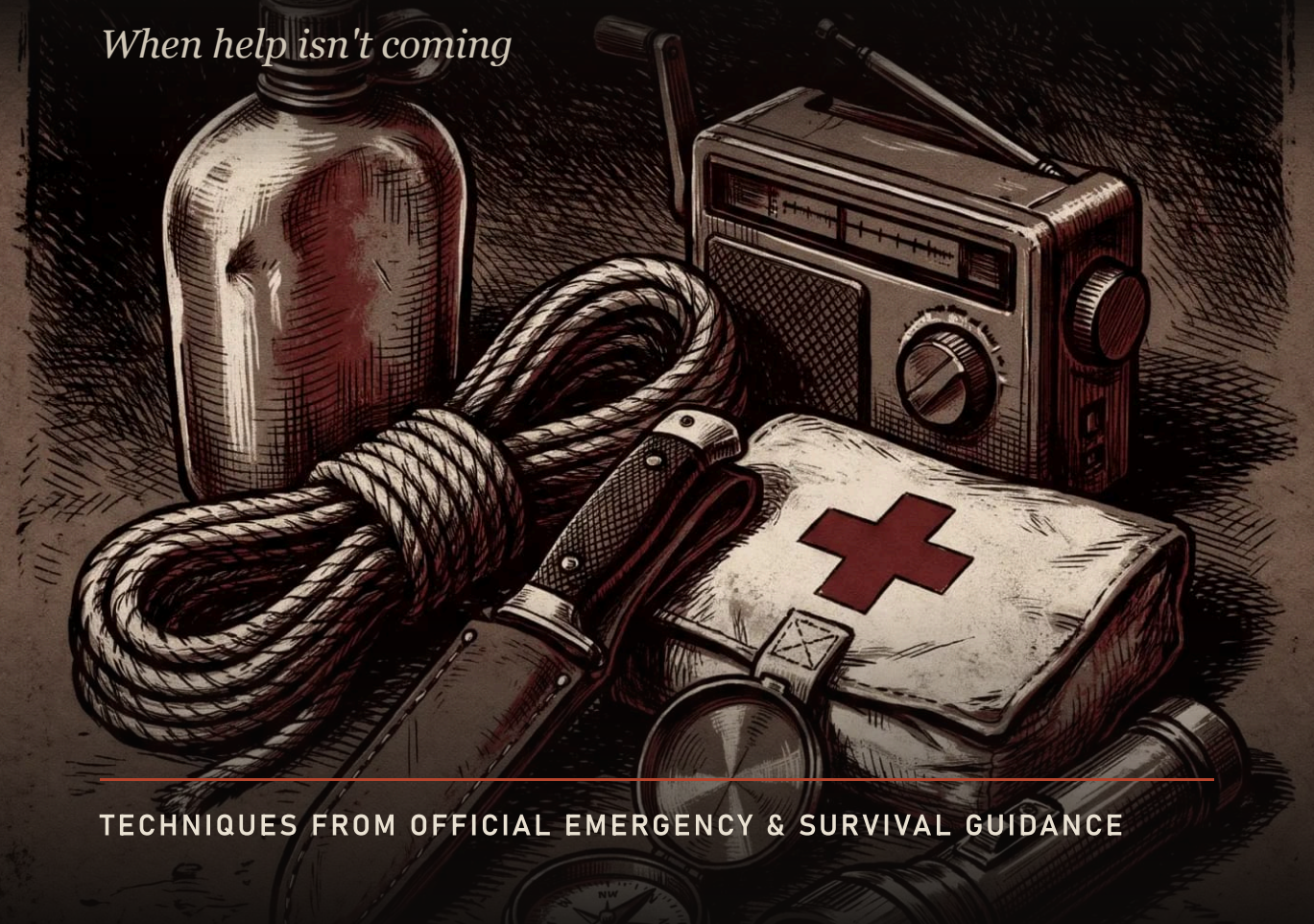
FIELD MANUAL · BOOK 1

DIY SURVIVAL

CORE SKILLS

WATER · FOOD · SHELTER · FIRST AID

When help isn't coming



TECHNIQUES FROM OFFICIAL EMERGENCY & SURVIVAL GUIDANCE

DIY SURVIVAL

CORE SKILLS

Water, Food, Shelter and First Aid When Help Isn't Coming

SAFETY NOTICE

This book is for preparing ahead and for times when official help is unavailable. Always follow instructions from your local emergency authorities first. They know conditions where you are; this book does not. Nothing here replaces professional medical care. Get it as soon as you can.

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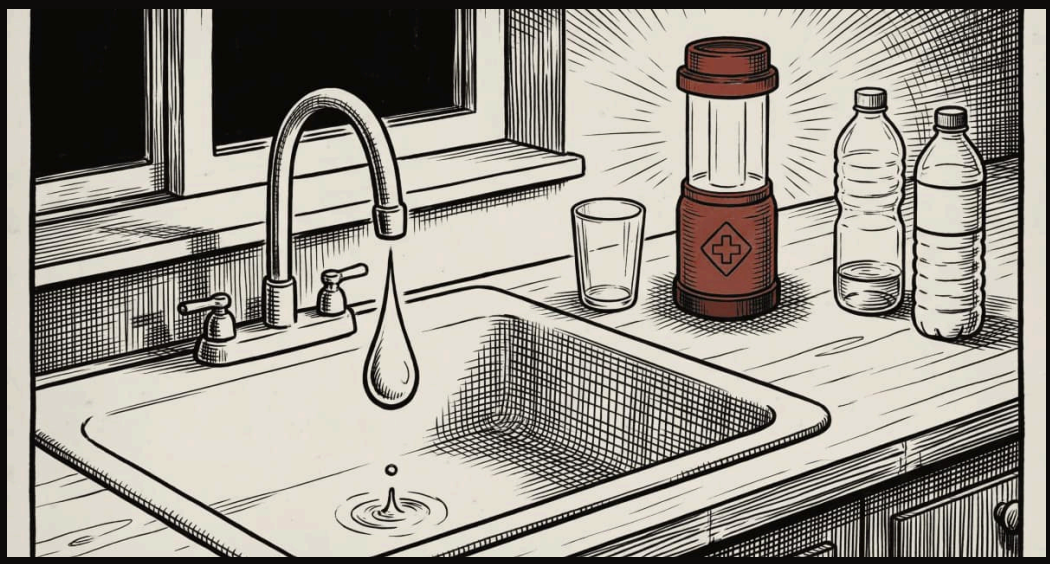
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CHAPTER 01 · CORE SKILLS

01

WATER

DAY TWO OF A POWER CUT. THE TAP IS DRY.



THE SITUATION

On the second night of a power cut, you turn the kitchen tap. It coughs, spits a little air and goes quiet. Many water systems rely on electric pumps, so a power cut can quickly become a water cut.

Two bottles stand on the counter, one half empty. That isn't even a day's water for a family.

There's a rain barrel in the garden and a full hot water tank in the cupboard. Is either safe to drink? How long do you boil water for? You can't look it up: your phone is on nine per cent and the page won't load.

WHAT CAN GO WRONG

- **Not enough stored.** A family of four needs about **15 litres (4 gallons) a day**.
- **A power cut became a water cut.** Many water systems rely on electric pumps.
- **Not knowing** where the water already in the house is, or how to make other water safe, with no way to look it up.

IN SHORT

Store **4 litres (1 gallon) per person per day**, for two weeks. Know where the hidden water in your home is. Know how to **boil** or **bleach** any water you're not sure of. Write it down now, because you may not be able to search for it later.

IN A HURRY?

- Unsure if water is safe? **Rolling boil for 1 minute** (3 minutes above 2,000 m / 6,500 ft).
- Can't boil? **Plain, unscented bleach**: 2 drops per litre, wait 30 minutes (Figure 1.5).
- Taps about to fail? **Fill bottles and pans now**, and the bath for washing and flushing.
- Smells of **fuel or chemicals**? Don't drink it. Boiling won't fix it.

HOW MUCH WATER YOU NEED

The problem: You can live for weeks without food but only a few days without water. Most homes have a day or two of drinks in them at most.

In short: Store **4 litres (1 gallon) per person per day**: half for drinking, half for cooking and washing. Aim for **two weeks** at home.

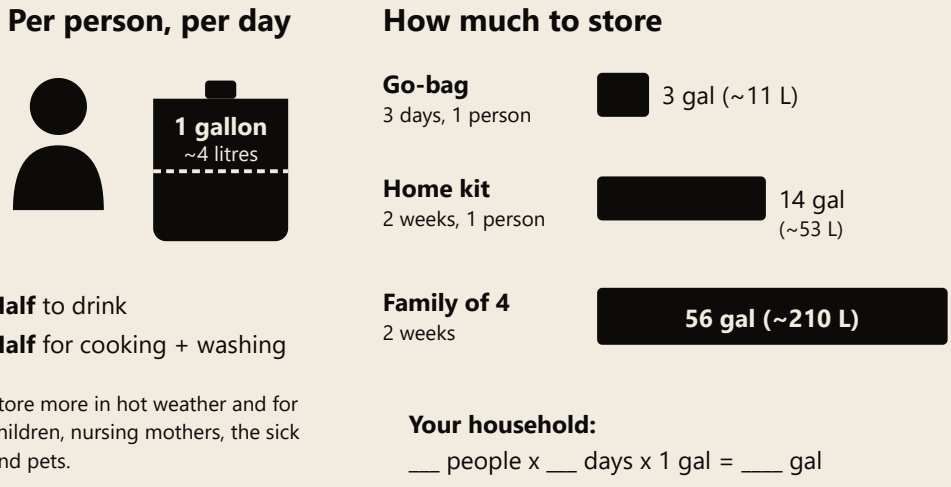


Figure 1.1. How much water to store: 4 litres (1 gallon) per person, per day.

Solutions:

1. **Do the maths for your household:** people × days × 4 litres. A family of four needs **about 210 litres (56 gallons)** for two weeks. That's roughly twenty-one 10-litre containers, which fit under a bed and in a cupboard.
2. **Store more** for hot weather, nursing mothers, children, anyone ill, and pets. A medium-sized dog drinks about a litre a day.
3. **Buy sealed bottled water** and keep it until its use-by date, *or* fill your own **food-grade** containers from the tap and replace the water **every six months**.
4. **Store it cool and dark**, off concrete floors, away from fuel, paint and chemicals.

> **How aid agencies plan.** In long emergencies, humanitarian standards plan for at least **15 litres per person per day** for drinking, cooking and basic hygiene [12]. Your stored 4 litres a day is a minimum for survival at home, not a comfortable amount. Plan extra for washing if you can.

WATER ALREADY IN YOUR HOME

The problem: The taps have stopped and your stored water is running low.

In short: A typical home holds **well over 100 litres** of usable water. Find it before you need it.

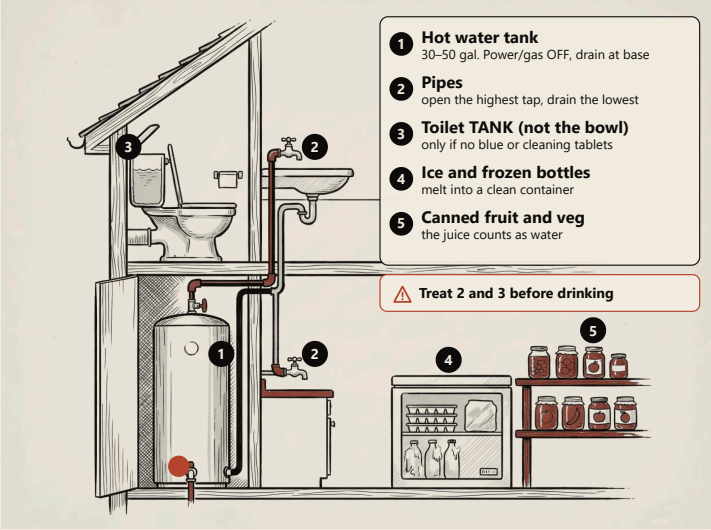


Figure 1.2. Hidden water in a typical home.

Solutions:

1. **Hot water tank** (often 110–190 litres / 30–50 gallons). Turn off the power or gas to the heater first. Open a hot tap upstairs to let air in, then drain from the valve at the bottom into clean containers. The first water out may be cloudy, so let it settle.
2. **Pipes.** Open the **highest** tap in the house to let air in, then collect from the **lowest** tap.
3. **Toilet tank (cistern), never the bowl,** and only if you don't use blue or cleaning tablets in it. Always treat this water before drinking.
4. **Ice and frozen bottles.** Let them melt into a clean container.
5. **Canned fruit and vegetables.** Drink the juice.

> **If you're warned that the mains water may be contaminated, turn off the water at your home's main stop tap (valve)** so dirty water can't get into your pipes and tank. Find your stop tap now: it's usually under the kitchen sink or where the pipe enters the house.

FINDING MORE WATER: THE OPTIONS LADDER

The problem: Your stored water and the water in the house have run out, the taps are still dry, and no water station has opened.

In short: Work down the ladder. Collect the cleanest water you can, and **always treat it** (next section) before drinking [21].

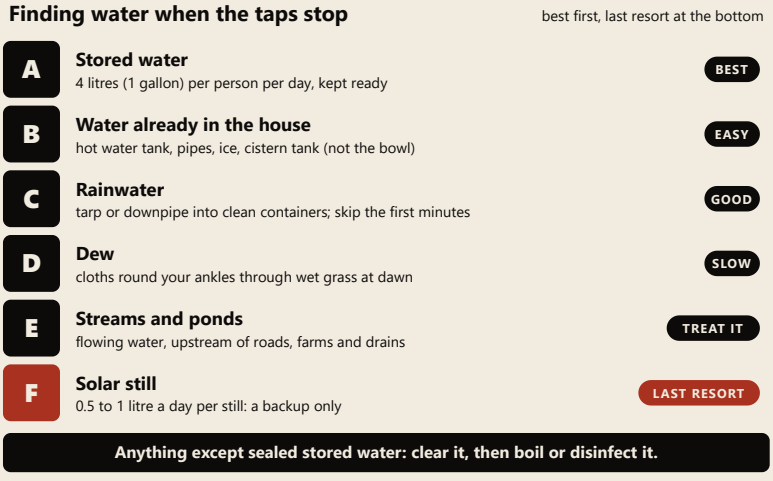


Figure 1.3. Where to find water when the taps stop, from best to last resort.

01

Rainwater

Rain collected straight into clean containers is the cleanest outdoor water [21]. Run a tarp or plastic sheet into a bucket, or put a clean container under a downpipe. **Let the first few minutes of rain wash the roof before you collect**, cover the containers, and still treat the water: roofs carry bird droppings and dirt.

Dew

Before sunrise, tie clean cloths or towels around your ankles and walk through long, wet grass, then wring them into a container. The Army manual reports people collecting up to a litre an hour this way [21].

Streams, rivers and ponds

Choose **flowing water**, collect upstream of roads, farms, drains and settlements, and avoid water with an oily sheen, a chemical smell or dead fish. If water is muddy, **let it stand for up to 12 hours** so the dirt settles, then pour off the clear water and treat it [21].

Solar still (last resort)

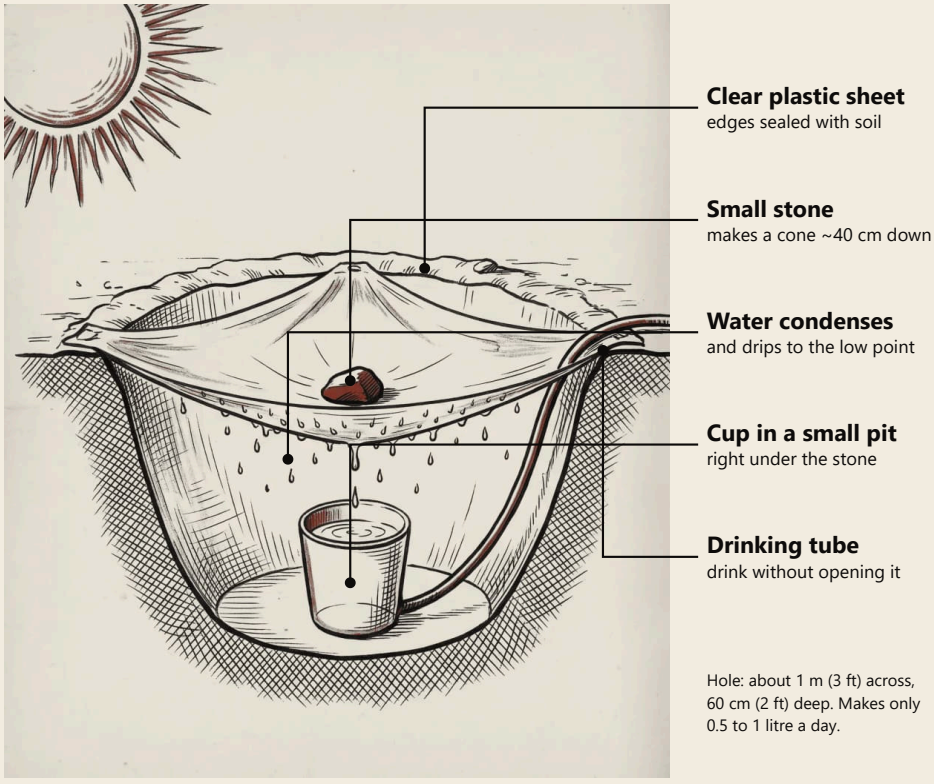


Figure 1.4. A below-ground solar still in cross-section.

A still draws moisture from damp ground and plants using the sun [21]:

1. In a sunny spot with damp soil (a dry stream bed or a hollow), dig a bowl-shaped hole about **1 m (3 ft) across and 60 cm (2 ft) deep**, with a small pit in the middle.
2. Stand a cup or tin in the pit. Run a length of tubing from it up over the rim if you have one.
3. Lay **green, non-poisonous leaves** in the hole around the cup if you can.
4. Cover the hole with **clear plastic sheet**, seal its edges all round with soil, and put a small stone in the middle so the plastic sags into a cone **about 40 cm below ground**, directly above the cup, not touching the soil.
5. Water condenses on the plastic, runs to the low point and drips into the cup. Drink through the tube without opening it.

> **Reality check:** one still makes only about **0.5–1 litre a day**, so you'd need at least three to supply one person [21]. Digging makes you sweat, so build it in the cool of the day. It's a backup, not a water supply.

MAKING WATER SAFE

The problem: Water from rain barrels, streams or damaged mains can carry germs that cause severe diarrhoea. Without medical help, that can be dangerous, especially for children and older people.

In short: Clear it, then kill the germs. Boiling is best. Bleach is the backup.

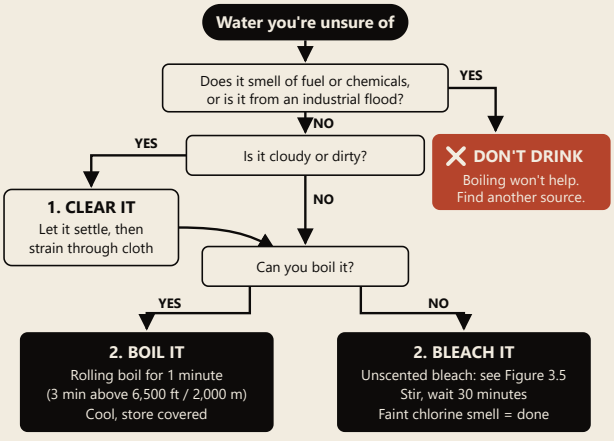


Figure 1.5. Making water safe: a quick decision guide.

01

Boil it (best)

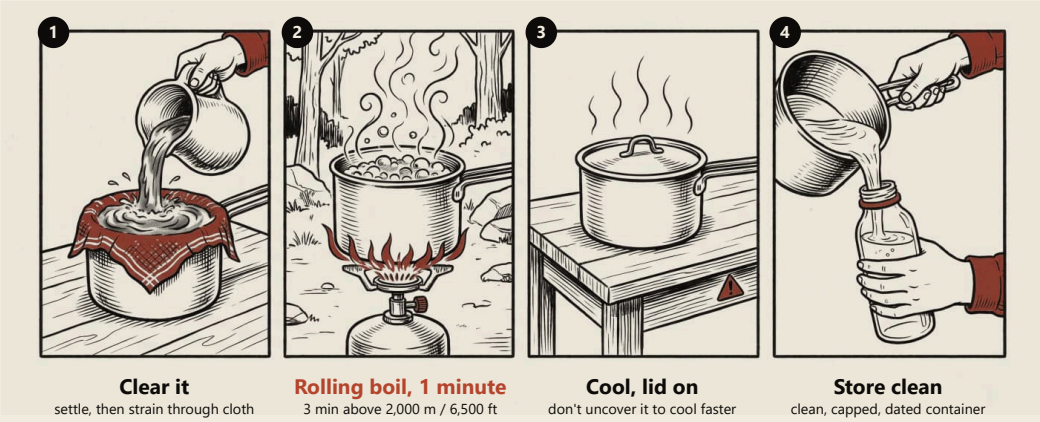


Figure 1.6. Boiling water safe in four steps.

If the water is cloudy, let it **stand** until the dirt settles, then pour the clear part through a clean cloth or coffee filter. Germs hide in the dirt, so this makes boiling and bleach work better.

Then bring it to a **rolling boil**, with big bubbles all over the surface, for **1 minute** (3 minutes above 2,000 m / 6,500 ft). Let it cool with the lid on, and store it in a clean, capped container. Boiled water tastes flat; pouring it between two clean jugs a few times brings the taste back.

Or bleach it

Use plain household bleach that lists **sodium hypochlorite** on the label. **Don't** use scented, colour-safe or "thick" bleach, or bleach with added cleaners.

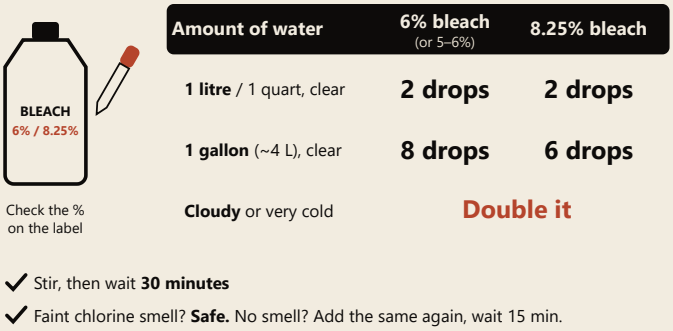


Figure 1.7. How many drops of bleach to add. Check the percentage on your bottle.

- Stir, then **wait 30 minutes**.

- It should smell **faintly of chlorine**. If not, add the same dose again and wait another 15 minutes.
- Keep a clean **medicine dropper** taped to your bleach bottle, used for nothing else.

Or use tablets or iodine

- **Water purification tablets:** follow the packet instructions exactly, including the waiting time [9].
- **Iodine:** add **5 drops of 2% tincture of iodine per litre** of clear water, or **10 drops if it's cloudy or very cold**, and wait **30 minutes** before drinking [21]. Iodine isn't suitable for pregnant women or people with thyroid problems, or for use for more than a few weeks [39].

Or use sunlight (SODIS)

If you can't boil or bleach, **sunlight can disinfect clear water** [13]. The sun's ultraviolet rays and heat kill most germs.



Figure 1.8. Solar water disinfection (SODIS) in four steps.

1. Use **clear plastic (PET) bottles of 2 litres or less**, without labels and not badly scratched.
2. Use **clear water**: settle and strain cloudy water first.
3. Fill, cap, and lay the bottles **on their side in full sun**, ideally on a dark or metal surface.
4. Leave them for at least **6 hours in sun**, or **2 full days if it's cloudy**. It doesn't work in continuous rain.

SODIS doesn't remove chemicals, and it isn't as reliable as boiling. Use it when you have no other option.

01

Or filter it

Portable filters remove bacteria and parasites, but most **don't remove viruses**. Unless your filter is certified for viruses, boil or bleach the filtered water too.

> HAZARD: Water that may contain **fuel, chemicals or industrial floodwater** can't be made safe by boiling, bleach or a simple filter. Find another source.

MAKE IT: A BOTTLE SAND-AND-CHARCOAL FILTER

When you have no filter to buy, this traditional filter clears muddy water using things you can find. **It makes water clearer, not safe.** Always boil or disinfect the water afterwards [21].

Materials: a large clear plastic bottle, a knife, two pieces of clean cotton cloth, **charcoal from a wood fire** (not barbecue briquettes, which contain additives), clean fine sand, small gravel, and a clean jar.

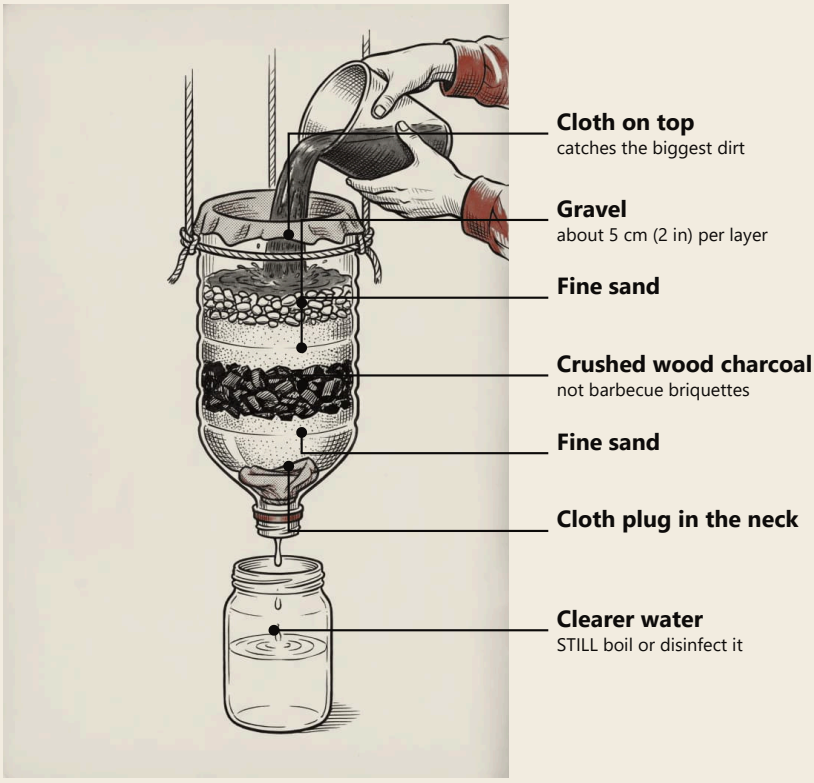


Figure 1.9. A bottle sand-and-charcoal filter.

1. **Cut the base off** the bottle and turn it upside down over the jar (neck down).
2. **Plug the neck** with a piece of cloth.
3. **Add layers**, from the neck upwards: about 5 cm (2 in) of **fine sand**, 5 cm of **crushed charcoal**, another 5 cm of **fine sand**, then 5 cm of **gravel** [21].
4. **Lay a cloth on top** to catch the biggest dirt when you pour.
5. **Rinse it through** with a few pours of water and throw that water away.
6. **Pour water in slowly**, collect what drips out, then **boil or disinfect it**.

Charcoal also removes bad smells: the Army manual suggests leaving charcoal in smelly water for 45 minutes [21]. Replace the sand and charcoal when water starts coming through dirty.

MAKE IT: A TWO-BUCKET GRAVITY FILTER

This filter turns a rain barrel into a steady supply of clearer, safer water, with no power and no pumping.

Materials: two food-grade buckets with lids (20 litres / 5 gallons), one or two **certified** ceramic or hollow-fibre filter candles made for buckets, a small plastic tap (spigot), a drill and step bit, a marker pen.

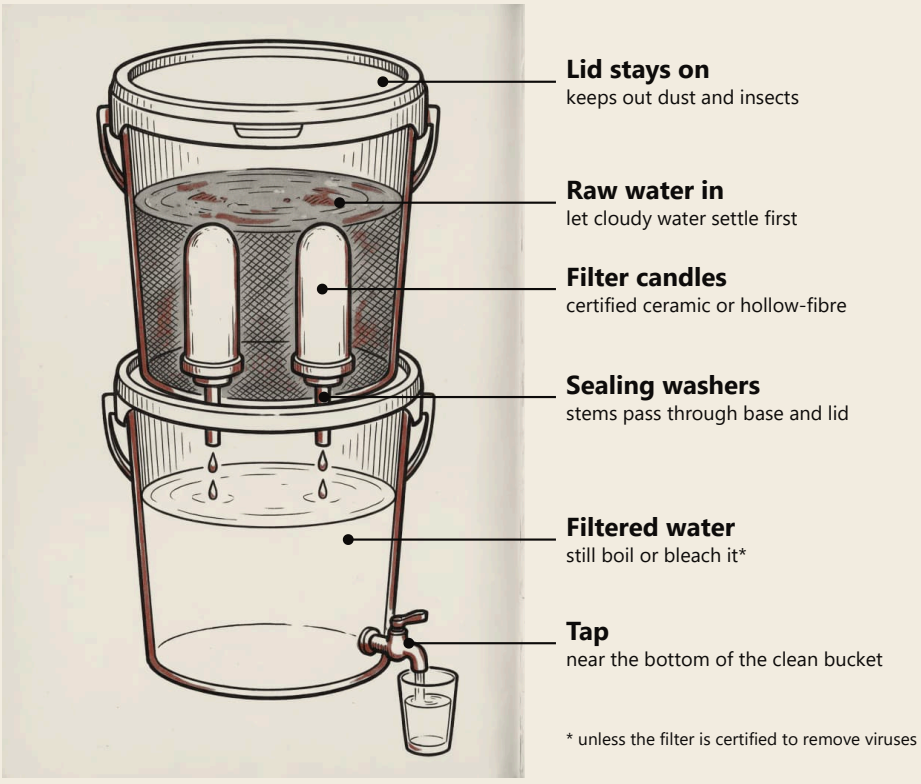


Figure 1.10. A two-bucket gravity filter in cross-section.

1. **Label** the buckets "DIRTY" (top) and "CLEAN" (bottom). Never swap their lids.
2. **Drill** the base of the dirty bucket, and the lid of the clean bucket, to fit the filter candle stems (check the filter's instructions for the size).
3. **Drill** a hole near the bottom of the clean bucket and fit the tap.
4. **Fit** the candles through both, with their sealing washers on each side.
5. **Flush** the candles as the maker says, then fill the top bucket and let gravity do the work.
6. **Disinfect** the filtered water (boil or bleach) unless your filter is certified to remove viruses.

> HAZARD: A cracked ceramic candle lets germs straight through. Check candles regularly and replace them when the maker recommends.

SUMMARY

REMEMBER

- **4 litres (1 gallon) per person, per day, for two weeks.**
- Fill bottles and pans (and the bath, for washing) **before** the taps run dry.
- Your **hot water tank, pipes and ice** are a backup supply.
- **Boil for 1 minute**, or **2 drops of bleach per litre** and wait 30 minutes.
- Fuel or chemical smell? **Don't drink it.**
- No water left? **Rain, dew, streams**, then a **solar still**. Always treat it.

CHECKLIST

- [ ] Two weeks of water stored for everyone (and the pets)
- [ ] Dates written on home-filled containers
- [ ] We know where our hot water tank drain and stop tap are
- [ ] Plain unscented bleach and a dropper stored together
- [ ] Gravity filter built, or a portable filter bought
- [ ] Figure 1.3 and Figure 1.5 printed and stuck inside a kitchen cupboard
- [ ] Rain-collecting sheet and clean containers ready
- [ ] Bottle filter materials (sand, gravel, charcoal) set aside
- [ ] Iodine or purification tablets in the kit

Sources: References 9, 10, 11, 12, 13, 21, 39 (listed at the end of the book).