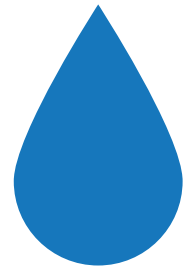


4

WATER PLAN



ACTIVITY 14: LEARN HOW TO STORE WATER



Goal: Learn how much water you'll need and how to store it.

STEP 1: DETERMINE HOW MUCH WATER YOU'LL NEED

How much water you need to *Be 2 Weeks Ready* depends on several factors. Each person will need roughly 1 gallon of water each day for drinking, meal preparation and cleanup, and personal hygiene. Each pet also needs roughly one gallon per day. Individual needs vary by age, activity level, health, diet and climate. The amount of water you'll need will also be impacted by the kinds of foods you plan to eat (pasta, oatmeal, baby formula, powdered milk, etc.) for two weeks without indoor running water. A medical emergency may also require additional water.



1 gallon of water per day, per person, assumes about 1/2 gallon for drinking and 1/4 gallon each for cooking and hygiene.

One gallon per pet, per day. This is a conservative amount that will need to be used wisely. It may seem like a lot, but you need to use this precious resource sparingly during disasters. For perspective, consider that on average during normal times, each person uses about 80-100 gallons of water per day for indoor home uses. Flushing the toilet uses the most water, followed by bathing and showering.

WATER FOR LIVESTOCK

Livestock and other farm animals can also be negatively impacted during disasters. Reductions in water supplies can result in poor livestock performance and condition, as well as range damage caused by both overuse and underuse. Locating additional sources of stock water becomes critical to avoid damage to both animals and range resources.

Even if storage space is limited, storing water for at least three days is critical. You should work toward storing 14 days' worth of water per person and animal.



Farmers and ranchers are impacted by many variables that affect available water supplies. The Oregon State University and Washington State University Extension Services and local farm service agencies provide regular guidance, tools and resources to farmers and ranchers on a host of topics, including water supply during times of water shortage. Find the OSU Extension Service office in your Oregon community by visiting <https://extension.oregonstate.edu/>. Find the WSU Extension Service office in your Washington community at <https://extension.wsu.edu>.

CHECK YOUR WATER CONSUMPTION PRACTICE TIP

This is a great time to refer to your journal from Activity 1 to see how much water you and those in your household (including pets) consumed over two weeks. Consider practicing using only stored jugs of water for a few days to see how much water is used.

CONVERSION TIP

If you don't have access to large water containers (that typically hold 7 gallons) you may consider using 2-liter soft drink bottles. These are equivalent to about ½ gallon capacity each and are a cost-effective way to store water if you're on a budget. They are readily available, sturdy and small enough to be tucked away almost anywhere, even if you live in a small space. Try to rotate your water stash every six months. Water that's stored longer will not be as fresh but can always be treated.

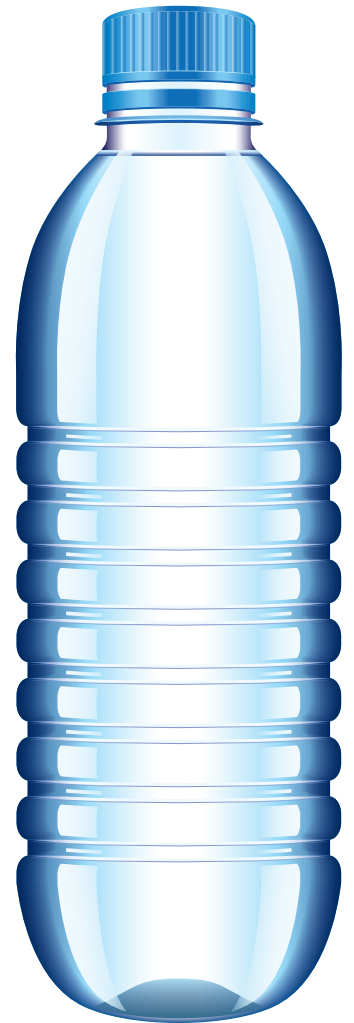
A WORD OF CAUTION

While they are fluids, soft drinks, caffeinated beverages like coffee and tea, and alcohol should not be substituted for water in your calculation of water needs. These fluids will dehydrate the body and increase the need for more drinking water.

STEP 2: SANITIZE WATER CONTAINERS

All containers used for storing water must be sanitized before adding potable water.

- Wash containers and lids inside and out with dish soap to remove any dirt and debris.
- Rinse thoroughly with clean water.
- Add 1 teaspoon of unscented, household liquid chlorine bleach to 1 quart of water (1 quart = 4 cups or 32 ounces or 1 liter).
- Pour the bleach mixture into a clean storage container. Close it tightly and shake it well to make sure the solution coats the entire inside of the container.
- Let the container sit for at least 30 seconds, then pour out the solution.
- Let the container air dry or rinse it with clean, purified water.
- Fill it to the top with clean water and seal it tightly. Be careful not to contaminate the cap by touching the inside of it with your fingers.
- Label it with the words "Drinking Water" and the date it was stored.
- Rotate water every six months to keep it fresh.
- Use water that's rotated out to water plants, rather than dumping it down the drain.



TREATING WATER TO MAKE IT SAFE

Water from municipal water sources is already treated to be safe, so no additional treatment is necessary. Fill the clean, sanitized food-grade container with tap water, close it securely and label it with the words “Drinking Water” and the date.

Water from a well or spring, which is known to be pathogen-free but not chemically treated, should be purified by boiling or by adding unscented, household liquid chlorine bleach (see Step 2: Sanitize Water Containers).

STEP 3: PREPARE WATER FOR STORAGE

- Boiling is the safest method of treating water. Bring the water to a full, rolling boil for a minimum of one minute or three minutes for elevations above 6,500 feet. Let cool.
- To purify, use a medicine dropper to add unscented, household liquid chlorine bleach. Use new chlorine bleach, because it loses its strength over time.

Bleach Amounts

- Two drops of 5 to 6% sodium hypochlorite bleach per 1 quart of water.
- Eight drops or 1/8 teaspoon of concentrated 8.25% sodium hypochlorite bleach per 1 gallon of water.
- Put the lid on and shake the mixture well. After adding bleach, you must let it stand for at least 30 minutes before using it.
- Store the purified water in clean, sanitized containers with tight lids.



STEP 4: LABEL IT AND DATE IT

- Once your containers are filled with clean, sanitized water and are tightly sealed, label them with the words “Drinking Water” and the date.
- If you use larger containers for long-term water storage, be sure to use the proper bleach ratios to ensure the water is sanitized. Check OSU Extension’s guidance for bleach ratios to be used for large containers of 5 gallons and greater.
- People can mark or decorate water containers designated for them. This can be a fun activity for kids!

STEP 5: STORE IT

Carefully storing your water supply is important. Water is very heavy (over 8 pounds per gallon), and the people you live with may struggle to safely carry it, lift it and pull it from overhead storage areas. Consider if it will be too heavy to transport if you must evacuate.

Storing the water needed for two weeks may be unfeasible, particularly for those with limited storage space or for those on a limited budget. It’s important to store what you can and learn how to “find” water in and around your place and “make” water that’s safe to use when regular water supplies may be temporarily unavailable.

CREATIVE PLACES TO STORE WATER

- Under beds and sinks
- In cabinets and in closets (beneath clothing, on shelves)
- In garages and storage sheds
- In boxes that can be stacked and covered with a cloth and used as a table or TV stand
- Under car seats

STORING CONDITIONS

- Store water where everyone in the household can access it.
- Store water in a dark, dry, consistently cool space that stays at a relatively constant temperature (50-70°F or 10-21°C).
- Do not store water in direct sunlight.
- Do not store water near chemicals, fuel, pesticides, herbicides or products with strong odors that can be absorbed by the storage container and transferred to the water.
- If possible, store parts of your water supply throughout your living space. If a disaster damages part of your living space, you can still access other parts of your supply.

TIP: Store some water in a freezer, which is most efficient when it's full. Fill empty spaces with food-grade plastic or metal containers of water. Let the water freeze, then cap the container. Doing this:

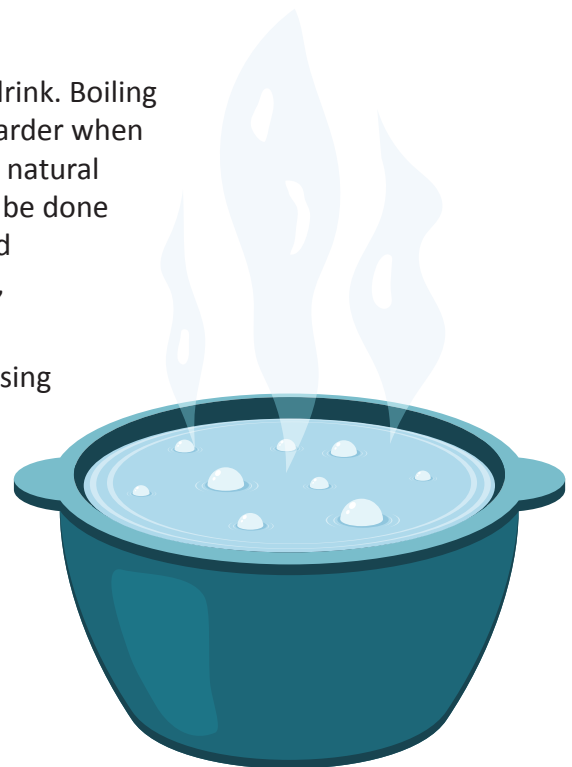
- Increases the freezer's efficiency.
- Creates jugs of ice that can be used in a cooler when transporting food or camping.
- Helps keep the freezer cold as long as possible in the event of the loss of power.
- Provides safe drinking water as it melts.

ACTIVITY 15: LEARN HOW TO BOIL WATER BY USING COMMON METHODS



Boiling water is a highly effective way to make it safe to drink. Boiling water may seem like a basic task, but it could be much harder when a disaster occurs and you're without indoor electricity or natural gas. Boiling water requires very little equipment and can be done rather quickly. After a disaster, all water for drinking, food preparation and hygiene must be boiled if it's not sealed, store-bought or already pre-treated.

This activity will help you practice how to boil water by using common methods, such as using a camp stove, BBQ grill, propane-fired outdoor gas grill or campfire. Boiling water means heat will be involved, so extra caution should be given to handling hot cookware and being near an open fire. Use kitchen hot pads, a thermal oven mitt or layered towels for handling hot cookware.



STEP 1: GATHER NECESSARY MATERIALS

This activity uses already sanitized storage containers. (See Activity 14 for how to sanitize containers.)

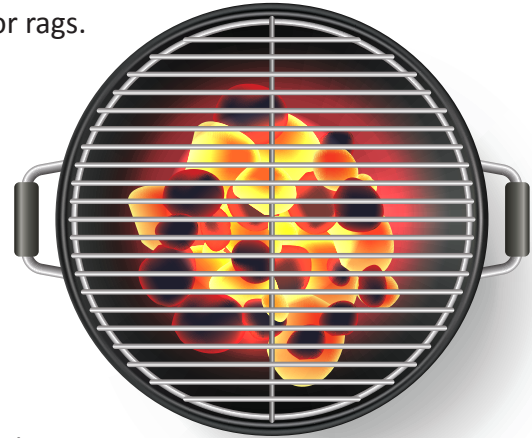
You'll need:

- A cooking source (camp stove, BBQ grill, propane gas grill, chiminea or campfire pit).
- A medium or large-sized pot that can be placed directly on a heat source.
- A cooking grill grate for cooking on open fires.
- Fuel (wood, propane, charcoal briquettes, lighter, matches).
- Kitchen hot pads, thermal oven mitts, kitchen towels or rags.

STEP 2: SET-UP AND ACTIVATE HEAT SOURCE

Important safety steps regarding open fires:

- Only build open fires outdoors and away from structures, trees, dry grass and shrubbery.
- Avoid open fires (such as a fire pit) if it's dry, hot or windy.
- Use rocks to build a fire ring to contain open fires.
- Stack available wood, first using tiny pieces (kindling), then adding larger pieces.
- Ignite the kindling to start the fire.
- If you don't have a grill grate, use a flat rock set on the edge of the fire ring and place your pot on top.
- Avoid set-up in areas where there is heavy foot traffic and especially where children play.



Important safety steps regarding camp stoves, BBQ grills and propane grills:

- Always ensure your equipment is away from structures, trees, dry grass and shrubbery.
- Ensure all connections are secure for propane-fueled stoves and grills.
- Ensure BBQ and hibachi grills are on level ground and away from heavy foot traffic and especially areas where children play.

TRACKING TIME WITHOUT A CLOCK OR WATCH

Assuming you don't have a working clock or watch, here are some easy ways to keep track of time for boiling water for one minute.

- Sing "Happy Birthday" at a normal pace six times.
- Count aloud "one Mississippi, two Mississippi," etc., with each "number Mississippi" being roughly equivalent to one second. You'll need to "count Mississippi" 60 times to equal one minute.
- Use a kitchen wind-up timer if you have one.

STEP 3: BRING AND KEEP WATER BOILING

- Place the pot of water over the heat source.
- Use kitchen hot pads, a thermal oven mitt, kitchen towels or rags to touch handles.
- Bring the water to a rolling boil for at least one minute; for elevations above 6,500 feet, boil for at least three minutes.

TIP: If you're unsure of your elevation, there's no danger in boiling for longer than three minutes. When in doubt, wait it out.

STEP 4: COOL AND STORE PURIFIED WATER

- Carefully remove the pot from the heat and terminate the heat source.
- Place the pot of water on a steady surface and allow it to cool completely before it can be stored. (See Activity 14 for storing water.)
- Distribute purified water into sanitized storage containers. Because boiling removes oxygen from water, it can taste flat. Pour it back and forth between two sanitized containers to replace oxygen before sealing.

ACTIVITY 16: FINDING OTHER WATER SOURCES (AFTER DISASTER STRIKES)



If the water you've sanitized and stored is not enough, you may need to find alternate water sources that are safe to drink. Fortunately, there are several sources you can use in and around your place, assuming you can access them.

Emergency Inside Water Sources

If authorities warn that public water is unsafe, or if there are signs of broken water lines, shut off the water lines entering your place. This prevents unclean water from entering your water system and contaminating the usable water.

- Plug your bathtub and sink drains and fill them with water if you can. (This water will need to be sanitized to ensure safe use. See Activity 14.)
- Water from the toilet tank (not the bowl) is usable after purification IF a chemical hasn't been used to keep the bowl clean, such as those that turn the water blue.
- Melt ice cubes in trays and freezer-stored jugs of water.
- Liquid from canned fruit and vegetables can be consumed; liquid in cans of vegetables may be salty, however.
- Pipes and water heaters hold water. Use every drop at each faucet wisely. Water drains downward, so obtain that last drop from the lowest faucet.



GETTING WATER FROM PIPES

Step 1: Turn off your water supply at the street to keep sewage from backing up into your water system. Before accessing any water from your pipes, make sure your water source hasn't been contaminated. Then, locate and shut off your main water valve. In a single-family home, this valve is typically located in the basement, garage or crawl space.

Step 2: Let air into your plumbing system by locating and turning on a faucet located at the highest point in your place. If you live in a one-story home, the highest faucet may be your shower head.

Step 3: Use a faucet located at the lowest point in your place as your water source, shutting it on and off as needed. If you live in a one-story home, the lowest faucet may be a hose spigot or your water heater.

- If you live in an apartment or condo, your water valve may be centrally located and not in your living space. The amount of available water will depend on your apartment's location in the building and how many other people are pulling water from the building's pipes.

Water from the water heater tank is also usable in a disaster (see Activity 17). This refers to the tank that connects to the water that comes out of your faucets and showerheads. ***IMPORTANT NOTE:** This is different from the tank used to supply hot water to radiators in older homes. In these situations, use the tap water heater tank, not the home heating system tank.

ACTIVITY 17: LEARN HOW TO REMOVE WATER FROM A WATER HEATER TANK

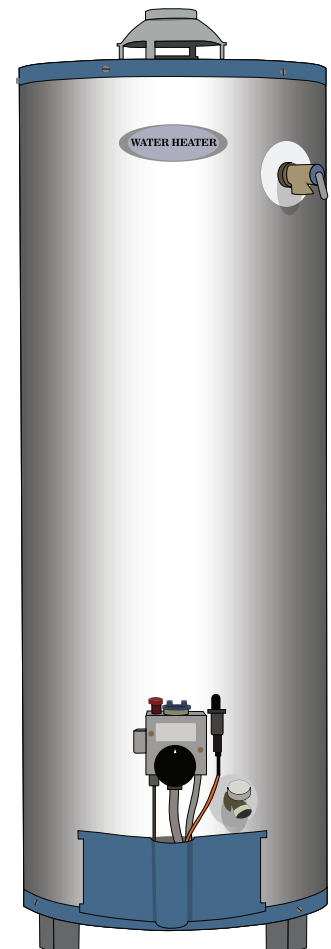


Water can be removed from a water heater tank if you have safe access to it. Water heaters typically range in size and can hold 30 to 80 gallons of water for drinking, cooking and hygiene. Removing the water is not difficult **but requires great care and is best done by practicing in advance** to be sure you do it safely. Watch this how-to video <https://youtu.be/VlpOc3bmZ1E?si=MnerepR49sTyS6jd> from the Regional Water Providers Consortium (<https://www.regionalh2o.org>) based in Portland. This resource also offers downloadable instructions that can be hung from your water heater for quick reference. The following information is excerpted from this source.

STEP 1: GATHER SUPPLIES

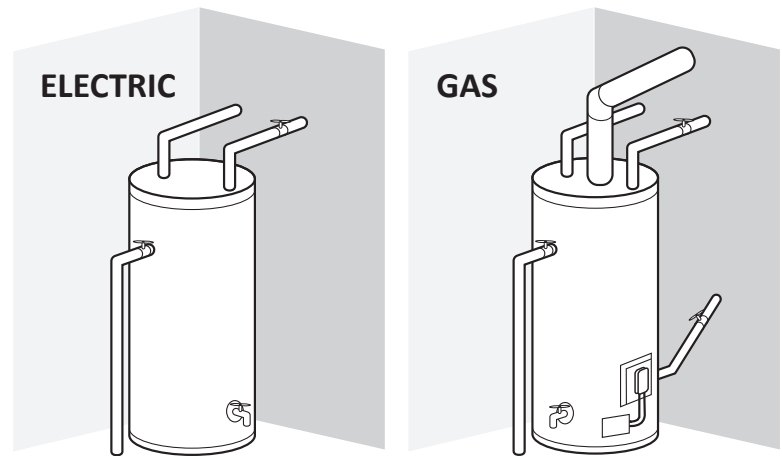
Gather this list of supplies to safely remove water from your water heater tank. Have them readily accessible to your water heater during an emergency.

- Flashlight
- Screwdriver
- Towel or rag
- Thermal gloves (like an oven mitt)
- Safety glasses
- Coffee filters
- Sanitized container (a large bucket is best)



STEP 2: LOCATE THE WATER HEATER

Water heaters are usually located in a basement or garage in free-standing homes and in closets of apartments and manufactured homes or trailers.



STEP 3: TURN OFF THE WATER SUPPLY TO YOUR PLACE

Emergency water shut-off valves are usually found in the basement, crawl space, garage or outside by the home's foundation. Use this valve to turn off your water supply. Taking this step, especially after an earthquake, could help to ensure the water remains in your tank and that its quality is not compromised and unsafe to use.

STEP 4: TURN OFF THE WATER HEATER'S POWER SOURCE

This step is crucial to ensure your safety.

For electric water heaters: Shut off the water heater's power by flipping the correct switch on your electrical panel. Take time to correctly identify the right circuit breaker beforehand. If it's not yet labeled, do that now.

For natural gas water heaters: Locate the on/off switch on the water heater and turn the knob to the pilot setting. Do not turn it completely off.

STEP 5: TURN OFF THE WATER SUPPLY TO THE WATER HEATER

Locate the water shut-off valve on the water heater and turn it clockwise until it stops. This valve is typically located on the top of the water heater.

STEP 6: LET AIR INTO THE WATER HEATER

Open the relief valve, which is located on the side of the tank. You can do this by flipping the handle so that it sticks straight up or out or by turning on hot water spigots in the main living area or upstairs in your home. This will help release water from the water heater.

STEP 7: LOCATE THE DRAIN VALVE AND RELEASE WATER

Locate the drain valve at the bottom of the water heater and release water from the tank, as needed. Place a clean container under the drain valve spigot to capture the water and turn the spigot or screw of your water heater's drain valve to the left. **Be careful: The water may be very hot!** Wearing gloves or an oven mitt and safety glasses are recommended. Turn the spigot or screw to the right to stop the flow of water. Repeat this process as often as needed until the tank is empty.

WORD OF CAUTION

The CDC advises to **NOT DRINK** water that has an unusual odor or color or that you suspect might be contaminated with fuel or toxic chemicals. This water cannot be made safe, so you must find a different source of water for your needs.

There may be some sediment that escapes with the water when you begin draining. Wait for the water to clear, then change to a new container. Filter the sediment out of the first container with a coffee filter. **You will need to treat or filter any water used for drinking, food preparation and hygiene.**

WATER HEATER MAINTENANCE TIPS

Water heater maintenance plays a critical role in the availability and quality of water contained in your water heater.

- Properly brace your heater to the wall so that it is more likely to remain connected to the wall and your water system.
- Flush your water heater annually. Doing this can significantly decrease the amount of sediment build up, and may improve the quality of the water in your water heater.

ACTIVITY 18: LEARN HOW TO DISTILL WATER



STEP 1: GATHER A POT, LID AND BOWL

Fill a pot halfway with water. Place a heat-resistant bowl on top of the water. Put the pot's lid upside down on top of the pot. Putting the lid upside down allows for the water to drip directly into the bowl.

STEP 2: BOIL

Boil the water for 20 minutes. The water that drips from the lid into the bowl is distilled.

STEP 3: SAFELY STORE

Like other clean water, distilled water should be safely stored (see Activity 14).



FOR ADDITIONAL RESOURCES ON THIS UNIT, VISIT OEM'S BE 2 WEEKS READY WEBPAGE AT
www.oregon.gov/oem/be2weeksready



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