Survival tips when you stay at home

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These tips were tested by me over 30 years during camping and power outages in many conditions including below freezing weather. **Unlike other sites which do not test their ideas under the worst conditions, this file will tell you under which conditions it works, and when it doesn't work.**

The PDF version is here: https://wordsalad.info/surv2019.pdf but is not updated as often as this HTML file.

2 License

3 Foundational ideas

1. Having a positive "can do" attitude is important. Do not fall into the depression black hole. Attitude is the foundation for everything else. Focus on the positive, not the negative.
2. Never rely on a store for your food, or on someone else to take care of you, especially the government. Be self-reliant.
3. Always have equipment ready, repaired, cleaned, possibly refilled and tested *before* you need it.
4. Preventing injury is very important. A bad infection, untreated, can maim or kill.
5. Remaining calm is also important.
6. Working as a team to get all necessary work done is important, this cannot happen if people have lost their minds or panic.
7. Hope for the best, prepare for the worst. So if the worst happens, you are covered.
8. Remember, test any equipment thoroughly at home before you need it, to make sure it works under *all* conditions, from well below freezing to 112F degrees.
9. Rotate food and water supplies every so often.
10. Save glass jars with screw on lids, they can be very handy later for storing food, etc.
11. Buy equipment that you will enjoy using, and food that you will actually eat.

4 When the power goes out

Notes on what happens with the power goes out in a wide area for more than 3 days, for example.

1. Even if you have a gas furnace your blower will not work. There will be no heat. Natural gas pumping stations may also fail shortly.
2. City water towers will not refill with water, and your electric well water pump will not work.
3. No one to fix power infrastructure so power goes out.
4. No power to pump gas for trucks to bring in food and supplies.
5. There will be no electric refrigeration.
6. No clean water.
7. There will be plenty of chaos and fear. People will be hungry and thirsty and begin stealing and robbing. Desperate people do deserpate things. Animals will no longer care about the law.
8. No electric lights.

5 Overview of the 3 basics

The 3 basic needs in a no-power situation are, in order of need: water (for drinking and washing), fire (for heat and cooking), food.

5.1 Water

A person can survive only about 7 days without water. But that does not mean they can walk and do chores all those 7 days as the body gets weaker and weeker without water. The body needs water to do bodily processes, which also includes warding off disease. Without a good supply of drinking (potable) water a person can die. Water is critical to bodily processes and survival. New water filters do not need to be cleaned, a rinsing will do just fine.

Learn to use water filters and the different types.

Some of the microbes in unfiltered water that can make you sick are: viruses (the smallest of the critters), bacteria, protozoa (like giardia), and the cyst form of some protozoans which will hatch inside you.

First, "filtered" water does not mean "potable" (drinkable) or "purified" (drinkable) water. Your water filter from your faucet will not remove bacteria or viruses! The kitchen faucet filters and Brita filters are only designed to remove the bad chlorine taste from city water, *nothing else.* However the word "filter" is often used to indicate water that is safe to drink. Technically, only "potable" water is safe to drink.

Get the more expensive camping filters, not the cheaper kitchen filters, your health depends on it.

WARNING: Most general purpose filters will not filter out all chemical contaminants. You are still at risk for being poisoned by these. Some filters will filter out only SOME of a given chemical, but not all of it. This applies to filtering urine also.

5.1.1 On activated carbon filters

Carbon filters are not just any carbon, they are activated carbon. That is, the carbon is specially treated with a high heat, high pressure steam process that cannot be replicated at home. However, charcoal from a fire might work slightly in a pinch. But it's up to you if you want to bet your life on it.

Activated carbon filters have 1000% more tiny pores than regular charcoal and that's how they trap contaminants. Once these pores are full the filtering ability is greatly reduced and you must get new carbon. Check on Youtube.com for information on what activated carbon is and how it's made.

Activated charcoal can be found in pet shops that sell aquarium carbon for aquarium filters, and several other places. Rinse this activated charcoal well before using it to filter drinking water.

However, on a show called Rough Science, they did use normal carbonized wood to make a water filter. They showed it filtering food coloring out of water. But use at your own risk.

5.2 Fire

Fire can be used to keep a person warm. If their body temperature goes down too low they can suffer from hypothermia. Symptoms of hypothermia include hallucinating, feeling numb, feeling burning hot and taking off their clothing, and it can eventually lead to death.

Fire can also be used for cooking, which is important to kill any microorganisms on any food the person might eat. Prevention is important.

Fire will be addressed in detail in another section.

5.3 Food

A person can live about 4 weeks without food, but that doesn't imply they will be walking around all 4 weeks. For most people after 3-5 days they will have a hard time walking around. Some will be able to walk a bit longer. Lack of food, especially vitamins, also means a person is more susceptible to disease.

There are different kinds of food you can bring with you, like MREs or dehydrated meals, and food you can gather in the wild. These are beyond the scope of this document. Just be sure to cook your food well to kill any pathogens in it.

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6 BEGIN DETAIL SECTION HERE

7 Water

Be careful when using different methods to purify water. Know the limits of each method. For example, iodine does not work as well with cold water, or to kill cysts of parasites like cryptosporidium.

7.1 What is filtering vs purification?

A water "filter" does not make water fit to drink, only purifying water kills or removes the microbes that will make you sick. Typical table-top water filters which only have a carbon filter will NOT remove pathogens from water and will not make it safe to drink.

7.2 Cleaning water purifiers

You must clean the water purifiers sometimes, refer to the instructions for your filter on how to do this. With Berkey ceramic filter elements you take the filter elements out of the filter, and scrub the elements with a clean plastic scrubbing pad to remove the very top layer of pores that are clogged up, thus revealing a new set of unclogged pores. Soap is optional. If you use soap to clean the elements, make sure to rinse them well and remove all soap.

7.3 Prefilters

A prefilter will remove some of the physical debris from the water so it won't clog up your filter element as often, and your filter element will not need to be cleaned as often. If your filter is taking a longer time to filter water, the elements may be clogged and need cleaning. Usually a plastic brush can clean them off if you can access the filter.

A prefilter can be as simple as a clean sock, or clean nylon poncho, something that will let water through and only let mininal silt through. A coffee filter should work in a pinch. You can also get sock filters on Amazon or Ebay with a certain pore size, but small pore sizes will certainly dirty up faster and require cleaning more often. Silt may make your water taste bad but it won't hurt you. The other bugs can make you so sick you may not be able to move for 2-3 weeks, but everyone is different.

7.4 Gravity filters

I like gravity filters because you can put it somewhere, fill it with water, and forget it. It will do its job automatically without additional work from you.

There are many price points for gravity filters. Choose one that works for you.

Berkey filters are one of the best water filters and can use 1-4 ceramic filter elements depending on the model. The filter elements are ceramic and have tiny ports so they will not let bacteria through. Some filters have smaller pores and will prevent viruses from getting past the filter. It works by pouring water in a top bucket with the ceramic filters in it, the water goes through the filters and goes into a plastic straw in the bottom of the filter, which then pokes through the bottom of the top container, to drain into a bottom container with a spigot. But watch yours seals around the filter elements. It only takes one drop of unfiltered water to make you sick. Sometimes giardia can make you so sick you cannot help yourself, so prevention, and attention to detail is key.

With more elements the Berkey can filter more water per hour.

Berkey filter elements can last for 10,000 gallons thus the water is cheapest per gallon with a Berkey, but the initial cost is more, about $350usd or so. There are other, cheaper gravity water filters out there which use a bag to put the "dirty" water in and the potable water comes out a hose after the filter element.

Check Amazon for Berkey water filters, or similar designs. There are other sites that sell this, but if there is a rush on filters you may not find a single one for sale, so get one now.

WARNING: ceramic filters are designed to filter out particulate matter, like bacteria, but not chemicals. They will filter out bacteria and large viruses, but their filtering ability is limited for chemicals. Do not filter your urine, drink it, and expect things to go well. THis can lead to kidney failure and death.

Above: Big Berkey water filter. Big Berkeys come in several sizes.

7.5 Pump filters

Pump filters work fine but require a person to pump the water through the filters. There are several brands of pump filters sold in camping stores. Most have a prefilter attached to a hose that you put in the unfiltered source water.

7.6 Straw filters aka survival straws

Straw filters are small filters which often need a sucking action to pull water through tiny pores in the filter. Some of them can act as small gravity filters. But these may be limited to filtering just 100 gallons or even less before they need to be replaced.

Above: Survival straw

7.7 Solar water pasteurizers

This is when you use a clear bottle and put it in the sun to kill pathogens. This can be useful if you are close enough to the equator, or you get lots of sunlight, and you can be guaranteed the water temperature gets hot enough to kill pathogens, otherwise they are not useful in some cases, like in the winter.

Above: Here's a device to tell you when water has reached a pasteurized temperature using the sun.

The device above is a "water pasteurization indicator" (WAPI) and is at https://solarcooking.fandom.com/wiki/Water_Pasteurization_Indicator. And here's a DDG search: https://duckduckgo.com/?q=water+pasteurization+indicator&t=h_&ia=shopping.

These items, called WAPI, were designed to be used with the sun to heat and pasteurize water but the nylon cord would melt if the WAPI was used with fire. Here's a WAPI that can be used with fire: https://www.sunoven.com/product/water-pasteurization-indicator-wapi/.

1. Make your own WAPI. Caution, this may never have been tested. https://survivallife.com/make-wapi/

7.8 Boiling water

Boiling water is very effective and easy to do. Follow these steps closely.

1. Pre-filter water as best as you can to remove chunky bits. You can use a clean sock, clean tshirt, clean nylon fabric from a coat, a clean towel, or something similar. A coffee filter would work but can clog up quickly and take a long time to filter much water.
2. Bring the water to a boil. Now boil for 5-10 minutes. Make sure you understand the difference between simmer, fast simmer, and boiling! They are not the same.
3. Let water cool.

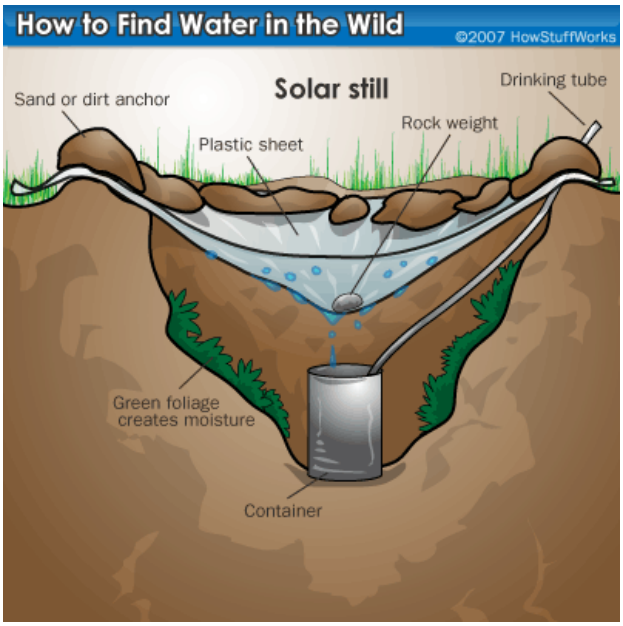
While it might have silt or cloudiness in it, and it might taste bad, the water is now safe to drink.

7.9 Distillation

You can set up a homemade still whereby you boil the water, and condense the steam into 100% pure H_2O. This is the only way to get rid of chemicals in the water. The water that condenses is 100% H_2O and contains no minerals or other chemicals.

See this DDG search: How to make water still.

Above: One type of simple water still. The blue water jug really should be in a pan or bucket of cool water to enhance distillation.



Above: A solar still condenses water vapor from the ground into fresh water.

7.10 Iodine tablets

These work by putting an iodine compound in the water to kill nasty bugs in it. But some bugs, and forms of bugs, are resistant to iodine tablets.

These work fine but they take longer to work in cold weather, and take even longer to work to kill cysts, which is a hibernating form of some protozoans which can make you very sick, even kill you. The shell of the cyst is tough so it takes even longer to make the water safe.

7.11 Water sources

Purify all water first to make it safe to drink.

1. If you are bugging in, you can drain water from your hot water heater, but make sure you purify the water before drinking it. Legionnaires Disease can grow in water that is cool enough, like when a person turns down the heat of their water heater to save money. LD can be fatal! For more info see this search: What is legionnaires disease.
2. Rain from barrels. (Could have bird feces, algae, or mosquitoes in them. Always boil this water.)
3. Clean lakes and streams (not in the city).
4. Melted snow.

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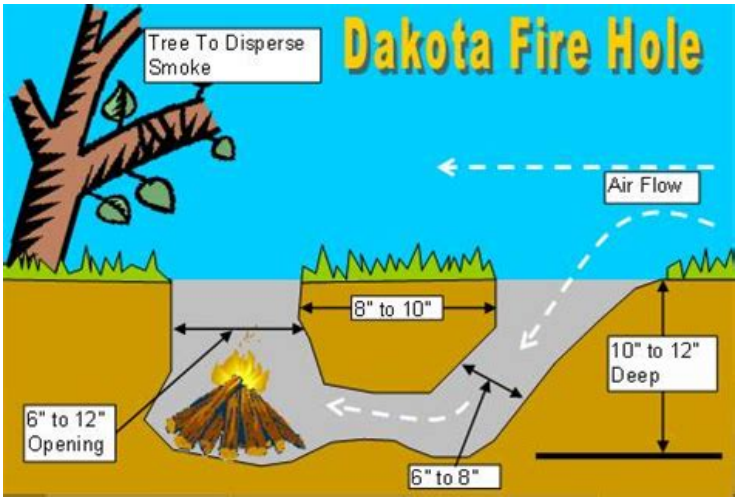
8 Fire

Fire needs 3 things to work: fuel, oxygen, and a spark, heat or flame to start it. There are several sizes of fuel used when starting a fire, from small (tinder), a little larger (kindling) and regular (normal chopped logs and bigger branches).

To start a fire, gather your item to make a flame or spark, like a lighter, and some tinder. Gather some kindling, which is small wood, like pencil width or smaller. Make sure the wood is very dry. Gather larger fuel like thumb width, and higher, set that aside.

8.1 Locate your fire

1. Avoid putting your fire outside under a tree, especially pine trees. Pine trees are VERY flammable, especially when they are dry.
2. Locate your fire in a clearing. Remove all plants from the area for a 5 ft radius and reveal dirt.
3. Leave nothing flammable within 5 ft of a fire. Remove all leaves, pine needles, sticks, paper, tents, etc from this area.
4. You can use a Dakota fire hole if you want. You can search for that on the internet. It releases less smoke and focuses the heat of the fire.



Above: Dakota fire hole side view.

For a simple Dakota fire hole you can just dig a simple "V" shape where the bottom of the "V" connects underground. Put your fuel in one side, so air can go in the other side.

8.2 Tinder

Tinder is fine pieces of flammable material that catches fire easily. There are many types of tinder which will start on fire easily. Keep your tinder safe and dry in waterproof containers.

8.2.1 Tinder to catch sparks from flint

Not everything will light when it catches a spark from a flint, but here are some that work.

1. Use *real* cotton puffs with vaseline. Fake cotton puffs will not always be reliable.
2. Fine magnesium shavings.
3. Dry paper towel. Works best with sparking fire starter, sometimes called a "flint" but is actually "mischmetal".
4. Char cloth. This is easy to make from *organic* cloth like 100% cotton scraps. Do not use man-made fibers for this.

8.2.2 Tinder to light with a match or flame

Various tinder or "fire starters" that get your fire going. For best results, **carry some with you in a waterproof box**. Boxes with a rubber or silicone seal work best. Rubber deteriorates over 4-5 years and silicone lasts much longer.

1. Use paper or cardboard dipped in wax. Junk mail works fine for this.
2. Dry bark shavings.
3. Dry pine needles. Pine has pitch in it and so it will catch fire more easily.

4. Pine pitch. This is the dry chunky stuff that is near a tree wound. The sticky sap might also work.
5. Corn chips or Doritos. These have oil on them and burn well.
6. Wood shavings. Make sure these are dry.
7. Fatwood. This is a type of wood taken from the base of a pine tree which is saturated with pine resen more than other pines. It grows mainly in the southern US but other pitch pines might be able to be used in other areas of the US. Make it into thin shavings or feather stick.
8. Feather stick. Take a dry piece of wood, carve thin shavings out of it without disconnecting the shavings from the stick. Use this for tinder.
9. Very dry moss or lichen.
10. Twine or cotton string covered with pitch or wax.
11. Birthday candle. It's small and portable and light and it has wax on it which will help things burn.
12. Alcohol sanitizing gel.
13. Firestarters made from dryer lint or a cotton ball dipped in wax.
14. Carboard dipped in wax. Even waxed food cartons like from milk, nut milks, soups in a box, wine in a box, boxed water, juice in a box, etc.
15. Waxed paper, like from food.
16. Paper towel, paper, can labels, kleenex, toilet paper (aka bog roll), etc. Paper towel works great for catching a spark from an old lighter with no more fuel.
17. Oil-based fire gels. These burn a long time so can be helpful when lighting damp wood.

Above: Feather stick

8.2.3 Fire helpers

Fire helpers help you get a fire started in less than ideal conditions. Some of these are dangerous, gasoline is explosive! Use with extreme care! These can help if you only have wet tinder and wood to work with.

1. Alcohol (80% or better)
2. Liquor, 160 proof (80%) or better.
3. Kerosene, lighter fluid, diesel fuel.
4. Anything flammable like carburator cleaner, hairspray, sanitizing (alcohol) gel at least 80% alcohol.
5. Waxed paper, from gum, food, or another source, also burns well.
6. BBQ starter fluid.
7. DO NOT use gasoline, it's explosive!
8. Lighter fluid.

8.3 Sparks, heat or flame

There are many devices to create a spark or flame. Here are just a few.

1. **Lighter with lighter flued.** Do not depend on cheap or Chinese lighters. Lighters can use lighter fluid, butane, or even be electric and recharged by a USB port. (Some USB lighters use a heating element, some use a high-voltage spark to make heat. The latter are called "plasma lighters".) The "hurricane proof" USB lighters use a battery to make a nichrome wire red hot.
2. **Lighter out of lighter fluid.** A lighter that just makes sparks can still be useful if you have the right tinder, like a paper towel.
3. **Plasma lighter.** A plasma lighter runs on a batter and makes a purplish line of plasma. The down side is the battery must be charged from time to time. And different styles may make it hard to reach inside a pile of tinder. However they are wind proof.
4. **Matches.** Make sure to cover 90% of the match, including the match head, in wax so they are waterproof and put them in a sturdy, sealed container. They also make waterproof matches which will burn when wet and in the rain.
5. **Magnifying glass** (may not work on cloudy days or in winter). And plastic ones may have more problems. Test this at home under bad conditions before you rely on it. These work best on sunny days when more solar energy reaches the earth. That is, they will not work well on cloudy or overcast days.
6. **Flint and steel.** This is not the flint rock, this is the man-made black rod also known as "mischmetal".
7. **Glycerine and potassium permanganate** (find PP at water softener stores). When combined it creates flames. Use outdoors only.

8. **A battery** of at least 3 volts or more, and steel wool. Make sure steel wool is dry and battery is good. 2 AA batteries in series also product 3vdc and will likely work, as will a lithium battery which makes at least 3vdc.
9. **Fire piston.** This uses pressure to ignite a small piece of tinder on the end of it. These can be wood, plastic, or sometimes metal and when used properly, they really do work!

Above: Mischmetal, aka "flint" and steel striker

Above: A plasma lighter with 2 "lines" of plasma.

There are other ways to start a fire like with a fire drill or fire bow but these are not covered here.

Always have 2 ways to start fire. You will need one as a backup.

Above: Lemon battery trying to start a fire. A battery requires 2 different metals to work. The 2 different metals used in this image appear to be zinc nails and brass. "Galvanized" nails are coated in zinc.

To find the best materials to use in a battery do a search for "galvanic table" or "galvanic series table". The 2 materials with the biggest difference will be the best, but will also corrode the fastest. Example see this table: https://www.engineeringclicks.com/galvanic-series/

On the galvanic series table choose one material from the top of the chart and one material near the bottom of the chart. Yes you can use 2 materials with negative galvanic values, they will just make a lower voltage per cell.

To make your own battery and increase the voltage of all the cells, wire the cells in "series". That is, wire the plus wire, to the negative, to the plus, to the negative, etc.

8.4 Kindling

Here are examples that make good kindling.

1. Kindling is smaller sticks, about half the width of an adult finger, to finger width.
2. Dry pine cones. Pine cones, and pine needles, have pine pitch in them which is flammable.
3. Newspaper, rolled up. Be careful as this can put red hot ash floating around in the air and start a fire.

8.5 Fuel

Fuel is just larger sticks to make the fire burn longer. You can also use pine cones if you have lots of those. But the thicker the fuel, the longer it will burn.

Try to find dry sticks on the ground first. If those are not dry enough, use dead branches that are lower on the tree. If they break easily, they are probably dry enough.

8.6 Start a fire, Bottom up method

The bottom up method means you start with smaller, more flammable stuff on the bottom of your pile, and put bigger stuff on top. The idea is the flames will rise, and help larger pieces of wood over the flames catch on fire. Let's assume you are in the woods. Start by clearing a 2 foot wide area of brush, leaves and dry grass. If you have to get rid of grass, dig out a hole a few inches deep so the fire will not touch nearby combustible grass.

WARNING: Dry pine needles are very flammable, keep them well away from the fire, or use them as tinder. Do not make a fire under a tree as it can ignite and start a forest fire.

1. Put down your tinder.
2. On top of the tinder, put your thin kindling. Do not put anything else on the pile yet.
3. Light the tinder. When the fire gets going, add 1-2 pieces of wood that are slightly larger than the kindling. Be careful not to put on too much kindling that the fire doesn't get enough oxygen.
4. If the fire dims, blow on it in long, steady breaths to fan it up. Turn away from the fire and smoke when inhaling again!
5. As the fire gets stronger, add 1-2 more slightly larger pieces of wood. Do not add too much wood too fast or the fire will go out.

6. Done!

8.7 Cooking stoves, DIY

There are many types of stoves which one can make. There is the rocket stove, an alcohol stove, and hobo stove for starters. A great collection of DIY stoves with lots of info on fuels is here: http://zenstoves.net/. I highly recommend it.

8.7.1 Hobo stove

This is one of the easiest ones to make at home and only requires a metal can and tin snips to cut the metal. A Dremel tool can also be used to cut the metal can. A drill is useful to drill air holes in it too. A churchkey (used to punch holes in cans of punch) can also be used to make the holes. Make sure to drill enough holes in the sides on the top and bottom. Good air flow is required. These can use many fuels from wood chips, to wood sticks, and pine cones, to coal, rolled up cardboard, DIY paper bricks, or whatever is at hand.

These must be run outdoors as they produce smoke. A large metal coffee can is great to make one of these. Other small items can be stored inside the stove, but the stove will have a lot of soot. These can also be made from cans from Walmart, or a larger metal camping cup also at Walmart.

Other sources of metal parts to make a Hobo stove out of:

1. 1 gallon paint can, even 1 quart paint can.
2. Metal silverware holder from Walmart or Ikea. You will need to drill holes. A step bit works well for the larger holes.
3. Metal strainer in a cylindar shape. Actually, any metal strainer would work as it has lots of holes.
4. Dollar Tree used to have skinny metal water bottles. I prefer metal containers 16-32oz for a hobo stove.
5. Metal coffee can, or other metal can.
6. Stainless steel food storage bowls. These will work but tend to be less tall than other containers.

Above: Small hobo stove made from one can

Above: Metal camping cup from Walmart, $4.97usd in 2020

Above: Water bottles from Dollar Tree look similar to this. You can use it as a pot if you cut the top off.

Above: Older US military camp stove kit with canteen and cup.

Above: Here's the IKEA silverware holder, about $15usd. It already has holes in it for you. Similar ones from China are $3usd.

Above: Here's the stainless steel silverware holder, you will need to drill holes in it.

8.7.2 Alcohol stoves

These do not work well in temperatures under 40F, but they are small, light weight, compact, and produce enough heat to boil a pot of water. Fuel is easy to find and not too expensive. **These can be safely run indoors.**

Alcohol stoves can be used for heating or cooking, this section covers cooking, a later section covers alcohol stove designs used for heating indoors.

There are also commercial alcohol stoves made for boats. Alcohol is safe to burn indoors. People use isopropyl alcohol (IPA) or methanol (methylated spirits). For methanol look in the paint section of a big box store. In the US we call the alcohol "methanol" or "denatured alcohol", in Europe they might call that "meths" or "methylated spirits".

These can also be as simple as a tunafish can with alcohol dumped in it and lit! Do not put your pan right on top of the can or the flames will go out. Use a pot stand in this case.

Above: DIY soda can alcohol stove

Above: German-military-style alcohol stove kit with pot. The burner itself is a Trangia style alcohol burner.

NOTE: Alcohol can be stored for years and it won't go bad. Gasoline can be stored for a while but must have additives put in it or it will go bad in about 6 months. Alcohol is safe to burn indoors. Gasoline is not.

8.7.3 Rocket stove

These can be many sizes but they produce a lot of heat and little smoke. Normally, wood is used as a fuel. Rocket stoves come in many styles but the basic style is: a tall tube with an opening in the top, and opening in the side of the bottom to insert fuel. These must be used outside in a well ventilated area.

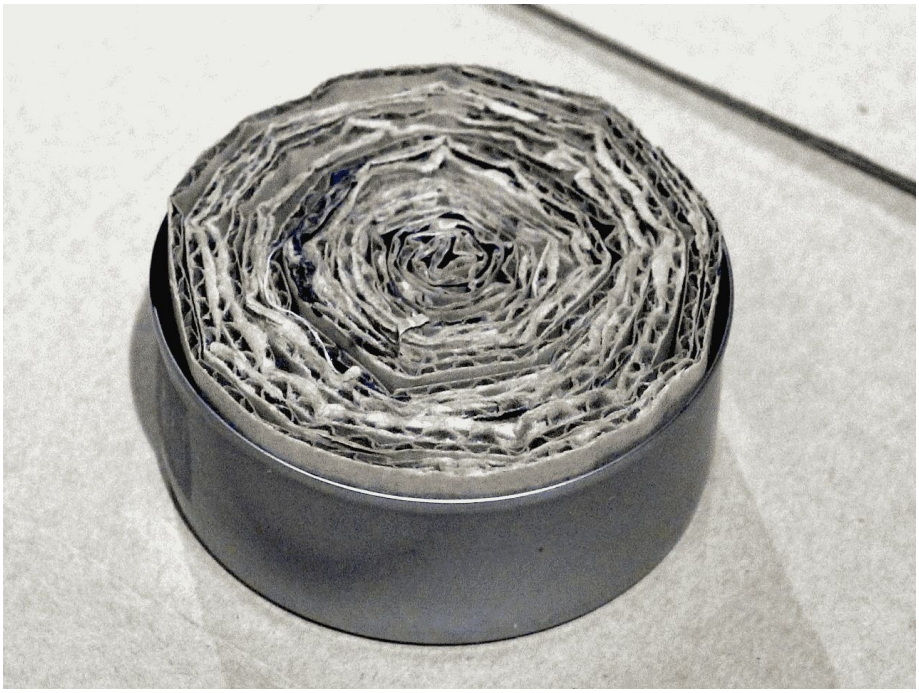
Above: One rocket stove style. It appears this one can be taken apart easily and stored flat. However the steel parts will make it heavier.

Above: Rocket stove made from 2 cans

Above: Rocket stove made from cinder blocks

8.7.4 Buddy burners

These are old fashioned tuna cans where people put in a roll of cardboard, edge up, and pour wax over it. They make a lot of soot on your pans but they do work. To protect your pots, cover the outside of pots and pans with dish soap first, then use pots to cook over a buddy burner.



Above: Buddy burner which goes back to 1950s girl scouts or even further.

8.7.5 Gelled alcohol

These are normally bought by most people but they can be made if you are handy. One brand is called Sterno, and sometimes are sold in the Dollar Tree in the US. They normally come with a cap which can put out the flame so they can be reused later. They are also used for heating pans and fondue.

Above: Sterno gelled alcohol can without a wick, some come with a wick.

8.8 Solid fuel stoves

Solid fuel stoves can be handy. They can be quite small but you must always buy the fuel from somewhere, or you can burn sticks in it. One brand is Esbit.

Above: solid fuel stove under pot

8.9 Toilet paper stove

This was invented as a heater for an outdoor worksite but works fine as a stove also.

1. Find a 1 pint empty paint can that is clean and has a tight-fitting top.
2. Find a toilet paper roll. Remove the cardboard center.
3. Squish the toilet paper roll inside the can.
4. Fill with alcohol at is at least 80% alcohol. Isopropyl alcohol and methy alcohol (methanol) can be used. So can high proof liquor.
5. Add the top and seal tight.

When you use it, simply remove the top and light it. The toilet paper will act as a wick for the alcohol and the alcohol will burn. To put it out, put the lid back on tightly.

1. Link. https://lifehacker.com/diy-stove-made-from-a-paint-can-toilet-paper-and-rubb-5979313

8.10 Propane stove

There are various propane stoves on the market, but you must make sure to have a supply of propane to use it. Some use small propane cylindars, some have a different connector and can be used with a larger propane bottle.

The Coleman catelytic stove uses propane and it claims it's safe to use indoors. I've used a propane heater on top of a 20lb propane tank to heat my garage and never had a problem with CO2.

8.11 Other interesting stoves and accessories

Above: Pot holder made from hinges. This style hinge only opens 3/4 of the way. This appears to be a "gate hinge".

Above: Some type of portable DIY stove

Above: Alcohol stove made from mint tin and rock wool. You will need a stand for this to raise the pot up about 2 inches, pots should not be placed directly on top of this stove because they will block air flow.

Above: Some type of triangle stove, probably commerical.

Above: A Kelly Kettle is used to boil water, which can be used to cook rice, pasta, etc. A similar design is called the Ghillie Kettle.

8.12 Notes on stoves

You can make any type of stove with materials at hand as long as you understand the basics. Make sure the stove is strong so it won't collapse and make sure the fuel gets enough air to burn.

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9 Food

There are many types of food one can store for long or short-term power outages. The types are:

1. Canned food. Make sure to have lots of vegetables, you will need the vitamins from them to prevent illness.
2. You can eat canned beans cold if you have to. Canned chickpeas might be more numerous on the shelves and they have protein as well as carbs.
3. Freeze dried food requires safe water to cook it in.
4. Canned food can be opened and carefully heated in a can. Make sure the food doesn't bubble over, which it will if it is too full and starts to boil.
5. Look for local sources of berries or nuts, many of which are in season for only a brief time. Cultivate and multiply them if you can.
6. Canned meat can last about 2-3 years in storage but my test was when they did not use plastic liners in cans, so the metal tainted the meat after 3 years.

7. Dry food that just needs boiling water to cook like pasta, rice, dry beans. Can last 2 years in storage, more if you use oxygen absorbers in a sealed bucket.
8. Dried fruit like apricots, raisens, etc.
9. Various kinds of nuts.
10. Freeze dried meals. You normally just add boiling water to these, but they are usually super high in salt and are expensive. Can last 3-5 years in storage.
11. Dried meats like jerky. Will last about 1 year in storage in their original container, longer if you put them in an O2 proof container with oxygen absorbers.
12. Military MREs. I think their stated shelf life is 8-10 years. That does mean they will taste good though. And they tend to be VERY short on fiber. Add extra fiber yourself.
13. Crackers, chips, snacks for carbs.
14. Dried meats like jerky. There used to be dried chipped beef that came in a jar and did not need refrigeration. I don't know if they sell that anymore in the US.
15. Learn which wild plants you can safely eat. Some can be eaten raw, some must be cooked to destroy the toxin in them.
16. Salt: You will get LOTS of salt from dried meats. Otherwise add your own salt to dried beans and rice.

It's a good idea to store these in a sealed 5g bucket with oxygen absorbers. When food absorbs oxygen, it can tasted quite bad, and give you a stomach ache but other wise will not make you sick. Most plastics will slowly allow O2 through it and O2 resistant plastics will cost more. "Food grade" buckets are not O2 resistant, they are simply cleaner.

Other types of food are beyond the scope of this document at this time.

Get a good book on local wild food you can eat, and how to prepare it. You cannot eat all wild foods raw. Learn which ones you can eat raw, and which ones you can cook. You cannot eat all the parts of a plant at all times of year. Learn which parts you can eat and when.

9.1 On 5 gallon buckets

1. 5 gallon buckets are durable and mouse-proof. They are not rat proof or squirrel proof.
2. 5g buckets can be sealed with screw-on lids. Buy those separately.
3. "Air tight" buckets DO NOT mean O2 proof. Use oxygen absorbers in the bucket, bought separately. Change O2 absorbers once a year (my guess). Oxy absorbers change color when they no longer work. Read the directions.
4. Look for "gamma seal" lids to seal your buckets. Right now a lid alone is about $18usd on Ebay.
5. Look for glass jars with hinged lids and a rubber seal. They store dry food better but can be pricey. Shop around. They come in a variety of sizes, I've seen up to 2 quart jars. Buy extra seals and replace them when they get cracked. Do not place seals in dish washer as the water is too hot for them.
6. Containers that pump out the air do not work. Instead, spray a non-reactive gas on top of the food to protect it from oxygen. One type is a wine preserver spray, about $10usd per can. In my experiments with wine, this spray works the best.
7. Pre-made survival food buckets are very expensive. You can make your own for about half the price. Shop around.
8. Freeze dried food lasts in storage about 3-5 years but not much more than that. It's also very expensive.
9. Dried beans and rice can provide a decent food in a pinch.
10. Get various spices and sauces for your beans and rice, it gets boring after a while.

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10 Warmth and heat

Keeping warm in the winter can be critical to survive. Here we explore various types of heat that are safe for use indoors in the home. It's better to first dress in layers to preserve your body heat, then add a bit of warmth.

10.1 Mr Heater propane heater

"Mr Heater" might be the product line while "Buddy" and "Big Buddy" might the different products.

Above: The Buddy propane heater which uses small propane bottles.

10.2 Butane lighters

There are some small butane lighters that are safe to run indoors but they have little fuel, and will only heat a small space, like a tent interior, not a room in a house. Since there is little fuel it may only work 1-2 hours. And fuel can be relatively expensive compared to other heating methods.

10.3 Kerosene heaters

These are much larger than a kerosene lamp. They come in a variety of shapes. These work but can make your house smell like kerosene. Plus the wick must be maintained. Plus old kerosene may not work after 2 years. Some models you can cook on. Wicks should not be left in the unit when the unit is in storage as the water from the kerosene can ruin the wick.

More info here: https://en.wikipedia.org/wiki/Kerosene_heater.

10.4 Marine alcohol stove

Marine alcohol stoves are safe to use indoors on a boat or in a house. They use methanol to burn. 90%+ Isopropyl alcohol might work in a pinch. 70% isopropyl alcohol might work but you may damage the wick by getting it soaked in water (70% IPA is 30% water). Get them from a boat supply retailer or online.

For fuel, look for methanol (methylated spirits) in the paint section.

Above: Marine alcohol stoves come in many shapes and sizes.

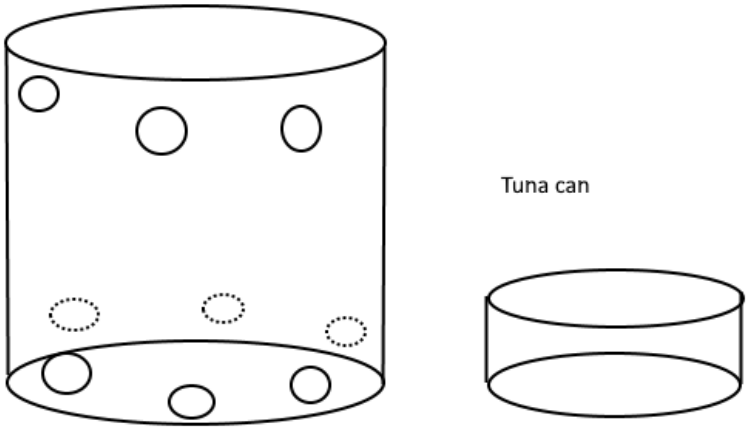
10.5 Alcohol stove for heating

This is a simple stove where you pour alcohol in a pan, like a tunafish can, and put it on a fireproof surface, and put a baffle on it so the heat does not set afire something over it. Alcohols to use: Methanol (methylated spirits, find it in the paint aisle of your store or at paint or hardware stores,

90% isopropyl alcohol or higher, YELLOW bottle of HEET in automotive department. The yellow HEET might be cheapest per oz. based on one Youtuber test.

You must use a shallow pan no higher than 3 inches to put alcohol into. Fill the pan with 1" of alcohol, put it in another steel pan, and light it. Do not allow anything flammable within 5 ft above the burning flames.

2020 Baffle for tuna can alcohol stove.
Baffle must be much larger than tuna can
and should be about 10" high or so.
Holes go in SIDES of can not the top.



Above: Tuna can alcohol heater with home made metal baffle. Be sure to have enough holes in the baffle to allow air flow.

WARNING: Aluminum has a low melting temperature and might melt under certain circumstances. Aluminum soda cans (which are thin) easily melt in a bonfire. Avoid using aluminum cans near fire and other heat sources. The thinner the metal the more easily it will melt.

Another alcohol stove:

1. Take 1 clean 1 quart paint can. They sell them new at major hardware stores.
2. Squish a whole role of toilet paper. Now take out the cardboard centers.
3. Squish the toilet paper again and push inside the 1 quart paint can.
4. When ready to use, fill with alcohol and light with a match. The TP acts like a wick.
5. I don't know how long this would last. You can do some trial and error.
6. Use the paint can top to put out the flame. Put the top on tightly for storage.

Above: TP alcohol stove.

10.6 More Alcohol heaters

NOTE: Alcohol is safe to burn indoors. Rubbing alcohol in the US is normally isopropyl alcohol. You can also use methanol (methylated spirits) to burn also. They all burn cleanly and in small spaces. I use them myself.

1. You can take a non-flammable tin can, like an empty sterno can, pint size paint can (clean) or 1 gallon paint can (clean), large fruit or food can, large metal coffee can, even an all-metal cooking pot (with no teflon or other liner).
2. Fill with non-cotton cotton balls or fiberglass insulation. A filler of perlite might also work.
3. You can use metal mesh to keep the cotton balls in place if you wish. You can get metal mesh from a dollar store metal mesh strainer, or use woven fiberglass from a Bondo repair kit.
4. Then fill with 90% alcohol or higher.
5. Choose a can where the top WIDER so there will be more flame to produce more heat.

Smaller cans will be useful not for heating a room, but perhaps for heating a tent. A mint tin will work only a short time, maybe 1 hour.

Place the heater on a non-burning surface like a ceramic tile, on a metal stove, on an iron fry pan, etc.

10.7 Chimnea

A ceramic or metal chimnea can also be used indoors. It can be heated with candles, or alcohol heaters. These are normally 2-4 ft high. If used indoors do not burn wood or charcoal in this. Here's an idea: https://dengarden.com/home-improvement/Make-a-decorative-indoor-fireplace-and-emergency-heater

10.8 Burn candles in other containers

If you burn candles in your vented wood stove the heat will remain inside your house while any smoke will go up the chimney. Open the stove part way to let air in and heat out. But candles can produce soot on surfaces above them so put something above the candles to catch the soot so your oven doesn't get sooty.

Or you can find an old antique coal or kerosene heater and use that. Make sure it's big enough to hold enough candles to actually generate some useful heat.

The tealights only burn 1.5-2 hours so you will need lots of them for 24 hour heat. If they burn for 2 hours, and you burn 5 tealights at once for heat, then you need to burn 12*5 for a 24 hour period, or 60 tealights! In a small room you may find you need less than 5 tealights for night time.

In a pinch, put candles on your stove, with 3 bricks around them. Put an all-metal pot over the candles on the bricks. The raised pot will let air in so the candles can burn. Expect the inside of the pot to get sooty. (You can use a dollar store pot here too if they still sell them.) So line the pot with metal foil for easy cleanup. The pot should not have any type of non-stick surface, or non-metal surface.

10.9 Natural gas stove

Natural gas stoves are safe to run indoors. I use one to heat my kitchen in the winter. The carbon monoxide and carbon dioxide they produce is minimal.

10.10 Propane stove

Propane stoves can use small or larger bottles of propane. In the US the connector for smaller bottles of propane (liquid propane gas) is different than for the larger 20 pound bottles of propane. These are often used for camping and can be found in camping stores.

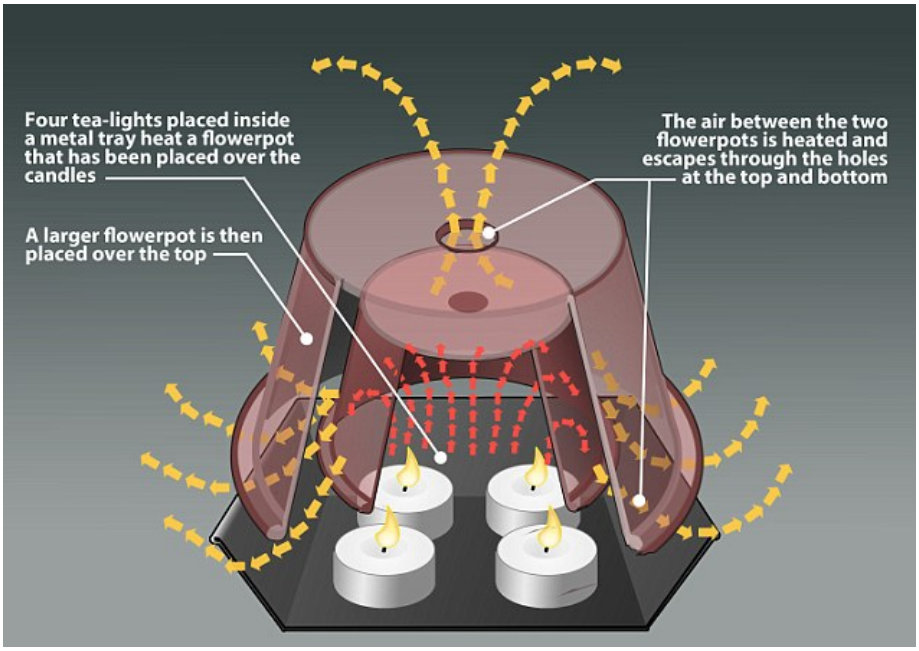
10.11 Candle flowerpot heater

NOTE: I tried this with 3 tea candles and it did not heat the room. Outdoor temperature during my test was 60F. Indoor temperature did not change from 72F after candles burned for about 2.5 hours.

This is powered by candles and does not generate more heat than the candles do. It merely concentrates the heat from the candles. Some people really like them. It can generate more soot than alcohol does when burned so asthmatics must be careful when using this one over the long term. But the flower pots should catch most of the soot. Line the flower pot with tin foil to make cleanup easy. But unless you get cheap candles, they could be pricey to run 24/7.

You can also support the pot with 3 bricks, 3 mugs, or 3 glasses or shot glasses.

The pot must be big enough to fit all candles under it.



Above: Flowerpot heater using candles.

More designs of similar heaters:

Above: A candle carosel from a metal can. The top is cut and bent like fan blades, and the can sits on a long metal pin so the can will spin. The pin sits in an indent in the top of the metal can.

Above: Flowerpot heaters can also use an alcohol or oil burner. Some have metal stands.

10.12 Wood stove

These can be installed in a house but can also double your house insurance rates if you have a wood stove. They need to vent outside. Wood stoves tend to make a lot of dust from tiny particles of ash escaping the stove, and so they would be bad for people with asthma, COPD, or other lung problems.

10.13 Disposable hand warmers

These are one-time use hand warmers, initially wrapped in plastic. Once exposed to the air they generate heat for 6-10 hours. The smaller ones you put in your shoes can last 6 hours, the larger pocket ones can last up to 8-10 hours.

They work by using fine powedered iron along with salt. When moisture in the air hits the mix, the iron powder rusts very fast, thus producing heat.

Some people have made their own but before you use it, it must be sealed in an airtight bag, and the iron and salt must be a VERY fine grade.

10.14 Catalytic hand warmers

While these use lighter fluid, they do not use an open flame. An open flame is used to heat the platinum to get the catalytic reaction started and but the device doesn't run on an actual flame, the starting flame goes out. Once started these get very hot.

Zippo makes one brand of these heaters. There are other brands and Chinese knockoffs too. In reviews, the Chinese knockoffs don't work so well as the catalytic "wick" uses platinum, and the Chinese put less platinum in the wick to lower the cost.

Above: Catalytic warmers have a special "wick" that is not meant to burn.

10.15 Charcoal stick hand warmers

These are essentially a special charcoal in a pocket-sized case. They can generate carbon dioxide so use caution when using indoors or in a tent or hanging it around your neck or putting it in a shirt pocket close to your face. Sticks can burn 8-9 hours once lit. However they can be troublesome to light for inexperienced people.

Above: Charcoal stick warmer, an old technology

10.16 Electric hand warmers

These are charged by USB and can last 4-8 hours depending on their size. Larger ones will have larger batteries which will give a longer run time. Avoid the types that use AA batteries, as they will have a short 1-2 hour run time.

Ones with a larger capacity battery can run 4-6 hours, sometimes more.

Above: USB charged hand warmer

10.17 Other USB powered warmers

There are lots of USB powered items on Amazon like a neck heater, an electric scarf, electric hat, electric vest, electric socks, etc. Just keep in mind you will need a source of power to recharge the powerbank that keeps these going.

10.18 Gel warmers

These use a concentrated sodium acetate solution in them, and when you snap a metal disk inside, a reaction takes place and the gel turns into crystals but also creates heat in the process. The heat only lasts about 10 minutes and to recharge these you need to boil them in water. They may be practical for some people but not for others.

Not very practical, but fun as a science experiment.

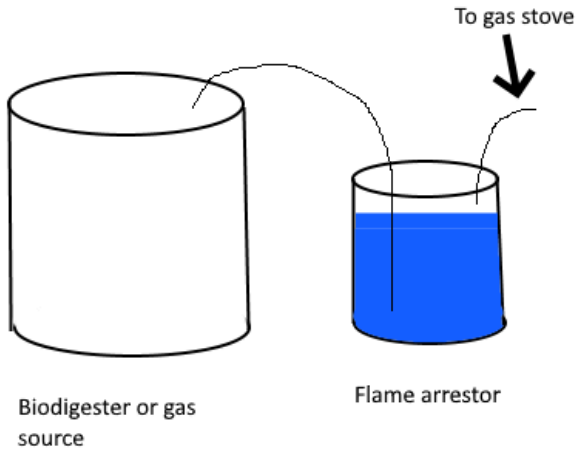
Above: Gel heater, these only heat for about 10 minutes.

10.19 More stove images

Used in many Asian countries.

Above: Rocket stove made with gravel as a filler. See video below.

Above: Commercial Asian wood stove for cooking.



Above: Flame arrestor.

10.20 More stove links

1. Similar to a rocket stove. Made from a paint can, with a larger food can inside, and at the bottom a food can to let in air. Between the paint can and internal food can is gravel. https://www.youtube.com/watch?v=gQyU4lokVe4
2. Similar to a Thai cement stove made from 5gallon bucket. https://www.youtube.com/watch?v=EJPKSZhzJJc
3. Use a sturdy shorter tin can, fill with unburnable stuff like fiberglass, perlite, or rockwool, do not pack, fill with alcohol.
4. Candle stove. Note that candles will put lots of soot on your pans. Put tinfoil on the bottom of your pan before using with candles. Alcohol (methanol) burns much more cleanly.

5. Stove made from 2 metal car rims. You will need metal working tools to make this. https://www.instructables.com/DIY-Rime-Stove-Felgenofen/
6. Cement rocket stove made from a foundation tube. https://www.instructables.com/Rocket-Stove-V3/
7. Cottonball heater stove. https://www.instructables.com/Steel-Can-HeaterStove-the-Cotton-Ball-Heaterstove-/
8. Many images of stoves on https://www.pinterest.com/search/pins/?q=survival%20stove%20cement&rs=typed&term_meta[]=survival%7Ctyped&term_meta[]=stove%7Ctyped&term_meta[]=cement%7Ctyped
9. Many projects with instructions on https://www.instructables.com/howto/diy+survival+stove/
10. Make a biodigester to make natural gas. Put only vegetable and fruit waste into a sealed container with a hose coming out of it to a flame arrestor. Put no meat or fats into the digester. Make sure temperature is 70F-80F degrees so the bacteria will grow. In the flame arrestor, fill it with water. The tube from the digester should be underwater near the bottom of the arrestor. The output tube on the arrestor should be above the waterline and goes to the cooking stove.
11. Find a cheap shallow pot. Fill with fiberglass, then with alcohol. Put grill on top to use for cooking. Burning alcohol is safe for indoor use.
12. Use a Japanese hibachi or round-style grill.
13. Get an alcohol tea pot warmer. It's not good for cooking but will keep heated water warm.
14. An alcohol cooking stove on Aliexpress. https://www.aliexpress.com/item/1005003068910159.html?spm=a2g0o.productlist.0.0.7e7a3ef3m0ccEF&algo_pvid=fa68d62c-a8ee-4ddd-92c3-22bcb4b74c1e&algo_exp_id=fa68d62c-a8ee-4ddd-92c3-22bcb4b74c1e-51&pdp_ext_f=%7B%22sku_id%22%3A%22120000023916070937%22%7D&pdp_pi=-1%3B13.59%3B-1%3B255%40salePrice%3BUSD%3Bsearch-mainSearch

10.21 Indoor heat retention

If the power goes out and you have no heat, make a tent from 3 poles. Take 3-4 poles, put them all together in a bunch parallell to each other. 2 inches from the top of the poles tie them tightly together with rope, string, fishing line, or zip tie. Now spread out the legs and cover the poles with a blanket. Put this ad hoc tent over the head area of your sleeping bag to warm the air you breathe and reduce the chance of getting a cold or sinus congestion.

1. Also use wool blankets, they are very warm.
2. Wear wool socks and a warm hat to retain heat.
3. Wear layers of clothing. Wear a tshirt first then a sweater on top of that.
4. Use a cold weather sleeping bag on your bed. Get one for 0F or lower temperatures.

11 Power

If the electricity goes out will you need power for something? You should be prepared to live without power for 2 weeks at least. But sometimes we want to get news of what is going on via a radio or shortwave HAM radio set, and these need power.

In rural areas, where you don't have city water, your well pump needs power or you will have no water. If you use city water, the pressure might last 2-4 days but eventually the water tower will run out of water if there is no power to replenish the water in the tower.

In this section we will explore various power options.

11.1 Generator, gas or diesel

Pros:

1. Works well for a while until it runs out of gas.

Cons:

1. Noisy and smelly. Must be used outside then you run a power cord inside your house.
2. Uses gas. You must supply all your gas. When your gas runs out, so does your power.
3. Fumes can be a serious hazard if the generator is placed incorrectly. Never use in an attached garage, in a basement, or in the house.

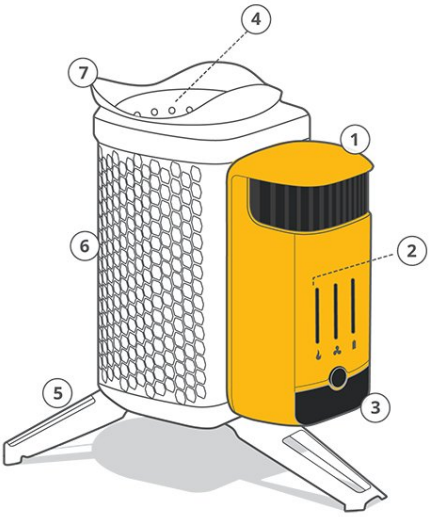
11.2 USB Battery bank

Used mostly to power USB devices and recharge cell phones and tablets. They eventually need to be recharged.

11.3 Biolite stove

When this stove heats up, you can cook with it, and charge your battery bank, tablet, or phone via USB charging. This means it only provides 5vdc. https://www.bioliteenergy.com/products/campstove-2

It is assumed this uses a Peltier element generate power from heat.



A Biolite stove can be used to cook on and to charge USB devices using the heat.

11.4 Solar panels/chargers

These are the smaller solar panels used to charge a battery bank or something else via USB. They work best on very sunny days, almost not at all on cloudy days. Performance is based on your latitude, higher latitudes do not work as well, especially on cloudy days. But they work well in the summer.

11.5 Solar panel systems

This includes a battery bank, or even a single battery, which is charged by a solar panel.

Pros:

1. Once you have the equipment, the power is free.

Cons:

1. May charge VERY slowly on overcast or winter days, especially in latitudes further from the equator.
2. Must be positioned towards the south (in the northern hemisphere) at the correct angle to the ground for best efficiency. Example: At 44 degrees N latitude, the angle of the panel to the ground should be 44 degrees.
3. The batteries don't last forever and will need to be replaced, all at once, every 6-7 years or so, depending on the battery chemistry.
4. Some battery chemistries should not freeze or they stop working.

For great info and honest reviews on all things solar and battery, find Will Prouse on https://Youtube.com.

11.6 Microhydro power generators

These are generators placed in a stream. But they may freeze up in the winter. One might use a ram pump to pump water uphill, but a ram pump wastes about 80% of the water. That waste water could be used to turn a water wheel to generate a small amount of power.

1. Micro hydro generators on Amazon.

11.7 DC motor and crank generators

If you turn a DC motor using water, wind, by hand, or any other method, it will generate power. A similar type of generator is called a "dynamo". Dynamos are sometimes added to bicycles to generate power for headlights. You want a "brushed" DC motor.

The DC motor will have 2 connection points for wires. The polarity of the wires will be different depending on which direction you are turning the shaft.

Use a multi meter set on DC voltage, and turn the shaft in one direction. If you get a negative voltage, your multimeter leads are crossed. If you get a positive voltage, your multimeter leads are pointing to the correct positive and negative connections *when you turn the shaft in that direction*.

Above: DC motors come in a variety of sizes and can generate a variety of current and voltages. This might be a 775 DC motor.

Above: Dynamo on a bicycle. This one does not appear to touch the tire so it may not generate power.

There are many pages on how to make your own DC generator too.

Caution: Brushless motors often need a controller board to run and are more difficult for the beginner to use. I don't know how they work for generating power.

1. Some motors have a gearbox on them. If you get a gearbox that slows down the motor when it's given power, then when you turn the shaft the gearbox will *increase* the motor shaft speed, so this is what you want for more voltage.
2. If you have a motor with a gearbox make sure the gears are metal or they will not last long.

11.7.1 Sources of DC motors

A DC motor should have something to indicate it is a DC motor like "12vdc" or just "dc" stamped on it. To make your own generator, find DC motors in these items:

1. Crank flashlight.
2. Battery powered gadgets like a battery powered stirrer, fan, drill, jig saw, etc.

3. Any battery powered motor.
4. Jogging machine/treadmill.
5. Computer printers. DC motors are used to move the print head back and forth and to move the paper up.
6. Hard drives might have a small DC motor.
7. DVD drives have a tiny DC motor.
8. Battery powered toys like cars and trucks that move.
9. Battery powered drills and screwdrivers.
10. Computer fans or battery operated fans.
11. A hair dryer might use a DC motor for the fan.
12. A floor heater might also use a DC fan as a blower.
13. You can buy new or used DC motors on Ebay or Aliexpress.com. One model is the 775 DC motor.
14. A phone vibrator also is a tiny DC motor but may be useless except for proof of concept devices.
15. A small wind power kit for $5usd is also sold online for proof of concept.
16. Old portable electric razor.
17. Link to where to get DC motors.

11.8 Portable solar generator

This isn't a generator at all, it's just a battery bank combined with an invertor, a charge controller, and power outputs of various types. But they are usually designed to hook a solar panel to for solar charging.

1. Will Prouse has a forum and he does a lot of reviews of portable solar "generators" and components for solar power including batteries. He is highly recommended. https://diysolarforum.com/
2. Tiny DC generator you can hook to a US garden hose. https://smile.amazon.com/Water-Turbine-Generator-Micro-hydro-Charging/dp/B06XPRMPF5/ref=sr_1_67?_encoding=UTF8&keywords=hydro+power+generator&qid=1577891801&sr=8-67
3. Bathroom faucet with tiny DC generator. One might be able to charge a small battery with this. Amazon.

11.9 Thermoelectrics and peltier elements

Peltier elements work by generating DC power through a *temperature difference* between the 2 sides of the ceramic element. The problem here is keeping the temperature difference high enough to generate usable power over time. Thus many designs use a heat sink on one side to cool it, and a candle on the other side to heat it. But then the candle runs out.

These are also called TEG, for Thermo Electric Generator.

What if the heated side used a focused beam of sunlight from a lens? It would only work during the day but might be less work and less cost over all.

They work in the reverse also. If you apply DC power to the 2 wires, one side will get hot the other will get cool.

Here are some DIY ideas to make your own phone charge. Your design will need to include some type of voltage regulator that does not go above 5vdc and should use a USB cable.

1. Charge your phone using a candle. https://www.youtube.com/watch?v=yeGmSESIVcA
2. Charger using fire. https://www.instructables.com/id/Battery-Charger-Powered-by-Fire/
3. Thermoelectric battery charger. https://www.instructables.com/id/Thermo-electric-Battery-Charger/
4. Peltier campfire generator puts out 14 watts. https://hackaday.com/2013/01/10/peltier-campfire-generator-put-out-14w-kind-of/
5. 12vdc Peltier elements on Amazon. https://www.amazon.com/peltier-12v/s?k=peltier+12v
6. 107 best TEG generators. https://www.pinterest.com/ciprimoloci/thermoelectric-gadgets/

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12 Light

It's handy to have light when it gets dark. Light helps you to continue to work, or read a book, or simply to keep from stubbing your toe on something.

12.1 LED candles

These come in many sizes, do not generate heat, are safe if tipped over by a child or cat, and use many different battery types. Some have AUTO timers that reset each day. Ex: they turn on for 6 hours, turn off for 18 hours, and turn on at the same time again the next day, repeating forever. These also have an OFF setting, and always ON setting.

Some have remote controls. Some have colors that can be changed by a remote. The brighter the light, the faster batteries will be used up.

Pros:

1. Very safe, even if tipped over.
2. They do not generate heat.
3. They use little power so batteries can last a long time. However, larger batteries last a longer time than smaller batteries in general.
4. Some flicker like a candle.

5. Some come in a golden white light, or yellow.
6. Some even look like a flickering torch.
7. They can use a wide variety of battery types.
8. Can be bought at dollar stores.

Cons:

1. They use up batteries or the batteries must be recharged. If you are handy you can make your own battery out of various materials and an electrolyte, but a white LED requires about 3 volts of DC power.
2. Smaller batteries will not last as long. Use 1-2 D batteries for longer run time. Or use 18650 batteries.
3. They make no heat.

12.2 LED lights, AC or DC powered

There are many other types of LED lights. Some are shaped like lanterns, some like light bulbs which you can hang, some of which can be charged by solar power, or use a headlamp shining into a jug of water to spread the light.

A specially designed LED light can run on blink mode for 5 years, always on mode for 2 years (I have tested it myself). I have not seen these on any commercial sites though, these are usually custom made. See http://tindie.com if there are any there.

Pros: Same as LED candles.

Above: LED bucket light which uses mains AC power. They can also be made with a cordless, battery-powered LED light.

Links

1. Joule thief light runs on 1AA battery. https://www.tindie.com/products/sdp8483/multi-led-joule-thief-v2/
2. Multi-year Tritiled light runs on single coin cell. https://www.tindie.com/search/?q=tritiled+led+light

12.3 Wax candles

These can provide enough light and some smell nice. Tall candles in a glass jar, with a long burn time, are sold at the Dollar Tree for $1usd.

Pros:

1. They are cheap and mass produced and easy to find during normal times.
2. Some wax candles can fit into a hurricane lamp to prevent the wind from blowing it out.
3. Some can burn for 100+ hours. Like the tall religious candles at the Dollar Tree.
4. They can be made from beeswax or paraffin if you have it. For longer burning time, add 10% stearic acid to paraffin by weight.

Cons:

1. They can tip over and might cause a fire, so use a wide, heavy base, and keep the candle away from traffic areas and out of reach of small, curious children and pets.
2. When used a lot they can put a deposit of soot on your ceiling above the candle. To fix this, use a baffle, a piece of sheet metal, above the candle.

3. If the wick smokes, it's too long, trim the wick with scissors.
4. Wax can be hard to get out of carpet.

Hints:

1. If a taper candle does not fit in the holder, wrap tin foil around the bottom sides of the candle to make it wider. Or shave off wax from the sides of the base to make it smaller.

Above: Candle lantern of a good quality, like UCO, will have a spring to push the candle up to the right height automatically as it burns. Howerver, UCO candles are custom-sized and expensive.

Above: Here's a mug with a candle in it. When the candle is done burning, you can use the mug.

12.4 Kerosene lanterns

These run on kerosene, also called "liquid paraffin" in some countries.

Pros:

1. Kerosene generally not hard to find in the US.
2. They give a warm, golden glow with medium light.
3. JP8 jetfuel is a high quality kerosene. Found at airports.

Cons:

1. The burned kerosene can have a bad odor, even the unscented kerosene can have a faint smell which builds up over time.
2. They might leave soot on your ceiling if it doesn't have a baffle.
3. The glass covers can get soot on them and reduce light output.
4. You have to know how to trim the wick to keep it burning properly.
5. Improperly trimmed wicks may increase the bad odor.
6. They can spill of someone knocks it over.
7. Kerosene starts to convert to water after just a year. Kerosene older than 2-3 years may not work very well or not at all.

Above: Kerosene lamps.

12.5 Oil lamps

These can use any cooking oil to make light. Do not make the oil dish too deep or the oil will not travel up the wick. Before lighting, wet the wick with oil.

Pros:

1. Easy to make your own, if you know how to design it right.

Cons:

1. The container must be shallow. Oil can only move up the wick so far. Use only 1-2" deep containers.
2. Some oils can make your house smell like burnt oil.
3. They can be quite sooty.
4. Light is not that bright.

5. It can take a bit longer to light them with a match. Oil does not light right away as it has a higher combustion temperature.

12.6 Alcohol lamp

These are lamps with a wick which use alcohol to make a flame. The flame usually burns as a dull blue flame. Use 90% alcohol or more in them, 70% isopropyl alcohol might work in a pinch. They come in many sizes including the very small pocket size. These are essentially a metal or glass container with a wick.

Pros:

1. Alcohol easily found as methanol.
2. Can be used to cook food also.

Cons:

1. Blue flame does not make much light and is hard to see especially in the daytime.
2. Alcohol might leak from a container if you don't seal it correctly.
3. Alcohol may evaporate if the container is not sealed well.

12.7 Squeeze lights

These are lights where you squeeze a handle, to rotate a flywheel, which charges up a battery inside. They are handy since they will recharge as long as the battery will take a charge, and it only uses hand power. So you can charge it up real good and let it sit and rest for a few days.

Some are found at Dollar Tree in the spring. http://dollartree.com

Above: Dollar Tree squeeze light

12.8 Crank lights

These are lights with a crank that you turn to charge a battery.

Some of these charge a super capacitor but most super caps are self-discharging and it will discharge itself in about 20 minutes or so. They are fun but really, a bit impractical.

Above: Crank flashlight. Some have radios.

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13 Making charcoal

You can make charcoal out of many different organic materials, from grass, sticks, water lilies, weeds, coconut husks, bark, or whatever you have.

13.1 The process

The process you use is to burn the items in a metal barrel with only a small hole in it so gasses can escape. These gasses are flammable so they can be redirected via a metal tube to under the metal barrel to add heat to the process.

1. Burn the organic material until the flammable gasses are no longer coming out as strong.
2. OPTIONAL. Pour water on the material in the barrel to stop the burning. If you use water to put out the burning it will require time for the charcoal to dry.
3. Pour the charcoal into a metal bucket. Weigh the charcoal but exclude the weight of the bucket.
4. Take 10% of the charcoal weight and add that much in wheat, corn, or tapioca flour as a binder.
5. Mix well into a paste.
6. Paste is done when you press it into your hand and it doesn't leak water nor fall apart.
7. Press charcoal mix into molds. A mold with a jack is not needed, body weight will work fine for a mold. The charcoal that comes out has to be a little firm but not rock hard.

13.2 Charcoal mold ideas

Use 2 metal ice cube trays. Fill tray with charcoal mix, press top of tray 1 with the other tray to compress the charcoal mix. Remove the charcoal mix and let dry in the sun. Do not let it get wet.

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14 Packing list

So what supplies do you need to have at home? Supplies are determined by the conditions you will be in, but how do you guess what the conditions will be? You don't, you assume the worst and prepare for that: no heat, no water, no food at the stores, no power from the grid.

14.1 Water

Will you need bottles of water? How much will you need? A person needs about 1 gallon of water (minimum) per person, every day just for drinking. For washing plates and pots, and for washing themselves, they will need a lot more.

Do you have a water filter? Do you know how to use it? Do you have a source of unpolluted water? Than use that. For most people, they do not live near an unpolluted source of water in the US unless they live FAR away from any city, and upstream from the cities. Still, chemicals like formaldehyde can leak out of cemetaries to poison well water too.

Melted snow can also be used as water as long as it's clean. Use a CLEAN bucket to put snow in, bring it into the house where it's warmer, and let it melt.

14.2 For heat

1. Have enough fuel for your wood stove or wood fireplace.
2. Dress in warm layers. Include warm hats, socks, and gloves. Wear a hat at night if you are cold.
3. Have wool or down blankets for night time when temperatures could get below freezing.
4. Have fuel for any other types of heaters, like alcohol heaters.
5. Disposable heaters work well but can be used only once. See the section above for heat ideas.

14.3 Food

How much food do you want? How long do you want to survive? Get food for 30 days and that will cover most cases. But make a detailed daily list of food for each person, then multiply that by 30. Here are some foods that are easily stored without refrigeration.

1. WATER! Or at least have a water filter. Gravity water filters work well and do not need to be pumped by hand. Search for "gravity water filter". Get one with a 0.10 micron filter for best results.
2. Dry meats, like jerky and dry sausage.
3. Dry beans and rice. Just boil to cook it. Make sure to have some spices handy as the same beans every day gets old very fast.
4. Dried fruit.
5. Canned food. Make sure you have a can opener. Cans can be opened by rubbing them on a flat concrete surface too.
6. Granola bars and similar bar food.
7. Peanut butter.
8. Spices to keep the food edible and have some variety. Plain beans gets old real quick. Like: cajun spices, garlic salt, Lawry's salt, other flavored salt, potassium chloride for potassium.
9. Chicken or other boullion for flavoring rice, beans and other things.
10. Tea, coffee, hot drinks.
11. Dish soap to wash dishes. It's really important to keep clean and prevent disease.
12. Oxygen absorbers to keep stored food fresh. A whole new section could be written about food storage and how to do it.

Other supplies related to food you might need:

1. A grill to put on a wood fire to cook on. Never use pine wood to cook on, it makes the food taste horrible from the pine pitch.
2. Aluminum foil to put on the grill.
3. Can opener.
4. Church key. This punches triangular holes in a can, usually cans of liquid like liquid broth, or juice.

WARNING: Be careful cooking outside or with camping equipment, you could get burned. Never wear rayon near a fire, it's highly flammable.

14.4 Light

1. Candles of various types. Make sure they are in heat-proof holders.
2. Matches, lighters, etc.
3. Flashlights. LED flashlights have longer runtime with batteries. Bigger batteries provide longer runtimes.

14.5 Medical supplies

Make sure to have a supply of medical supplies like: bandaids, hydrogen peroxide for cleaning wounds, antibiotic ointment, anti-itch creme for bug bites, and normal prescription medicines for 30 days. Also:

1. Sun screen for the summer.
2. Burn cream, if you get burned, Silvadene is amazing stuff. It's called Silvadene or Thermazene in the US. It's on Amazon. Search: https://smile.amazon.com/s?k=silvadene&ref=nb_sb_noss_2
3. Will you need N95 masks for an epidemic?
4. What about rubber or other types of gloves?
5. Alcohol can be used to clean wounds and sterilize instruments. 60-70% alcohol is fine for this. High proof booze is good for this but an expensive source of alcohol.
6. Do you have enough vitamins? Preventing disease is *really* important in a survival situation.
7. Nuts like pecans, walnuts for Omega fatty acids, which help your immune system.
8. **Toilet paper**
9. Bactine or anti-bacterial spray for minor cuts and scrapes.

14.5.1 Specific to coronavirus

General idea: treat the symptoms, drink at least 64 oz of water every day, get lots of rest, stay away from other people, they might be infected.

1. Lots of anti-cough meds for the coughing.
2. Meds to bring possible fever down, like aspirin, Tylenol, ibuprofen, etc.
3. Vitamin C, zinc, Vitamin D, and echinacea to improve immune system. Take 8000 IU of Vitamin D each morning as soon as you have symptoms of flu.
4. Humidifier to ease coughing and asthma symptoms.
5. Asthma meds.

14.6 Entertainment

Things will get very boring with no power after a few days. What do you have to pass any spare time? Here are some ideas.

1. Paper books.
2. An old ereader will work if you can keep it charged via solar power or another method.
3. Board games.
4. A deck of cards.
5. Drawing or writing paper. Lined paper is good for making lists of things you need to make or find. Paper is also good for leaving notes for neighbors or family.
6. Markers, crayons, pencils, pens, paper.
7. Apocalypse bingo. As you see apocalypse items around you, close the shutter over the item. Sample items: zombies, burned out car, dead body, smoking ruins of a building, starving sheeple, raiders, dead raider, etc.
8. Any games for the kids.
9. Make up your own Pictionary. Have cards with a single word. Have 2 teams of at least 2 people each. One person from team 1 draws what's on the card and the other person from team 1 has to guess what the picture is.

14.7 Misc

1. Paper products like tissues, **toilet paper,** maybe paper plates, disposable silverware, disposable cups. Reuse plastic ware as much as possible. Minimize trash. Paper with food on it cannot be recycled.
2. Sewing kit for repairs.
3. Dental floss. It's strong and can be used to tie things and mend things.
4. Tools for fixing other things like screwdrivers (flat and philips at a minimum), hammer, pliers, wrenches.
5. Cash, to buy things neighbors might have?
6. Pocketknife. It has many uses for light cutting.
7. Flashlights and batteries. A solar charger for batteries is also handy but may not work well in the winter.
8. Candles and matches. Things to light a cooking fire. Make sure to have containers to keep the matches, and strikers, dry, do not rely on paper boxes.
9. Bleach, for purifying water and cleaning things.
10. Caffeine. What form? Caffeine gum is small and portable. Tea and coffee are light and do not need refrigeration. Some people have stomach problems and cannot handle coffee or tea and must eat caffeine gum.
11. Batteries? What kinds? How many?
12. Candles? Matches? Tealights?
13. Kerosene? Gasoline?
14. Garbage bags, for garbage and keeping other things dry.
15. Sharpie marker, for marking many types of surfaces from metal, to plastic, to glass.
16. Zip ties. Can be used to attach things to other things so they don't get lost. They also sell reusable zip ties.
17. Carbide etcher pen. This can be used to etch a code number on an item to recover it if it was stolen, or simply to identify the item as yours.

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15 Medical help at home

1. Download free "Where there is no doctor". Medical advice for primitive situations.
    1. Original site, single PDF is no longer free but each chapter PDF is free. https://hesperian.org/books-and-resources/
    2. Alt site: https://www.researchgate.net/publication/236310352_Where_There_Is_No_Doctor
    3. 2011 version: https://www.burmalibrary.org/docs12/Where_there_is_no_doctor-2011(en)-red.pdf

15.1 Important supplies

1. 4x4 bandages and the tape to keep them on the person. You can use clean, old neck ties to bind the bandages on there too in some cases. Rope or string will put too much pressure on a small area, in general.
2. Vitamin D and zinc for the immune system.
3. Get a first aid book. Learn how to stop bleeding at the very least.
4. Ibuprofen and Advil (naproxen sodium) thin the blood and cause more bleeding. Do not use if you suspect internal bleeding.

15.2 Insect bites

1. Put toothpaste on insect bites to relieve the itching.
2. To relieve poison ivy here are different tips: put apple cider vinegar on it. Put a baking soda paste on it. Put aloe on it (do not use a gel with alcohol). Wash with a soap with lavendar and rosemary. Try using witch hazel.
    1. To treat poison ivy exposure: Crush leaves of jewel weed and put on the site as soon as you think you have had poison ivy exposure. I normally will not say "cures instantly" unless I tried it myself, but I tried this myself, and it does work in seconds. Jewel weed grows in the same area as PI. That is, areas on the edge of river banks, or edge of swamps, that tend to be moist, but not wet, and partially shady. Crushed jewel weed leaves also treat nettle stings.

16 Radios

Attach a single wire to an FM radio antenna and run it outside your window to a high location. This will greatly improve reception. The wire can be enamled, coated with vinyl. Just remove the enamel or vinyl at the point where it connects with your radio antenna, the wire must be bare at the connection point.

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17 Links

17.1 Online stores to buy products in the US

1. http://amazon.com. Mar 18, 2020: Amazon will now prioritize important products to ship first like baby formula, food, etc.
2. http://ebay.com
3. https://www.sportsmansguide.com/. This used to be an inexpensive alternative but they eventually got fairly expensive. Their prices are the same as retail now.
4. Local military surplus stores.
5. Prepare with X22. Food in buckets and more. https://mypatriotsupply.com/pages/rs-repdig-4-week-emergency-food-supply-x22-report-may-2020?rfsn=1750310.2a7b74&subid=x22.report

17.2 Emergency status sites, weather, power, internet, etc

1. Power outages in US. https://poweroutage.us
2. Is Discord down? https://downdetector.com/status/discord/ Recent outages at https://downdetector.com/archive/.

17.3 Misc DIY sites

1. Instructables. http://instructables.com. A great site for DIY ideas and step-by-step projects.
2. Info on stoves and CO and CO2 and variables affect that. Archived site: https://archive.is/Vwlyl. Updated page should be here: http://bushwalkingnsw.org.au/clubsites/FAQ/index.html
3. Zenstoves.net. LOTS of great information on using, making stoves, using fuel, fuel efficency, etc. It focuses on using backpacking stoves. http://zenstoves.net/
    1. Zenstoves page on CO (carbon monoxide) studies. The page gets fairly technical. http://zenstoves.net/COHazard.htm
4. Youtube. Has reviews on camping and other related equipment. https://youtube.com

17.4 Misc sites

1. FEMA in the US. Federal Emergency Management Agency. https://ready.gov/cert. Citizen volunteer group in the US who will tell you the real story, do not count on the gov't to get the truth.
2. Where There Is No Doctor book. Free medical advice in primitive conditions. https://hesperian.org/books-and-resources/ You can download 25+ PDF files for free or purchase the full single PDF download which currently costs $26.95usd.
3. For sources of studies, free ebooks and PDFs, go here: https://pastebin.com/2vGVq05X.

17.5 Sources for more help

1. DDG image search. Using a DuckDuckGo.com image search is also a good way to find ideas. https://duckduckgo.com
2. Pinterest. Pinterest has good ideas in picture format. And if you sign up for a free account you can save pictures in online folders. https://pinterest.com.
3. Survivalist Boards forum. https://www.survivalistboards.com/. Nice experienced people to help you out and provide ideas. This forum has been around since at least 2009.

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18 Bucket o links

18.1 Heat

1. A search for flowerpot heater designs from Pinterest. https://www.pinterest.com/search/pins/?q=flowerpot%20heater&rs=typed&term_meta[]=flowerpot%7Ctyped&term_meta[]=heater%7Ctyped

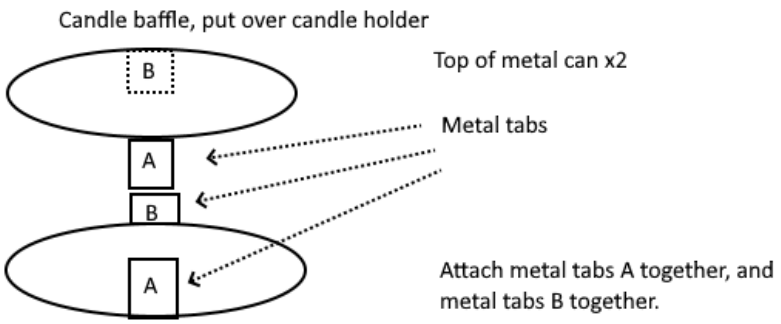
18.2 Light

1. NOTE: a Crisco or light that burns fat, may smell like burning oil, or make lots of soot. Test one and burn it before you make too many.
2. Use a canning jar to put the Crisco in as they are heat resistant. Other jars are not heat resistant and may break. Other jars that may withstand heat: jelly, hot fudge for ice cream.
3. SAFETY:
    1. Never leave an open flame unattended. Do not use an open flame when you sleep. Put at least 2-3 feet of space between the open flame and something above it, or use the candle or flame in a candle lantern with a metal top.
    2. Only put candles or grease in metal or glass containers *rated for heat*. Never use aluminum, it could melt! US soda cans are aluminum and melt easily in a camp fire.
4. **Make a Crisco or fat candle.** https://www.theorganicprepper.com/how-to-make-a-crisco-candle-safely/

5. **Make an oil candle.** 1) Take a normal candle wick. 2) Take a METAL bottle cap. Punch a hole in the bottle cap and thread the wick through it. The wick MUST float on top of the oil to work. 3) Fill a jar with oil and dampen the wick with oil. 4) Light it. It might stink but it will work.
6. **Candle holder:** Take a normal can, starting 2" from the bottom of the can punch holes in the side. There are no holes in any lower than this in case the candle burns quickly and fills up the can with wax. Put a taper candle in. To stick it to the bottom, melt the wax of the bottom of the candle and stick it in. It's ok if
taper candle may be taller than the can.
7. **Candle baffle:** A candle baffle is put above the candle. It is made of 2 layers of metal seperated by about 1/2 inch of space. The heat is trapped by the later closest to the candle so the upper layer does not get too hot. A baffle will also trap any soot from the candle so it will not build up on a surface above it. A handle can be attached to the upper layer of the baffle and the handle should not get too hot. Use rivets or sheet metal screws to attach the 2 parts of metal together. Sheet metal screws are pointy and sharp to penetrate the metal. Self-tapping metal screws will not need a hole drilled for them.

Candles can be made several ways. Some containers to use would be a metal can, or glass jar rated for heat. Canning jars would work fine as well as hot fudge jars or jelly jars, or an old candle jar.

Fuel for a candle can be wax (from crayons, old candle pieces, etc), fats (like Crisco or oil), vaseline (petroleum jelly), grease from cooked meat, wax covers from cheese, or even butter. But do not leave the butter out for too many days or it will go rancid and stink. Jelly candles are made from some type of gelled oil and may have a slight bad smell when burned. They will also produce more soot.



A candle baffle

18.2.1 Securing a candle wick to the bottom of a jar.

If you are making your own candles you must secure the wick to the bottom of the container before pouring in the hot wax. Here are some options for doing that.

1. Use silicone caulk. Make sure the caulk cures solid before putting in oil or melted wax. This may take 3-4 hours.
2. Use poster putty or "sticky tack".
3. Use double sided foam tape.
4. Will superglue work?

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19 Log of changes

1. 2020-01-28. Added under "heat and warmth": disposable hand warmers, charcoal hand warmers, electric hand warmers, catalytic hand warmers. Updated these sections: DC Motor. Updated some image captions.
2. 2020-02-28. Added section on generating power with Peltier elements and heat.
3. 2020-02-29. Reduce size of images by decreasing color depth to save bandwidth.

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