

# Lancaster Stake Personal and Family Preparedness Class

## "EARTHQUAKE PART 3...LIVING AMONGST THE RUBBLE"

### Tools, Fuels and Fun

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Presented by Debbie Kent

Peaceofpreparedness.com

A Special THANKS to Kylene at yourfamilyark.org; Vicky Godley; and my friends at ldsavow.com; for sharing your talents and information with me; and to my family who gives up their time with me so that I can help others get prepared.



*"Fathers (and Mothers), another vital aspect of providing for the material needs of your family is the provision you should be making for your family in case of an emergency. Family preparedness has been a long-established welfare principle. It is even more urgent today. I ask you earnestly, have you provided for your family a year's supply of food, clothing, and, where possible, fuel? The revelation to produce and store food may be as essential to our temporal welfare today as boarding the ark was to the people in the days of Noah."*

"Sacred Roles of Fathers and Mothers", Ezra Taft Benson, Ensign Nov. 1987

## EARTHQUAKES PART 1 AND 2



In Part 1 and 2 of our Earthquake classes we have discussed what to do before, during and in the first few days after an earthquake or other major disaster. We talked about what kinds of disasters, both natural and man-made, we might have to face here in the Antelope Valley. We talked about how you cannot depend on police or fire fighters to come to your rescue; you only can depend on yourself and what you have stored. We also discussed how there are many things you can and should do to prepare your homes and your family BEFORE a disaster to minimize damage, fear and injuries. We talked about the importance of CERT and first aid training. Last month we also discussed the need to have things for shelter, sanitation and water. But we can't stop there. Tonight we will be discussing: the kinds of tools and supplies you might need for repairs and clean-up; lighting, heating and fuel options and also FUN, the importance of planning for boredom. So let's get started...

## TOOLS

In the first few days following an earthquake or other disaster you will be taking care of your survival needs. This could be things like: injuries, shelter, water, food, cooking and sanitation. But once those things are taken care of you may need to do clean-up and basic repairs, either for yourselves or for your neighbors. The following are some types of supplies that would be good to have around.



Chainsaw and fuel: This would be a great tool if you need to cut up downed trees and also to cut up firewood. Gas saws and fuel will work even with no electricity.



Crowbar: For use in opening jammed doors and windows. Keep one next to your bed.



Duct Tape: Can be used for anything from fixing broken glasses to prom dresses. One of the most versatile pieces of repair tools in the world.



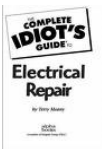
Electrical Supplies: When an earthquake strikes, many electrical things may break or be damaged. Wouldn't it be great if you had supplies ready at hand to fix these? This could include: extension cords, outlets, wire, wire cutters, crimpers, light bulbs, switches, etc.



Fire Extinguisher: After the initial earthquake, fires are usually the next cause of destruction. Get the proper type fire extinguisher for your circumstance, know how to properly use it (/CERT training) and keep it up to date and in an easy to find place.



Hammer and Nails: Repairing various items, including: boarding up broken windows, Fixing fences and gates, holes in roofs and walls, building outhouse, etc.



How-to-Books: Pick up online or garage sales for great prices. Great for step-by-step directions on how fix electrical or plumbing or roofing or a big variety of other problems when experts aren't around or you cannot afford them. Don't forget to stock the supplies you will need to make the repairs.



Ladder: For trimming trees, fixing holes in roofs, drying clothes, making shelves, etc.



Lattice Stakes: Found at Home Improvement stores, used to install lattice. Can be used to secure plastic sheeting around windows and on roofs.



Plastic Sheeting: Found in home improvement and paint stores by the 100 foot roll. It comes in clear and black. You will want to get 4-6 mil (thickness). It can be used for broken windows, holes in roofs, sealing rooms (biological attacks) or for isolation rooms (pandemic)etc. Cost \$45.



Plumbing Supplies: Supplies you would need if your pipes broke inside or outside your home. These could include: pPiping for indoor and outdoor plumbing, wrench, pipe cutters, teflon tape, connectors, etc.



Plywood: Could b used for boarding up windows and doors, fixing holes in roofs and walls. To make temporary shelters, etc. Also saws to cut the wood.



Redwood Plugs: found in home improvement stores. Used to temporarily stop leaks in water or gas pipes until supplies can be cut off at source and repaired.



Rope: Tying things down or together, making a shelter or port-a potty room or even a clothesline.



Screwdriver and Screws: Screws hold better than nails. Can be used in boarding up windows, fixing doors, furniture and a variety of other uses.



Shovel: For digging holes for trash and human waste, moving debris, gardening, and even burials in extreme cases.



Tarps: For use under tents, over tents in extreme weather, covering holes in roofs, making a temporary shower/toilet room, etc.



Utility Turn-off Tool: Used to turn off your gas meter and some water meters. **Hint:** Only turn off gas at meter if you see, hear or smell gas.



Wheel barrel: Used for: hauling away debris or dirt and even for a make-shift barbecue pit.

## LIGHTING, HEATING AND FUELS

**What will you do when the lights go out?** We are spoiled by the wonderful convenience of electricity. It powers our world and we are dependent upon it. When we find ourselves without power, our world comes crashing down around us.

This class is to get you thinking about how you would do these things WHEN the power goes out. What will you do if there is a powerful storm, earthquake, freeze, energy crisis, financial collapse or even an EMP?? Power outages can last anywhere from a few seconds to a week, month or more. When it happens, will you be able manage at home or will you have to relocate until the crisis has past? In case, leaving is your only choice, do you have a place to go?

*Ezra Taft Benson said, "As families we should strive to be self-reliant. Since 1936, members of the Church have been instructed to have in storage a one-year supply of food, clothing, and, where possible, fuel. This enables us to survive loss of employment, loss of income, or even calamity, as spoken of in the revelations." "Strengthen Thy Stakes", Ensign, Jan 1991, pg.2.*

We are going to concentrate on ways to: light, cook and heat and some of the fuels to power these devices up. There are many different options for each of these, literally thousands of them can be found; on the internet or locally. ***I am not endorsing any particular brands or devices. Each family and circumstances are different. Only you can decide what will work best for you.*** But this I can say, Finding **several ways** to provide light, to cook and to keep your family warm, now while the lights are still burning bright and knowing where they are and how to use them, will make all the difference in the world in how your family will react when the power does go out. Will they be afraid or will they find joy in the moment?

The first thing you need to do is make a list of what your family's needs are. Does your family have small children, grandparents, sick members or are they mostly grown and healthy? What will you be cooking? How will you cook it? How cold does it get where you live and for how long? How big of an area will you need to heat? Is your house new or old, does it have good insulation? What about lighting? Will you be going to bed soon after the sun goes down, or do you have a late night family or one with little children that need night-lights? Then look at what you already have and can use to do these things. So if you have a ton of wood and a wood burning stove that you could use to heat and cook on you may not need anything in this area. What about lighting, do you have lanterns, do you have fuel for it and extra mantels if needed? Do you think you have pretty much everything you need or are you starting from scratch? Wherever you are there is room for improvement, so let's get started with finding out what there is out there to fulfill your family's needs.

### LIGHTING

When the power goes out having alternative sources of lighting will be invaluable. There are many different ways to light up the darkness; it would be wise to have several different kinds of lighting available to you. For instance, you will want something to light up part or all of a room like lanterns and something else that gives a bright beam of light to a specific spot like flashlights. All lights are not created equal. You want to find a combination of bright light that lasts a long time with little use of fuel (batteries, etc). Hint: putting white sheets on your walls will make the room brighter by reflecting the light. The following are some ideas for lighting. They are listed in alphabetical order and not by order of importance.



**CANDLES:** There are many different forms of candles available. Candles provide a soft, low light. Candles are cheap and easy to obtain and to store. The open flame presents a fire hazard and does consume a small amount of oxygen so use with care. Candles have an indefinite shelf life. Store in a cool place.

3/4" diameter x 4" burns about 2:20 hours

7/8" diameter x 4" burns about 5 hours.

2" x 9" burns about 75 hours

Tea light burns 2-4 hours



**COOKING OIL:** Emergency candles can be made from cooking oil. Take a piece of string, lay one end in cooking oil and allow the other end to hang over the edge of jar. Light the dry end. Use 7-8 stings for more light. These are very smoky and should be used only when nothing else is available.



**ELECTRIC LANTERNS** – These are nice for general lighting. They are available with florescent or LED bulbs which make the batteries last much longer. They are usually battery operated but there is also a hand crank model available with LED bulbs that claims to last for 20 minutes after 60 seconds of cranking. They are usually not very bright and do require stopping every 20 minutes or so a crank it up again. Small versions (\$5 at Wal-Mart) are a great idea for small children.



**EMERGENCY CANDLES** (also called 100 hr candles): They come with a plastic base that is filled with liquid paraffin. It is smokeless, odorless, and has no hot wax to make a mess. It may last for over 100 hours. It stores 10+ years.



**FLASHLIGHTS:** When the lights go out the first thought is to reach for a good flashlight with fresh batteries. They provide a quick, reliable source of light and are available in a wide variety of shapes and sizes. A 2-battery flashlight with new batteries will work for @ 6 hours. For long-term storage: don't store batteries in flashlights. Store extra batteries and bulbs. No matter which kind you decide to buy, make sure that you buy quality. The cheap ones break easily and would be of no value in an emergency.

### **What to look for in a flashlight** (adapted from survivalblog.com)

1. Small and lightweight: They use fewer batteries and can be carried in a pocket.
2. Use a common battery size: Most use: AAA, AA, or D cells. Smaller charge faster.
3. Uses a variety of battery types: alkaline, lithium, or rechargeable batteries
4. Fewer batteries is better: fewer used=fewer to store
5. Simple to operate
6. Well constructed: Bulb protected, shock resistant and water resistant/proof, and that won't accidentally turn on while in your pocket or backpack.
7. LED/Cree bulb: Lasts 10,000 hours, shock resistant, brighter than traditional bulbs.

8. Good compromise between output and run time: 8-12+ hrs per battery/charge
10. Quality of light beam: wide beam vs. bright spot. What do you need it for?
11. Lanyard hole/clip: Loop w/cord or ring to attach to you to prevent accidental loss.
12. Caring for your light: Unless using lithium's, don't store batteries in flashlight.

### Resources

1. The best flashlight resource on the Web is [candlepowerforums.com/vb](http://candlepowerforums.com/vb)
2. One of the better flashlight review sites is [FlashlightReviews.com](http://FlashlightReviews.com). It's no longer updated regularly, but many of the lights still being sold are reviewed at the site.
3. Great deals on flashlights and batteries: [dealextreme.com](http://dealextreme.com)

### Kinds of Flashlights



**Cap Light:** Very light weight and fits the bill of a baseball hat easily. The flashlight function works by press a switch once for 3 lights, again for 5, again for flashing, and again for off. Decent lighting for hands free work. It uses 2 lithium batteries and will run for 120+ hours.



**Crank flashlight:** Light lasts about 30 minutes on 1 min. cranking. Okay light, most have bonus of charging cell phones: 3 minutes winding-eight minutes talk time. (Doesn't fit all phones). Not waterproof or long lasting.



**LED flashlight:** Use LED bulbs which last a very long time. They burn brighter than the old style bulbs. They also use very little energy and so burn for a very long time. The Flashlights come a variety of styles, sizes, brightness and durability.



**LED headlamps:** take very little energy and they leave your hands free to work. Some headlamps last for up to 200 hours on 3-AAA batteries. These is one called an e+LITE by Petzl that works well even in extreme cold, runs for 45 hrs on one coin sized battery w/ a 10 year shelf life (\$1), compact and light, and has low and high lights.



**Rechargeable flashlight/automatic night light combination.** It plugs in the wall and functions as a nightlight, but when the power goes out it is a fully charged flashlight that automatically turns on. It is easy to find and always ready in an emergency.



**Shake flashlights:** These are magnet flashlights. They use an LED for light so they never need bulb replacement. Shaking the light charges the capacitor which powers the LED. If they haven't been used for a while you will need to shake them for 2-3 minutes. Even then most give a fairly bright light for 20-30 seconds and then get very dim. They are fairly waterproof. But not a reliable flashlight for emergencies. NOTE: DO NOT place near TV, monitor, floppy disks, hard drives, credit cards or wallet.



**Solar Powered Flashlights-** Eight hours of sunlight will provide 4-6 hours of usage on high. Some models will even charge well on cloudy days. This model by BOGOlight.com claims to work up to 20 years, is water and shockresistant, has a carry hook and 6 LED bulbs. Cost @\$26

## LIGHTING CONTINUED



**KEROSENE LANTERN** - A kerosene lantern with a one-inch wick will burn approximately 45 hours per quart of kerosene. A kerosene lantern uses one fourth as much fuel as a gas lantern. The light is comparable to a 40W-60W light bulb.. Kerosene does produce some black smoke when burning. Burning 5 hours each day the following amounts of kerosene would be used: @1 quart per week, 3 ½ qts. per month, 10 gallons per year.



**LIGHT STICK** – A plastic stick about four to six inches in length that come a variety of colors. To activate the stick, you bend it and shake. Depending on the brand, it will provide a bright colored light for 6-12 hours. It is windproof, weatherproof, does not create sparks for flames, and is safe for all ages. It may be purchased at most sporting goods stores. It has a shelf life of up to four years. These are the safest form of indoor lighting in case of an earthquake or other situations where flammable gasses may exist.



**SOLAR LANTERN**– There are a few different solar powered lanterns available. Some may be charged with 24-30 hours bright sunlight, an auto adapter, or a UL listed house adapter. Each model is just a little bit different. A full charge may supply up to 3 hours on high depending on the model.



**SOLAR POWERED LIGHTS:** They are commonly used along garden walkways. They are relatively inexpensive, are weather resistant and can be brought indoors in the evenings to light up the house.



**TWO-MANTLE LANTERN** - These are available in propane or “Coleman” type fuel. This is a good old camping favorite. The light is adjustable, gives off heat, and needs ventilation. White gasoline or Coleman fuel produces carbon monoxide and should never be used inside. Burn time for 1.26 pints of fuel is approximately 14 hours on low and seven hours on high. Coleman fuel stored in an unopened container in a dry place with a stable temperature has a shelf life of five to seven years. An opened container in the same area should be used within one to two years. Use caution when storing the fuel and using the lantern. Do not use indoors. They are also available in a multi-fuel design: unleaded gas, kerosene, or white gas.

## Cooking

*“In August of 2005, our family had the privilege of experiencing Hurricane Katrina. I say a privilege because it gave us the opportunity to experience a natural disaster and to learn lessons about emergency preparedness that we wouldn’t have otherwise learned. I want to share some of these lessons so that others may also glean knowledge from what our family went through...One thing to consider is how you are going to cook your food. We quickly found that eating cold food out of a can was quite unappetizing, even if you are hungry. We were under a fire ban, so building a fire wasn’t an option. I highly recommend learning ways to cook without electricity and storing needed supplies”. Jessica J. (yourfamilyark.com)*

**Alcohol Stove:** Reheats foods quite well in small portions, you may need to use more than one at a time for larger portions or to heat faster. Use lid whenever possible to increase efficiency. There are many homemade varieties of alcohol stoves, such as Stove-in-a-Can, as well as commercial ones available. Alcohol (in its pure forms) may be used indoors because it burns clean. However, use caution as some forms may be toxic and need ventilation. If you are going to use indoors make sure there is a **working carbon monoxide detector!**



**Applebox Oven: DO NOT USE INDOORS** This is one of my favorite ways to cook when there is no power, an applebox oven. It is simply a box that apple’s come in covered inside and out with heavy-duty aluminum foil (mine is the deluxe model with a window). All it needs is a few pieces of charcoal to turn it into baking machine capable of cooking anything you would cook in an oven and in the same amount of time. It is quick, easy and cheap. A great addition to your cooking without power needs.



**Butane Stoves:** These stoves are lightweight, convenient, and easy to use. They provide a nice hot flame and many come with an automatic - electric ignition and provide excellent flame control. They are light and more portable than liquid fuel stoves. Butane does not work well at near-freezing temperatures. The fuel is fairly expensive. One 8 oz. butane canister will provide 1-2 hours of burn time at maximum output. Shelf Life 8 years. Store carefully, fuel is highly flammable.



**Camp Stoves:** This camping favorite (red tank) runs off of “Coleman” fuel or white gas or propane which are inexpensive and widely available. There is a “dual fuel” design that will also run off of unleaded gasoline (gray tank). These stoves are dependable and easy to use. They produce a nice hot, even flame and is great for camping or emergency use outdoors. Also available is a single burner stove. It is a great emergency stove. It is lightweight and portable. Best of all, it can safely use Coleman fuel/white gas, unleaded gasoline, or kerosene.



Two pints will burn for about two hours with both burners on high. Remember that white gas or “Coleman” fuel and propane produce carbon monoxide and should never be used inside. Use caution when storing the fuel and using the stove.



**CANNED HEAT:** Stores easily and can be used indoors. Cans are filled with forms of alcohol. It puts out a flame and a good amount of heat. They are safe, lightweight, store nicely, and great for reheating foods. Burns 2-6 hours per can. Can be used in a small Sterno stove, chafing dish, or fondue pot. You can cover flame partially with lid to slow cooking down or use more than one can at a time to heat things faster or hotter. Sam's Club carries a very good one that provides 6 hours of fuel for only \$1. Store in cool place. To extinguish, cover with lid. Stir food frequently to prevent burning. Stores 10 yrs.



**Dutch Oven** (see "No Power...No Problem" handout for complete info) Dutch ovens are big, heavy cast-iron pots with lid. They incredibly versatile and can used to cook: breads, main dishes, and desserts. You can cook with them over an open fire, in a buried fire pit, in your oven, over our stove burners, over coals or using briquettes. They work as frying pans, pots and ovens. They come in many sizes: Important: Tight fitting lid with rim and legs (to prevent burning). You can cook pretty much anything. No need to wash (scrap, cook, oil). Food tastes fantastic. Dutch Ovens Last Forever. Before using the first time you will need to season your oven.



**Cook and Carry System** by Thermos Nissan

It works like a hay box using modern technology which makes it super simple to use. The pot holds 4.7 quarts. The manufacturer guarantees heat or cold retention for 6-8 hours. It has TherMax double wall vacuum insulation for maximum temperature retention. Unbreakable stainless steel interior and exterior. Great for soups, chili, beans, and stews.



**Ice Box Cooker:** Like using a crock-pot with no electricity. Secret in is the insulation. You just bring your meal to a boil in a pot, cover with tight-fitting lid, turn down heat and simmer on medium for 3 minutes (exception beans 10-15 min) then quickly put in cooker, cover with topper and leave for 4 times the usual cooking time. Food can be left up to 6 hours and still be hot and delicious. It is perfect for foods that start out with lots of liquid: soups, stews, rice, and more. For safety food must stay above 150°, if it drops below that; remove, reheat, and

replace.



**Kerosene Stove:** It is basically the same wick you would see in a large kerosene heater. This is a sturdy stove with an easily adjustable flame and a sealed fuel tank (some stoves have fuel "pans" that hold the fuel, but tipped, the fuel can spill out.) The Sockwick will burn for 13 hours on one gallon of kerosene. The maximum output is 9000 BTUs. Use only in a well-ventilated area!



**MRE Heaters** are designed to heat Meals Ready to Eat (MRE) meals quickly and safely without a fire. You can also heat up other foods that are water tight and small enough to fit in the bag. They are made from powdered food grade iron, magnesium, and sodium. When water is added to the chemicals in the heater it creates a chemical reaction that heats up almost instantly. It takes about 10-15 minutes to heat up food in an MRE. These are great for 72-hour kits.



**Portable grill** with legs can be placed over a small fire or charcoal briquettes. It makes a good cooking area. Food may be cooked directly on the grill or in pots and pans over the hot coals. The grills are inexpensive (\$10-15) and widely available.



**Propane stoves** are great for camping and outdoor cooking. They are great for emergency cooking ... an added bonus! Propane cooks hot and fast.

One 20 lb tank of propane may provide up to 15 hours of cooking time. The shelf life on propane is nearly indefinite. The tanks, however, need to be closely watched for signs of rust, dents, or anything, which may present a problem with leakage. Use in a well ventilated area and store fuel carefully away from the home.



**Rocket Stove** (complete info. in "No Power...No Problem" handout) Made from a 5 gallon metal can, stove pipe and a soup can: this stove will cook a full meal with just a handful of twigs. It makes very high heat (regulate heat by amount of fuel). Great for bringing food to a quick boil. Can is filled with insulating material (ashes, etc). It burns so hot there is very little smoke. It is amazing! Outside cooking only. Will make pots black.



**Solar Cooking** (complete info. in "No Power...No Problem")

This type of cooking only needs the sun and works equally well in the summer or winter. It works by harnessing the power of the sun's rays. You can cook anything with this method, it just usually takes a little longer than with traditional methods; you can even sanitize water with it. It is easy to use; although practice makes perfect, and very satisfying, because you don't need anything fuel but the sun. They range in price from a few dollars for the simple to the hundreds for the deluxe, such as the Global Sun Oven.

**Solid fuel tablets** such as trioxane fuel bars or Esbit fuel tablets are great for emergency kits. They are designed to work in a pocket stove. They are non-explosive, portable, smokeless, and light easily. They should only be used outdoors and are not good for cooking large amounts of food. One tablet will generate 1400 degrees of intense heat for 12-15 minutes of useable burn time. It will bring one pint of water to a rolling boil in less than 8 minutes. They are safe, easy to store, and have an indefinite shelf life.



**Volcano Cook Stove** is a wonderful emergency preparedness tool. It will cook just about anything and can be used as a safe fire pit. The Volcano Cook Stove is incredibly efficient, requiring one-half of the charcoal required for standard Dutch oven cooking. This stove can burn virtually any type of fuel. Scrap 2x4s, firewood, commercial logs, or scraps of wood will do just fine. It has almost no exterior heat at the bottom or sides making it safer to use.



## Heating

When the power is out in the dead of winter, the first thing you need to do is layer on the clothes, hats and gloves. If it is really cold, you can all pile into one bed and layer on the blankets. But let's face reality you are going to have to get up at some point and make some food or to the bathroom. Then you will probably want it be above freezing. It is not practical to think of heating an entire house, but heating one room, now that is do-able. Even having everyone in one, well-insulated room or tent can bring the temperature above freezing. Some other things to consider. Stay in a room on the south or west side of the house with as few windows as possible (basements. Cover the windows with heavy blankets or plastic and close the vents. You do want some fresh air so don't over do it.



**COAL STOVE:** Can be used as an alternative to wood, in fireplaces and coal-burning stoves or furnaces. 6 tons of coal will provide heat for an average Utah home through a normal winter. You can use in wood burning fireplace if you make a grate to hold the coal and allow air to circulate.



**FIREPLACES:** Have a cute decorate fireplace? It won't keep you warm when the power is out. Even conventional wood burning fireplaces are not very efficient. More heat goes up the chimney than into the room. But it is better than nothing. You can get heat-powered fans to place by it to better circulate the hot air into the room. Also, remember to clean chimneys regularly to prevent chimney fires.



**KEROSENE HEATER:** Kerosene heaters require good judgment and practice. Burning 5 hours each day the following amounts of kerosene would be used: @1 quart per week, 3 1/2 qts. per month, 10 gallons per year. Two 55 gal drums can provide heat and cooking for a family for one year. Kerosene does not explode. Carefully follow the safety instructions for all kerosene appliances. They do use oxygen and must be ventilated.

**There are 4 downsides to kerosene.** Because kerosene produces deadly carbon monoxide (a poisonous gas), nitrogen dioxide (which may cause throat and lung irritation), and sulfur dioxide (which can impair breathing) it must be vented to outside or have a window cracked in the room, 1" per 1000 BTU's (ex. 23,000 BTU heater needs a 24" window opened 1"). It burns VERY HOT (320°-500°). Must be on non-flammable surface (tile/cement board) and kept 4 feet away from flammable materials (furniture/drapes, etc). Fire danger if tipped over while in use. (Newer models have safety for this). Refuel and light outside to avoid smell. Never fill lamp/heater near top, expands and can spill and burn. **Hints:** Buy one with a wick; safety shut-off, push-button start; UL tested; not easily tipped over; also a carbon monoxide battery operated detector is a must; keep firefighting materials close at hand.



A **good wood-burning stove** may be used for cooking and heating. Wood is safe and easy to store. It will really heat up the house so don't use in the summer months. Cooking on a wood stove takes longer than some other methods as the fire must be started and managed. Cast iron cookware works best, but heavy steel will do also. It is easy to scorch foods with thinner metals. Always be sure that the stove is ventilated properly. Carbon monoxide is produced when wood is burned.



**Pellet stoves** work well, the pellets take up less storage space, and these stoves are very efficient and the cost is reasonable.



**Propane Heater:** Certified safe to use indoors. Mr. Heater: 18,000 BTU/HR; heat up to 400 square feet of space; up to 110 hours with 1- 20 gallon tank of fuel (on low position). Combines radiant heat w/ convection heat for maximum heating efficiency. Heat settings of 4,000, 9,000 and 18,000 BTU/HR control comfort level. Built-in oxygen shutoff sensor and tip-over switch ensures indoor safe operation



**Rubber Tires:** Can be cut up and used in an emergency. They are more energy-efficient than coal but are bulky to store and cause A LOT of black smoke. You can use power tools to cut them up, if you have power to use them.

## POWER SOURCES

### Why store fuel?

It is a cold winter day. A winter storm has knocked out the power and officials say it may be days before it is restored. You are prepared: you have flashlights, lanterns, stoves and even a heater, but alas you have no power sources to fire them up! Kind of like being up a creek without a paddle isn't it? There are many different choices in batteries, fuels and even solar. It requires some education to understand possible options, how to safely use them, and how to store them appropriately. I cannot stress enough the importance of using wisdom in your use and storage of fuels! Place the safety of your loved ones at the very top of your list. Be wise (don't do stupid things)! Never store any flammable or combustible fuel in any building that you can't afford to have burn down!

***How Much to Store?** Well, the Prophets have been very clear, that if possible, to have a year supply of fuel. (to me this means where it is legal to have it and where you have the room-if you have a yard, you have the room). Don't feel like you have to go out and get it all at once (if you can GREAT!), if not just begin it is important that you are doing everything you can do to fulfill this commandment. Start with a week or two and build from there.*

Can you really store enough fuel to last a week, month, or even a year?  
Can it be done safely and cost effectively? Absolutely!

### How to Store Liquid Fuels:



- Store your fuel in a small shed. Not in garage and NOT in your house.
- Keep your fuel storage as far away from your house as possible.
- If possible, keep your shed in a shady area.
- Make sure you lock the shed to keep children away.
- Store a fire extinguisher nearby but not in the shed.



**ALCOHOL** (ever wondered the differences in them, I sure did)

Denatured Alcohol (grain alcohol w/ toxins not drinkable) - is inexpensive and available in the paint section of hardware stores. Good choice for alcohol stoves such as Stove-in-a-Can and backpacking stoves. Burns hotter and less smelly than rubbing alcohol.



Pure Ethanol (potable grain alcohol) - is expensive and available in liquor stores and is sold under the brand names of Everclear and Graves Grain Alcohol. Burns really well in an alcohol stove.



Rubbing Alcohol (isopropyl alcohol) - is 70% isopropanol and 30% water. It has all the problems associated with burning pure isopropanol (burns yellow, sooty flames, indicating that it is not combusting completely) with the added inconvenience of having 30% of its volume being noncombustible water. It will work in an emergency, but is not a first choice.

**BATTERIES:** AA most versatile: Adapters available that turn AA into a C or D cell.



Alkaline batteries are best stored in an airtight container in a cool location. They have a shelf life of three to five years. If stored correctly they will last much longer than the expiration date printed on the package. Don't work well when cold. Buy cheap in bulk at Costco.



CR2032 Coin Cell Lithium Batteries: In headlamp or cap light, work for 120+ hours, very cheap (20 for \$2.94 x 3=60 batters=3600 hrs for \$13).



Lithium batteries: They can last 2 to 8 times longer than a standard alkaline battery and will work in colder temperatures when other battery chemistries will give no power at all. They will store about ten years. Sam's Club carries the e2Lithium's.



Rechargeable Batteries: You can use plug-in or solar charger. A good practice is to charge your cells, then let them trickle charge over night. The pull them off the charger and set them aside with a note telling you when they were last charged. In 90 days at room temperature they will have lost around half of their charge, so you can charge them back up again. NiCds need to be charged 5+ full cycles before using and should be stored discharged. NiMH cells should be stored with a charge. NiMH cells like to be treated gently. When you're done with your device, recharge the cells. The more shallow the cycle the better. Full cycles will wear on them the most. Keep NiMH cells topped off and they'll last the longest. Occasionally you may need to perform a deep cycle to restore some performance if the cell appears to be waning. Eneloops is a good brand and carried at Costco and Wal-Mart.



**Charger:** Recharge lithium and NiMH batteries. Some use electricity to recharge others use or can convert sun into energy. It takes 8 hrs of sun to charge AA batteries. Never charge batteries if below freezing. If you really need a charged cell, warm it up in your pocket (preferably the charger too).



**CHARCOAL:** *Outdoor use only.* Charcoal burns hotter and cleaner than wood. It is the least expensive fuel per BTU that you can buy and safe to store Use good quality like Kingsford for easier lighting and better burn time. Stores indefinitely if kept dry. Remember to store newspapers, canned heat, or lighter fluid to start the charcoal. For applebox OR Dutch oven: 1 hr day =24-#15 lb bags charcoal.



**GASOLINE:** *Only outdoor use.* For use with generators, uses a lot of fuel. Can also be used in some lanterns and stoves. Stores 1 year in tightly sealed container, 5-10 years with stabilizers added once a year. Keep in cool place. Only fill containers 95% full to allow for expansion in the heat. Cap tightly. Limits on amounts to store.



**Generators:** Portable generators can provide comfort, safety and security during power outages and emergencies. Decide on your NEEDS and purchase the smallest generator that would fit those needs. The smaller the generator, the less fuel it requires. Depending on the generator, it can run off of diesel, propane kerosene or gas (1/2-3 gal. per hr). A generator can be useful in a charging batteries or using appliances, including a small refrigerator for several hours each day. Generators, are useful in short-term emergencies, but because of the amount of fuel they use, are not practical for long-term usage. They are also very loud, can only be used outside, and will draw attention to the fact that you have power when others do not. If you are planning on one big enough to power all or part of your house, you will need special wiring to be done by an electrician. You could get a 5500 watts, 13 HP that would run most of your house for \$500.00. The problem with \$500 generators is that they are not designed for long term use. Usually their target is 500 HOURS before they are basically run out. Moving to \$900 for generator one can get a LONG TERM generator and it can last up to 5000 hours.



**KEROSENE:** (use battery-powered CO detectors when using kerosene in the house or tent). Kerosene is one of the cheapest, most efficient fuels to store. It has been used for heating, lighting and heating for hundreds of years. Only store high-quality clear, 1K kerosene. It has a long shelf life, but you can add an additive like PRI-D diesel treatment to last longer. It is also not as explosive as gasoline or Coleman fuel. Store in blue plastic container (universal symbol for Kerosene) or one that is clearly marked and NEVER store it in a container that once held a different fuel, such as gasoline. If stored in a non-lined metal containers it will eventually leak. Store outside/shed, only in shade. It has a strange odor when burned and can be used for lighting, heating and cooking.



**KLEAN HEAT:** Similar to kerosene, but odorless and less smoke. Can be ordered online or at Lowe's or Home Depot in the paint department. Stores indefinitely. Store outside or in garage. About \$36 for 5 gallons, also 1 gal.



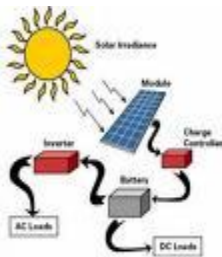
**LAMP OIL:** Petroleum based. Odorless/smoke free. For hurricane type lamps. Stores indefinitely. Lamp oil should be 1/2" below top of neck and not less than 2" below while using. Wick should not be visible above the dome while burning. If it's too high it will cause smoke. 10 hours per ounce burn time or 640 hrs/128 days for 1/2 gal, 2 gal=1 year per lamp. Store extra wicks and lamps if possible. (Wal-Mart)



**NEWSPAPER LOGS:** Four logs burn approximately 1 hour and produce heat comparable to the same amount of wood on pound-per-pound basis. To Make: Roll 8 pieces of newspaper tightly around a dowel, one at a time, and adding the next in before you reach the end. Tie off ends with twine, remove dowel. Will store 20 years, keep dry.



**PROPANE:** *Outdoor use only* unless appliance has ODS (oxygen depletion sensor). Stores indefinitely. Store outdoors in shade in upright position. Propane containers must be recertified every 10 years. Small cylinder will burn about 2 1/2 hours) a 5 gallon one for 12-14 hours (half that time in the cold. Can be used for lanterns, stoves, and heaters. Usual legal limit 5 – 5 gallon tanks. Small bottles \$3+ each.

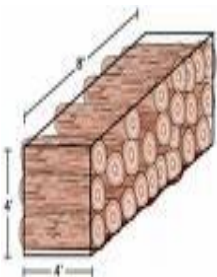


**SOLAR:** Solar energy simply put is this:

Rays from the sun are collected by a solar panel; this power goes into a charge controller and then is stored in a battery. In order to use this DC power you need an inverter which converts the power in the battery into AC power; with this done you can simply plug your small appliance into the inverter and it will work. The more solar panels and batteries you have: the faster it charges; the more power you will be able to use and the longer it will last.



**WHITE GAS** (Coleman Fuel): NEVER use indoors! An un-opened container of Coleman fuel stored in a dry area with no rapid extreme changes in temperature will remain viable for 5-7 years. An opened container stored in the same area will remain viable for up to 2 years although it is at its best if used within a year. Lantern: 38 gal=5 hrs a day, Cooking Stove: 91 gal=4 hrs 2 burner stove per day.



**WOOD:** In some areas wood is plentiful and can be obtained for fuel. Works best if dried for at least 6 months before burning. It stores many years. Hardwood burns longer. In Southern California you would need, 2-4 cords for winter warmth/cooking. When buying wood make sure it is clean, dry and free from termites and other insects. Store outdoors; preferably covered and re-stack every five years to prevent build-up of debris that can cause spontaneous combustion. It takes 16 lbs of wood to produce the same amount of heat as one gallon of heating oil. In cold places, you might need 10-14 cords.

## Fire Starters:

I mention these because it really won't do you much good to have a short term or year supply of fuel, if you don't have anything to start them with.



Matches: waterproof a great idea, but at the very least store them in water/humid proof containers such as: #10 cans, buckets or Mylar bags.



Butane lighters: Get a good one with extra fuel.



Flint & Steel or Blast Match: Fire starter that is operable with one hand and never fails to light in the wind, rain, or snow. It generates a stream of sparks three times the heat of a standard match and easily will light any material (wood, paper, bark, cloth, or man-made fire starting tinders) that a match will ignite. You can accurately aim the sparks to ignite a roaring fire in any weather conditions.



Charcoal Chimney: A chimney starter is a good way to start your coals. It is a metal cylinder with a grate near the bottom and has a handle. Unlit charcoal is placed on top and a flammable material (i.e. newspaper) underneath the grate. The charcoal at the bottom lights first and the "chimney effect" lights the rest. Another method is to place the chimney over canned heat or chafing fuel. It is a little less messy than newspaper.

# FUN ...MAN IS THAT HE MIGHT HAVE JOY

During times of stress we all need diversions. Wither it be an earthquake or a situation when you have to be isolated in your own home due to a pandemic or biological attack, planning ahead can mean the difference of sitting around twiddling your fingers or having fun. Even the pioneers, while crossing the plains, played games and danced to bring joy into their lives.

Collect a variety of things that your family would love to do if you were in a shelter or stuck at home without TV or other electronic toys. Here is a few ideas to get you started.



**Balls:** Handballs, bouncy balls, baseballs, footballs, basketballs, soccer balls, tennis balls, volleyballs. Pick some that your family enjoys. You can even make up new games using them.



**Board Games:** Have a variety of games that your family loves to play. There are even travel versions which take up less space. Games like: yahtzee, monopoly, stratego, dominos, rummy tiles, scattagories, etc.



**Books:** Have a large variety of books to read for all ages in your family. There is something about curling up with a book even amongst the rubble that brings us comfort and distractions from what is going on around us.

be sure of



**Card Games:** a deck of cards can be used for many different games you might even get a card game book for even more variety and to the rules. Also, kids games are a great addition.



**Coloring Books** or plain paper, crayons, colored pencils, markers. Things to keep the mind busy, its relaxing and uses their imagination. You can even use the finished art pieces to decorate the rubble or your tent.



**Construction:** During an earthquake you may not have time for construction fun things like club houses or play houses, but during a pandemic, if your family is healthy, it would be a perfect time for family building and bonding.



**Family History:** Probably not something you do amongst the rubble, but a pandemic time would offer lots of at home time to get your family history organized, in putted and in order.



**Home Improvement Projects:** What better time to paint, or pull weeds or clean out the closet than when the world shuts down and you have time at home. Of course you will need supplies already at home, but why not be prepared in all things???



**Homemaking Skills:** Knitting, crocheting, sewing, and quilting are all great things to work on and have supplies for. Supplies for mending and creating clothing and can also create time to pass the skills on to others.



**Imagination Toys:** Things like Legos, Lincoln logs, blocks, etc. They don't take up a lot of room and provide hours of fun for boys and mean alike.



**Movies:** How fun would be to have family movie night even amongst the rubble. There are portable DVD players that can run off of power packs or solar panels. Maybe even pack away a few new movies to relieve the boredom.

1	5			9	3			
3	7			6		2	4	
		5		3	7			
9	4	5		8	1			
				1	2	4		
8		4				9	7	
8		2			6	7		
5	2	6		1	9			
	6	8						3

**Paper games and puzzles:** Things like: word searches; crossword puzzles; Sudoku; Cryptogram; etc, things to keep the mind busy.



**Puzzles:** A variety of puzzles is a great idea for entertainment that can be used over and over again.



**School work:** Kids do better in stressful conditions if they can continue to do things they are used to. Have school work available to keep them busy during times of stress. And don't forget the pens and pencils!



**Scrapbooking:** Are you like me and have LOTS of pictures and no photo albums, no names or dates to let your grandchildren know who and what is going on in the photos? Well why not take the time during a pandemic to catch up? Make sure you have lots of paper, glue and pens and notebooks to organize them all in.



**Small Toys:** Age and sex appropriate toys is vital to keep little minds and bodies busy. Things like: cars, dolls and clothes and animals will bring comfort and joy to your little ones.

## *Now What?*

### ✓ **Make a Plan for YOUR Family: Repairs, Lighting; Cooking; Heating and FUN!**

This is will different for each family but I recommend getting at least two kinds of things to: light, cook and heat. For instance: we have light sticks, right next to the bed to light if there is an earthquake in the middle of the night (with gas leak, even flashlights can set off explosions); headlamps for hands free lighting; bright flashlights for looking near and far and lanterns for general room lighting. The same for cooking: apple box oven/solar oven for baking (yum); rocket stove for bring things to a boil; icebox cooker for simmering without power. You get the idea. Planning for more than one type of “Light” is just common sense.

### ✓ **Gather Your Tools, Fuels and Fun**

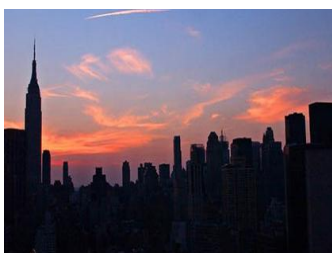
Now is the time to gather your supplies, while they are still available.

### ✓ **Practice, Practice, Practice**

How about a family, friend, ward or neighborhood drill? Pick a day, sooner rather than later and go 24 hours without: utilities or water. How will you cook, light, heat and wash? Learn how to use your supplies now so that when disaster strikes you will not only know where everything is that you need but you are comfortable with using it. The upcoming and the **Lancaster Stake Drill in October and So California Shakeout Drill on Oct. 15<sup>th</sup>** ([shakeout.com](http://shakeout.com)) would be perfect times for this.

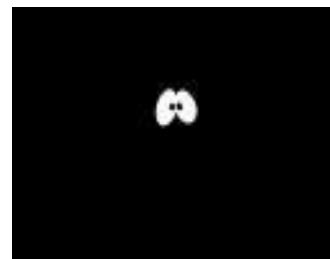
### ✓ **Feel the Peace of Preparedness**

I promise you that as you follow the words of the Prophets and get prepared, the fear you may be feeling right now, will dissipate. There is nothing like the peace the Spirit brings when we are following the commandments. Food Storage and emergency preparedness are a matter of faith.



*The Lights WILL Go Out.*

**Will you be left in the dark?**



*To quote a line from Harry Potter, “Dark and difficult times lie ahead. Soon we must all make the choice between what is right and what is easy.”  
What will you choose?*

**“When will all these calamities strike?**

**We do not know the exact time, but it appears it may be in the not-too-distant future.**

**“Let every head of every household see to it that he has on hand enough food and clothing, and, where possible, fuel also, for at least a year ahead...Wood, coal, gas, oil, kerosene, and even candles are among those items which could be reserved as fuel for warmth, cooking, and light or power.**

**Those who are prepared now have the continuing blessings of early obedience, and they are ready.**

**Noah built his ark before the flood came, and he and his family survived.**

**Those who waited to act until after the flood began were too late.**

**May we ever remember the Lord’s promise, If ye are prepared ye shall not fear.”**

**“Prepare Ye”, Elder Ezra Taft Benson, *Ensign*, Jan 1974, 68**

**It is my prayer that you will choose The Light**

### Fuel Storage Comparisons: [yourfamilyark.org](http://yourfamilyark.org)

Conflicting information is everywhere! This is our best estimate according to our research. Use great caution in storing fuel! It is important to understand a variety of fuels and how to safely use and store them. Be sure to check with your local authorities and comply with all laws and regulations in your area.

Fuel	Recommended Shelf Life	What Happens After Shelf Life	How to Store Safely	Cautions
<b>Alcohol</b>	Indefinite		Store in tightly sealed container in a cool, dry place.	Extremely flammable Evaporates quickly
<b>Batteries (Lithium)</b>	10 years	Lose potency	Store in an airtight container in a cool location	Leakage
<b>Batteries (Alkaline)</b>	3-5 years -	Lose potency	Store in an airtight container in a cool location	Leakage
<b>Butane</b>	8 years - Indefinite	N/A	Store in cool, dry place away from heat sources	Highly Flammable
<b>Canned Heat</b>	Indefinite if unopened	May not burn as well	Store upright, away from heat sources.	Cans may leak if not stored in an upright position
<b>Charcoal</b>	Indefinite if kept dry.	May not light or burn well if wet- dry to restore viability	Store in airtight plastic or metal containers keep dry.	Never use indoors!
<b>Coal</b>	?	Air speeds up deterioration and causes coal to burn faster	Store away from circulating air, light, and moisture away from home	Susceptible to spontaneous combustion Produces carbon monoxide
<b>Coleman Fuel (white gas)</b>	6-7 years (unopened) 1-2 years (opened 1/2 full)	Will not burn as well	Store in original container, in a dry area, with no rapid or extreme changes in temp.	Highly flammable Produces carbon monoxide Never use indoors!
<b>Diesel</b>	18-24 months	Life may be extended with a fuel stabilizer Will not burn as well	Store in approved containers in detached garage or shed	Produces carbon monoxide Do not burn indoors!
<b>Firewood</b>	3-4 years	Decreases in BTU output	Store off the ground, keep dry; plenty of air circulation; away from the house	Termites, pests, and rodents
<b>Fuel Tablets (Esbit, Trioxane,)</b>	Indefinite	N/A	Store in a dry place in original packaging	Use in well-ventilated area Do not burn indoors!
<b>Gasoline</b>	12 months 3-5 w/stabilizer	Breaks down and becomes ineffective	Store in approved containers in detached garage or shed	Highly flammable Storing large quantities is hazardous
<b>Kerosene</b>	5+ years	Will not burn as hot	Store in approved plastic container. Store in shed	Use in well-ventilated area
<b>Lamp Oil</b>	Indefinite		Do not allow to freeze!	Combustible liquid
<b>Lighter Fluid</b>	Indefinite	N/A	Store in a cool, dry place away from open flames	Newspaper or canned heat will work in a charcoal chimney and is much safer
<b>Matches</b>	Indefinite	N/A	Keep dry!	
<b>MRE Heaters</b>	5 years - Indefinite	Takes longer to heat up and does not achieve high temperatures	Store in a cool, dry place away from water.	Keep activated heater away from open flame
<b>Newspaper Logs</b>	Indefinite	N/A	Store in dry place	Burns better if mixed with regular wood
<b>Propane</b>	Indefinite	N/A	Watch canister/tank for signs of rust or dents. Store in shed.	Flammable gas Only use in appliances rated for indoor use
<b>Wax (Candles)</b>	Indefinite	N/A	Store in a cool, dry place	Open flames are dangerous Use great caution!

RECOMMENDED EMERGENCY HOME FUEL STORAGE  
LIMITS AND GUIDELINES

*(UTAH guidelines: check with Fire Dept in your area)*

*The information in this brochure is only intended to provide typical homeowners with general guidelines concerning emergency fuel storage at residential locations. Please consult your local fire department for definitive answers to any questions you might have, after reviewing the following recommendations.*

**Can I store emergency fuel containers inside my home, basement and/or attached garage?**

*A: No! Generally speaking, we ask that you only store emergency fuel containers in a detached shed or garage to minimize fire hazards and ignition sources. Two or three (2 or 3) 1-gallon DOT rated containers for gasoline, and 2-cycle fuel for general operation of lawn maintenance equipment, are permissible in your attached garage. We have experienced many serious problems with larger quantities of fuel inside homes, basements, attached garages and carports.*

**Can I store as many containers as I want in my garden shed or unattached garage?**

*A: No. Depending on the type of fuel (gasoline, kerosene, diesel, propane), you are only allowed to store limited quantities of each type of fuel in certain kinds and sizes of containers.*

**What authority does the fire dept. have to tell me what I can/cannot do in my own home?**

*This really is a life safety (your life safety) issue. Also, your homeowner's insurance provider would like you to keep the quantities of flammable liquids stored at your residence to a bare minimum.*

**Home Storage of Flammable Liquids**

Gasoline and Coleman White Gas: Maximum residential storage of flammable liquids (gasoline and white gas) shall be limited to 25 gallons; preferably stored in an unattached garage or shed. Of this 25 gallon total, no more than 10 gallons can be stored in an attached garage; and absolutely no flammable liquid storage is allowed in basements. Empty containers shall be counted as full when calculating total storage capacity. Flammable and combustible liquids in the fuel tanks of motor vehicles (gasoline, diesel and 2-cycle blends) are exempt, and therefore *not* considered as a part of your total home fuel storage quantities.

Flammable liquid storage containers shall be of an approved type. Most of these containers are labeled as approved for flammable liquid use, and indicate the standards they are designed to meet. Always use approved or original retail containers. No used milk jugs!

If you decide to store more than 5 gallons of flammable liquids at your home, you need at least one 2A10BC rated fire extinguisher, located no closer than 10 ft, and no further away than 50 ft.

Control of sources of ignition is mandatory! All transfer and dispensing of flammable liquids requires careful attention be paid to eliminating static spark discharge, and ignition of flammable vapors. Open flames and high temperature devices must be controlled and approved for use with flammable liquids. And, smoking is prohibited in the storage area.

### **Home Storage of Combustible Liquids**

Diesel, Kerosene and Lamp Oil: Maximum residential storage of combustible shall be limited to 60 gallons; preferably stored in an unattached garage or shed. Of this 50 gallon total, no more than 10 gallons can be stored in an attached garage; and absolutely no combustible liquid storage is allowed in basements. Combustible liquid storage containers shall be of an approved type. Most of these containers are labeled as approved for flammable liquid use and indicate the standards they are designed to meet. Always use approved or original containers. No used milk jugs!

If you decide to store more than 25 gallons of combustible liquids at your home, you need at least two 2A10BC rated fire extinguishers, located no closer than 10 feet, and no further away than 50 feet.

Control of sources of ignition is mandatory! All transfer and dispensing of combustible liquids requires careful attention be paid to eliminating static spark discharge, and ignition of flammable vapors. Open flames and high temperature devices must be controlled and approved for use with flammable/combustible liquids. And, smoking is prohibited in the storage area.

Portable Kerosene heating appliances shall be (UL) listed, and shall be limited to a fuel take capacity of 2 gallons. However, the Uniform Fire Code specifically prohibits the use of these unvented heating appliances in occupied living spaces. If you decide to use these devices, closely follow the manufacturer's instructions for use, always maintain adequate separation from combustible surfaces, maintain good ventilation in order to prevent carbon monoxide poisoning, and use a battery powered Carbon Monoxide detector to detect dangerous conditions.

### **Home Storage of Flammable LP-Gases**

Propane and Butane: Residential Propane storage issues are more complex than those for flammable and combustible liquids. If you want a permanent LP-Gas system and tank installed, county ordinance allows you up to 2,000 gallons water capacity in heavily populated areas, provided you obtain a permit, comply with relevant installation codes, and hire a state licensed contractor to perform the work and supply the equipment and product. However, some cities have passed local ordinances that restrict total LP-Gas capacity to 500 gallons or less, where natural gas service is readily available. Please contact any state licensed Propane supplier, under "Gas-Propane" in the yellow pages, for more information regarding permanent Propane gas installations.

For portable DOT tank storage, you are allowed up to 25 gallons total capacity. You could have up to five 5-gallon (20 lb) portable appliance cylinders (the size usually found on barbecue grills; or one 23-gallon (100 lb) cylinder, in storage at your home, in an unattached garage or shed. But, if you want to store propane and flammable liquids together, they should be separated by at least 10 feet. You are only allowed to store up to two (2) of the small portable 1-pound cylinders inside your home or attached garage. All other propane cylinder storage must be outside your home in an unattached garage or shed.

Propane cylinders attached to heating and/or cooking appliances, as well as those mounted on trailers, motor homes, and campers, do not count towards your total storage capacity.

Unattached or empty cylinders are counted as being full for purposes of calculating your total storage.

## Important Fuel Considerations

[yourfamilyark.org](http://yourfamilyark.org)

**Number of people** - number of cooking hours and type of fuels will vary depending on the size of your crowd.

**Types of food stored** - whole grains take significantly more fuel than canned foods.

**Weather conditions** - plan for cold, hot, and stormy weather.

**Physical environment** - ability to store and use certain types of fuel will change depending on your location (house vs. apartment). Be sure to plan for portable cooking in case of evacuation.

**Storage space** - location and amount of storage space.

**Practicality and financial investment** - active solar and wind power is a wonderful option. It would not be practical for some homes and is a huge financial investment. Be wise!

Set realistic goals and make steady progress to achieving them. Practice to ensure that your estimates are accurate. We found that canned heat had to be modified when we started using 2-3 cans at once to achieve higher temperatures. Change as needed.

Use this table as a starting point as you evaluate the needs of your family and plan your cooking fuel storage (evaluate heating/electric power separately).

<b>Sample One Year Cooking Fuel: <a href="http://yourfamilyark.org">yourfamilyark.org</a></b>				
Fuel	Size	# Needed	# Hours	Cost
<b>Alcohol</b>	Quart	4	20	\$ 20
<b>Canned Heat</b>	6 hr Can	60	360	\$ 60
<b>Charcoal</b>	15 lb. Bag	27	180	\$ 100
<b>Gasoline</b>	5 Gal Can	1	Power Generator	\$ 16
<b>Kerosene (Klean Heat)</b>	5 Gal Can	4	260	\$ 76
<b>Propane</b>	20 lb	5	75	\$ 40
<b>Solar Energy</b>	Oven	2	720	FREE
<b>Totals</b>			<b>1715</b>	<b>\$347</b>