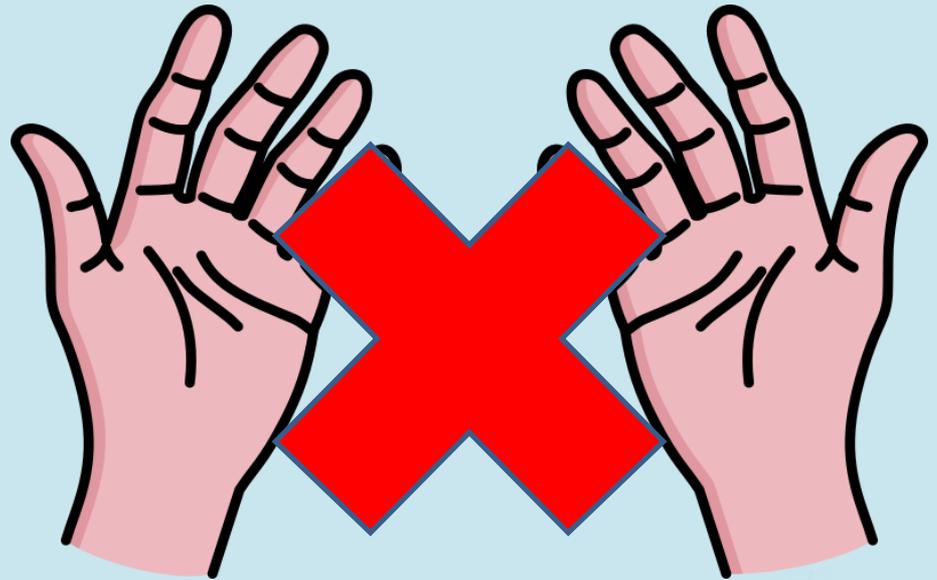


That's it!

Stir the water with your agitator stick, let it sit for 30 minutes, and then enjoy your clean water!



Umm hey guys, Dopey here. I think that's my name? Anyway, once you have clean water, you want to keep it clean. So don't touch it with your flippers...I mean, um, hands.



Once you have filtered and chlorinated your water supply, your clean water should not be touched by human hands, utensils, cups or glasses.

These are all contaminants.

\*\*If you do not have access to dip strips, do the "sniff test". Make sure there is a faint odor of chlorine in your bucket.





**ALL CLEAN  
WATER SHOULD  
COME ONLY  
FROM YOUR  
SPOUT!**



**Junior Turtle approves  
of drinking from the  
spout.**



**Congratulations!**  
**You are now**  
**ready to enjoy**  
**filtered,**  
**chlorinated, and**  
**most importantly,**  
**SAFE**  
**drinking water**  
**for yourself and**  
**your family.**



# An Invitation to Contribute:

To purchase the supplies needed for a household to have the ability to continuously provide themselves with clean, drinkable water, the cost is approximately 30 dollars. This pays for two five-gallon buckets and the Sawyer water filtration kit.

As hundreds or thousands of water buckets may be needed to fulfill the need of a single community, it is much more cost-effective to buy the supplies in bulk. If you are an international nonprofit, please ask us about purchasing the buckets in large quantity, as a significant discount can be applied.

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**DISCLAIMER: NO TURTLES  
WERE HARMED IN THE MAKING  
OF THIS POWERPOINT.**