

SURVIVAL SERIES

The Long-Term Family Survival Course



Table of contents

Family Values and Your Contribution 4

Survival is no kids game..... 5

Planning is everything..... 6

Don't panic!.....8

Be realistic!9

Food for your family..... 11

44 foods you need to stockpile for your family's long term survival 13

How to build a Greenhouse 18

Calculating a Year's Food Supply..... 20

Calculating food requirements..... 23

Food Storage Tips 23

Dry Ice Fumigation..... 26

Vacuum Packaging..... 27

Shelf Life Guide..... 27

Water for your family 29

Ways to Purify Water 30

Bad water diseases 35

Sourcing water 39

Herbal medicine for your family 42

Storing plants..... 43

How to prepare and use herbs..... 44

When herbal medicine is not for you 48

Herbs that heal..... 49

Other herbal remedies..... 58

Energy for your family..... 62

Build your own Solar Panels..... 63

List of Tools..... 63

List of materials..... 68

Construction..... 72

Types of solar systems..... 84

How to sell electricity back to the grid 86

What about wind power?..... 88

Build your own wind turbine..... 90

How Much Power and Energy Does a Wind Turbine Generate..... 92

How to estimate your current electrical demand 94

A simple device to reduce your electric bill..... 96

Alternative solutions..... 98

How to build a cheap portable generator 98

Basic Components..... 99

Additional components..... 104

How to Modify Your Lawn Mower 105

Removing the Blade Assembly..... 106

Cutting the Slot..... 107

Mounting the Alternator..... 108

Attaching the Pulley and Belt 110

Hooking Up Your Electrical Connections for the Alternator 111

Protect you family **119**

Ways to Reduce Risk..... 120

Weapons for self defense..... 121

Your body as a weapon..... 122

How to build a panic room..... 128

The Bug Out Bag – The 15 items you can’t go without..... 129

Avoid a government roundup 134

Final thoughts..... **135**

Family Values and Your Contribution

Keeping a FAMILY together has never been easy. It's a struggle to ensure its safety and prosperity, especially in these hard times. And I'm not only talking about the economy, but about being able to make smart decisions to survive. I know this because I'm a family man, just like you. I want to constantly protect the ones I love and make them happy.



But what I also know is that it's not impossible. And this course that I wrote after gathering years of practical survival experience will show you that I'm right.

A strong family unit creates a safe, positive and supportive place for all members to thrive. They are able to utilize resources and to live together in a fairly healthy manner. I'm sure that's what you want for you and your loved ones. You proved it when you bought this guide and you will prove it when you will have applied everything that I am about to teach you.

I have dedicated years of my life to helping people and I'm convinced now that it's my mission to do this for the rest of my life.

This course represents my whole work put together and organized for all true patriots to use. Make sure you keep it in a special place, so you will always know where to find it.

Before we get started, I want to salute the great contribution that my friend and mentor, John Lahan has brought to this book. You will find the essence of his teachings written on the pages of this guide and it will completely change your life, like it did with mine.

Survival is no kids game

You have probably noticed recently that the Survival shows are becoming the most watched ones in America. People find this entertaining and of course, it's like watching an adventure movie.

The truth is Survival is no GAME. There are no rewards at the end and there's no immunity. It's a real emergency situation and if you're not properly prepared, you might lose everything, including your LIFE.

But you're not one of those people. Not when you've got your hands on the best survival course on the market. After training with highly qualified survivalists, after years of research and practice, I am now ready to share with you my entire knowledge and expertise, in order to provide safety for you and your family.

The latest disasters that stroke our country taught us that putting our trust in the government can no longer be an option. Long story

short, we're on our own. So, let's start planning, so we can then live and sleep with no fear of what tomorrow brings.

I've organized this course focusing on five main issues every survivalist should consider: **Food, Water, Energy, Health and Self Defense.**

And I will start by explaining the number one rule of any survivalist: **the importance of preparing.**

Planning is everything

Planning is one of the most essential elements of any effective strategy. The art and science of survival planning involves strategically stockpiling gear, learning skills and using what you've learned, testing your abilities to see what works under real world conditions.

Have you ever heard this expression: "If you fail to plan then you plan to fail"? I've tested it!

Making matters worse, without a plan your efforts often become scattered and less focused and you end up wasting a lot of time and money-getting no where. People often fail to reach their goals because they never had a specific plan.

You need a plan, actually write it down so you don't forget – as each item is completed check it off the list and move on to the next. This is smart survival planning that'll help you to save time, stay focused and avoid wasted resources.

Smart survival planning should take into account individual needs, location and perceived threats.

In the desert fresh water would probably be your number one concern, while the survivor in Alaska would be more concerned with cold weather, for example. Think about your location, needs and plan accordingly.

The last factor in survival planning is time. You have to determine both how much time you have to meet your goals and also how much time is needed to reach those goals, working within that time line.

Remember too that your goals will change as time goes on. Adjust them regularly to reflect growth in your knowledge and experience. For example say you initially plan for a family of four, only to learn six months later that you have a new-born on the way. Be flexible.

Your personal survival in harsh physical conditions and other emergencies involves more than simply applying the right techniques. A synergistic combination of skill, intuition, action, wisdom, good judgment, training, preparation, and the most important factor of all, the determination to survive, will give you the best chance for success.

It pays to be both mentally and physically prepared for survival. The mentally prepared person has a "can do" attitude; she or he sees problems as obstacles to surmount, and has learned basic skills for dealing with survival situations.

The common personality traits of survivors are just as useful for adapting and thriving under the changing conditions of modern society, as they are for dealing with emergencies. Physically prepared people have supplies on hand to deal with emergencies and have respected their bodies enough to maintain some kind of physical conditioning, thereby enabling their bodies to perform when needed.

Don't panic!

Try to remain calm, but do not become paralyzed. Action will most likely be required to see you through your ordeal, but it must be the right kind of action. When you are unable to think clearly, it is a poor time to make major decisions. It is important not to waste precious energy and resources doing the wrong things or going to the wrong places. When you are tense and bound by fear, try breathing deeply and repeating a simple word or phrase, such as "stay calm" or "God is good."

I have noticed that when my breathing is shallow and tense, my muscles are also tense and I waste my energy by fighting one muscle against another. By consciously controlling my breathing, through forcing myself to breathe deeply, I can send a wave of energy and relaxation to my arms and legs, helping me to overcome the debilitating effects of fear.

Be realistic!

Rambo types are often the first to go. Use a healthy mix of positive attitude and determination to survive, tempered by realistic appraisal of pitfalls and dangers.

We are living in an era of mega storms, international terrorism, and increasingly destructive earthquakes. It would be foolish to assume that there will not be significant disruptions in the supply of electricity to your local grid at some time in the not-too-distant future.

Remember, when electricity stops flowing, furnaces, cash registers, gasoline pumps, phones, and air conditioners all stop working, except for the rare facilities that are hooked up to a backup source of power. Without gas and electricity, most municipal water treatment and waste removal systems will soon shut down and emergency medical services are usually severely limited. If temperatures are well below freezing, without a backup source of heat (or winterized plumbing), toilet bowls and pipes can start to freeze and burst within a day or two after the power goes out.

Disturbances such as floods, earthquakes, major storms, or terrorist acts may disrupt the distribution of electricity, food, fuel, goods, and services for significant periods of time.

If a major hurricane or other natural disaster such as a severe earthquake were to strike your community, would you be well prepared?

To help you organize your thoughts and guide your actions, ask yourself the following questions while making your emergency plans and building your backup supplies and skills:

- What natural hazards are there in my area? Have I taken precautions to protect my home?
- What is my potential for being caught in a significant earthquake, flood, hurricane, or tornado?
- How long do I anticipate that I might be without access to utilities and supplies?
- If the electricity goes out for an extended period of time, how will I cook, and how will I heat and light my home?
- Do I have supplies and training to deal with medical emergencies if medical help is unavailable?
- If I must evacuate my home, do I have portable emergency supplies readily available to bring with me?
- How many people do I wish to store supplies for?

What about my friends, neighbors, or relatives?

- Do I have pets that I wish to feed and care for?
- Do I have small children or infants with special needs?
- Do I require prescription medications or are there any addictions I wish to provide for if distribution systems go down for a period of time?

Food for your family

When you are planning to store food, water, and other items to supply your household for significant periods of time (more than one month), the packaging, preservation, and nutritive quality of your food stores will be vitally important.

You can purchase specialty prepackaged bulk foods from preparedness/survival suppliers, or package your own foods. I suggest you store a significant variety of foods preserved by a variety of methods.

Not many people know this, but traditional high heat canning processes destroy 60% to 80% of the food's nutritive value, but low-heat dehydration results in a loss of only about 10%.

Many canned foods do have the advantage of providing syrups or juices, which can be a significant source of water if you are experiencing scarcity. If you have access to a source of water, however, it makes better sense to use dehydrated foods. A pound of dry grains or beans will contain many times the calories of a typical pound of canned foods. Each pound of dehydrated fruits or vegetables is equivalent to 10 to 12 pounds of fresh, canned, or frozen produce.



Stored whole grains may be sprouted to give you the nutritive value of fresh, "live" food. Most whole grains and beans can be sprouted. The sprouting process converts proteins in the seeds into different essential amino acids and dramatically increases their vitamin content.

For example, sprouted soybeans have 700% more vitamin C than the dry beans. Vitamin C is a natural detoxifier, destroying damaging toxins in the body. It is essential for helping the body maintain an effective immune system and for preventing deficiency conditions, such as scurvy. The downside to whole grains is that unless they are kept cool, they contain oils that can go rancid, thereby ruining them for consumption.

Whole grains last much longer than grains ground into flour, because finely ground particles have far more surface area for oxidation (degradation). A grain mill, preferably hand cranked is useful for turning your stored grain into flour as it is required.

Most long-term storage programs stress wheat storage, because properly stored wheat has an indefinite shelf life. Some wheat discovered in the pyramids was found to be viable after thousands of years. Brown rice, on the other hand, has a typical shelf life of six months to one year, which may be extended to two to three years with proper packaging and storage.

44 foods you need to stockpile for your family's long term survival

Wheat, flours, and beans are the easiest bulk materials to store for calorie, shelf life, and nutritive value.

Remember to buy a quality grinder for grinding grains into flour. It should be hand cranked or combination hand and power unit.

Barley is one grain that I suggest for those who need foods with low gluten content. **Soybean** is the legume with the highest protein content in commercial production.

I would also recommend **rice**. It's possible to purchase brown rice from long term food suppliers already specially packaged in air tight containers with an inert nitrogen atmosphere or you can do it yourself. In this kind of packaging, (if properly done), the storage life can be extended for several years.

A nutritious item to be mentioned here is **pasta**, which is easy to pack and has a great shelf life. You can eat it simple or combine it with many other food items like canned vegetables, meat or milk.

And if you eat pasta, you will surely need **tomato sauce**. Tomato sauce is used as a base for almost any food which needs a lot of tomato flavor. Stored properly in a dry and cool place, it can last up to 18 months.

Cereals are a very nutritious part of your breakfast. Remember that you will need milk for cereals. Keep them in airtight containers. Tins work nicely for this.

Dried **noodles** are usually eaten after being cooked or soaked in boiling water for 2 to 5 minutes, while precooked noodles can be reheated or eaten straight from the package. It is a great alternative when you don't have the time or possibility to cook.

Instant mashed potatoes are a pretty nutritious food as well. They're easy to prepare and have a great shelf life.

You will also need cooking catalysts and seasonings. They include **oils, shortenings, salt, leavenings, herbs, and spices.**



Here I have to mention **vinegar**, a preservative, that can jazz most mundane dishes on earth, a cleaning agent and solvent, and a deodorizer; vinegar is a must-have in any kitchen cupboard. Always shut the bottle cap of vinegar tightly. It is prone to evaporation. Keep it away from strong aromas and odors in a dark, dry place.

Powdered milk, dairy products, and eggs. Good for nutritive value and variety in cooking options.

Sprouting seeds and supplies. With a couple of jars, some nylon stockings, and a variety of seeds, you can eat garden-fresh live foods

for pennies a day. I suggest alfalfa seeds, any whole grains, mung beans, soybeans, lentils, and cabbage, radish, and broccoli seeds.

Sweeteners like **honey, sugar and maple syrup** are also important. Not essential, but may help sweeten an otherwise bitter experience. Honey has the advantage of being a natural topical antibiotic. It has been used for centuries on the battlefield for helping wounds to heal.

Filtered liquid honey will last the longest in storage. Storage containers should be opaque, airtight, moisture and odor-proof. Like any other stored food, honey should be rotated through the storage cycle and replaced with fresh product.

If crystallization does occur, honey can turn liquid again by placing the container in a larger container of hot water until it has melted. Avoid storing honey near heat sources and if using plastic pails don't keep it near petroleum products (including gasoline/diesel engines), chemicals or any other odor-producing products.

Canned and dried fruits, vegetables, and soups. Store a variety of your family's favorites.

Pickles. Pickling means preserving food by immersing it in salty water. In this airless environment, beneficial bacteria and yeasts grow and produce acids, which, in turn, keep dangerous microbes from growing and causing spoilage.

You can pickle almost anything. Pickles cucumbers are the most common, but you can also try olives, peppers and number of stuffed vegetables.

Garlic. Store garlic in a dry place and help your family stay away from diseases. Garlic is well-known for boosting the body's immunity.

Canned, dried, or frozen meats and fish. Store these if you will use them.

Vitamins and **minerals** will have to supplement the limited nutritional value of stored foods. I suggest using quality supplements manufactured from live foods wherever possible (check your local health food store). Super-food supplements, such as blue green algae and bee pollen, would be a good addition to your emergency food stores.

Pleasure food would include **popcorn, nuts, peanuts, peanut butter, cocoa/juice powder.** They are nutritious and great for lifting morale or giving yourself a little reward.



Beef Jerky is probably one of the most survival friendly foods you can possibly find. It's healthy, delicious and has a fantastic shelf life. The great thing about it is that you can also make your own or substitute beef for turkey.

Power bars are a healthy snack that gives you all the energy you need to stay strong. We recommend avoiding chocolate covered bars for storage, because they tend to melt and go bad pretty quickly.

Sports drinks re-hydrate the body and provide sugars, which the body burns to create energy and replenish electrolytes. Electrolytes maintain salt and potassium balances in the body.

Tea. The benefits of tea are numerous. Tea plays an important role in improving beneficial intestinal microflora, as well as providing immunity against intestinal disorders and in protecting cell membranes from oxidative damage. Tea also prevents dental caries due to the presence of fluorine.

The role of tea is well established in normalizing blood pressure, lipid depressing activity, prevention of coronary heart diseases and diabetes by reducing the blood-glucose activity. Tea also possesses germicidal and germistatic activities against various gram-positive and gram negative human pathogenic bacteria.

Both green and black tea infusions contain a number of antioxidants, mainly catechins that have anti-carcinogenic, anti-mutagenic and anti-tumoric properties.

Regarding storage you need to pay attention to some important factors. Store far away from anything with a strong odor. Store in a dark cabinet or completely opaque container. Keep delicate teas separate from strongly scented teas. Avoid storing tea in humid areas of your kitchen and house.

Glazed ceramics, non-reactive metals and opaque, non-leaching plastics all make great packaging materials. Wood packaging may be a workable option, but be aware that many wood containers have odors that can influence the tea's taste.

Coffee. Green Coffee beans have not been roasted yet, so you can roast them yourself when you are ready to enjoy them. Since the bean is not cracked yet, the shelf life is many years longer than roasted or ground coffee. Because these are canned with oxygen absorbers and food-grade desiccant packs, you can expect these to stay fresh for 20+ years.

Roasting them is as simple as putting them in a pan over heat (stove, solar oven, camp fire, gas grill, etc.) or putting them under heat (broiler, oven, etc.). One of the most popular methods of roasting coffee at home is as simple as using a hot air popcorn popper.

The last, but the most important food item you will need is **water**. Store your water in thoroughly washed plastic, glass, fiberglass or enamel-lined metal containers. I will detail how to properly capture and store water in a special chapter.

Open-pollinated seeds for gardening. I recommend that you store a variety of seeds for gardening. Use open-pollinated seeds, not hybrids, so you can save seeds from your garden for future needs, if necessary. *Do not eat seeds for planting! If they are dyed a bright color, they may be poisonous. Also, they will provide a hundred times more nutrition after the harvest than if eaten first.*

How to build a Greenhouse

Building a greenhouse is not new, but now the possibilities of growing home food are right in front of us and more and more people consider going this path for the good of their families.

Prior to embarking on your greenhouse project, you must do proper planning as this would save a lot of hassle as well as money. The design of your green would depend on your home's architecture, space, the plants that you plan



to cultivate and the available budget. The greenhouse must be able to provide a suitable environment for the plants it is intended for.

To construct a greenhouse for your home, you would need a sheet of Universal Canopy, around 10 x 20 feet in size. You would also need 6 mil clear plastic roll, about 20 x 100 feet in size, 4 to 8 T-Posts, 15 to 20 Squeeze Clips, 18 Ratcheting Tie-downs, 1 roll duck tape, 3 rolls Heavy Duty 3M Clear Tape. You could also include heaters, fans, and gro-lights as an option.

Once you have the aforementioned paraphernalia, you could proceed by following the guideline given below:

1. First of all, set up your frame, and as you insert each piece wrap the connection point with 2 or 3 rounds of Duck Tape.
2. Next, attach the Tie downs by staggering all of them evenly over the top of the frame. Make the straps tight, but don't bare down and over tighten.
3. Use at least 4 T-post to anchor the 4 corners of the greenhouse. Place the T-post on the inside and drive at least 12" in the ground.

Then wrap at least the top 24" with Duck Tape to secure and eliminate any sharp edges.

4. Now splice two sheets of plastic in order to achieve full coverage (unless you found bigger plastic). Cut 2 pieces of plastic at 30 feet. This will give you two, 20' x 30' pieces. You will splice the 30' sections, giving you one big sheet of 38' x 30'.

5. Allow the plastic to touch the ground on the end caps, but if your overlap was too much and it won't reach the ground on both ends. However you can make your own end caps or doors with the extra plastic.

6. Use the clips to attach the plastic to the pipe legs. Clip everywhere you think it needs it. Any tears caused by the clips can be fixed with heavy duty clear tape.

Once you have successfully followed all the aforementioned steps you have constructed your very own greenhouse. Congratulations!

Calculating a Year's Food Supply

Because most stored food has a limited shelf life, you are throwing money away if you do not store food that your family will eat. The chart on the next page shows storage quantities for one typical adult American male, for one year, consuming roughly 2,500 calories per day. Divide these numbers by 12 for a one-month supply and by 52 for a one-week supply. Since not everyone has the same food

requirements, refer to the family factors chart to estimate how much food you should store.

Totaling the values will give you the equivalent number of typical adult males, which you will multiply by the figures for the various foods (see example below table).

Make your own adjustments based on family members, such as counting a teenage female with an unusually large appetite the same as a teenage male (equal to 1.4 typical adult males).

Food storage quantities for one average adult male for one year

Grains-325 lbs. You will probably want to store a variety of grains, including whole wheat, pasta, oats, corn, rice, barley, and so on. Due to wheat's longevity, most long-term storage plans focus on it. Whole grains can be sprouted, increasing their food value.

Legumes-80 lbs. (dry). Many different varieties of beans, peas, lentils, seeds, and so on. Soybeans offer very high protein content, but it is a good idea to store several other legumes for taste and variety.

Milk, dairy products, and eggs-50 lbs. (dry). Nonfat dry milk keeps longer than dried whole milk. Dehydrated eggs and powdered milk greatly expand your cooking possibilities. Also, you can make a variety of cheeses from powdered milk.

Meat and meat substitutes-20 lbs. (dry). Dried vegetarian meat substitutes and freeze-dried meats are very light. They are best cooked into stews and soups for extra flavor.

Fruits and vegetables-10 to 30 lbs. (dry). Traditionally, dehydrated fruits and vegetables are much less expensive than freeze dried.

Sweeteners-60 lbs. These include sugar, honey, syrups, and so on. Honey is preferred for its nutritive and antibiotic values.

Fats, oils and shortenings-40 lbs. (5 gal).

Includes butter, powdered butter, shortening, cooking oil, nut butters, and so on. Hydrogenated processed oils are nonnutritive, but last for years (bacteria can't eat them, and our bodies can't do much with them either). Cold-pressed oils, such as olive and safflower provide essential fatty acids that your body needs to metabolize foods, but do not last as long. Storing a combination of hydrogenated oils and cold pressed unprocessed oils offers a blend of good nutrition and longevity.

Sprouting seeds and supplies-20 to 50 lbs. Provides live foods and essential vitamins. Great for variety and nutrition. For best results, use untreated organic whole grains, beans, and seeds. I suggest alfalfa seeds, all types of whole grains, mung beans, soybeans, lentils, and cabbage, radish, and broccoli seeds.

Leavenings-1 lb. (minimum). Includes dry active yeast, baking powder, and baking soda.

Miscellaneous foods. Includes spices, cocoa powder, seasoning sauces, condiments, vitamins, minerals, other nutritional supplements, and so on. Include at least 5 lbs. of salt.

Calculating food requirements

Food factor

Multiply the number of adult males X 1.0

Multiply the number of adult females X .85

Multiply the number of teenage males X 1.4

Multiply the number of teenage females X .95

Multiply the number of male children (7 to 11) X .95

Multiply the number of female children (7 to 11) X .75

Multiply the number of children (4 to 6) X 0.6

Multiply the number of infants (1 to 3) X 0.4

Equivalent adult males

Total

*For example, if the members of your family consist of: 1 man (1.0), 1 woman (0.85), 1 boy between ages 7 and 11 (0.95), and 1 other child between 4 and 6 (0.6), your family should store the amount of food needed by the equivalent of 3.4 men. So, 325 lbs. of grain X 3.4 (adult male equivalents) = 1,095 lbs. of grain to feed your family of four for one year.

Food Storage Tips

The main culprits responsible for destroying your food stores are time, moisture, heat, oxygen, mold, and pests. Poor food selection

and improper packaging can compound the problem. Time is always working against you. Try to store what you normally eat, so you can rotate stocks. Do not store dented cans or other goods with damaged packaging. Molds can grow in low-moisture environments and are extremely toxic. *Do not eat moldy foods or food from bulging cans—sickness or death may result.*

Keep stored foods cool, clean, dark, and dry. Try to keep them below 70°R. The optimum storage for most non-frozen foods is 35 to 40°F. Shelf life decreases by 50% for each 20-degree increase, even for canned foods. Moisture, food, oxygen, and above-freezing temperatures are the key ingredients insects need to grow. A few bug eggs, once they hatch, can rapidly destroy a sealed container of dry food, if they have an adequate supply of oxygen and moisture. Sunlight also contributes to the degradation of many stored foods.

Store foods in manageable sizes of containers. If you are packaging food yourself, I recommend #10 cans (approximately 1 gallon) or the 5-gallon size. Garbage cans will not keep critters out without airtight liners. They are heavy to move, and you risk losing large amounts of food from a single contamination.

Commercial foods are generally free of pests, but paper packaging will not keep pests out for long. All goods packaged in paper, or other flimsy materials, must be repackaged for long-term storage. Mice, rats, cockroaches, and beetles are "dirty" pests that carry diseases. The foods they have spoiled should be discarded. Weevils, found in many flours and grains, are "clean" pests and are not harmful if consumed.

You can freeze containers of food to destroy living insects, but this will not usually kill their eggs. Refreeze the container after 30 days to destroy bugs that have hatched. Freeze in an upright or chest freezer (not the freezer section of a standard kitchen refrigerator) for 72 hours at 0°F or lower.

You can heat dry food in an oven to destroy living insects, but this method may also kill "live" food. Pour infested foods into shallow pans to a depth of *Vi* inch and bake for 15 to 20 minutes at 150°. *CAUTION: Foods will scorch if left in Hie oven for too long.*

Do not store food containers directly on concrete floors, due to moisture wicking from the floor. Stack on wood slats for ventilation and reduced moisture.

Use dry ice, vacuum packaging, oxygen absorbers, or nitrogen packaging to reduce oxygen levels, kill pests, and increase the longevity of stored dry foods. You can package foods yourself using these methods (except for nitrogen packing, which requires commercial equipment), or purchase prepackaged foods from preparedness/ survival suppliers.

You can dust grains, legumes, and so on with diatomaceous earth to kill bugs when they try to eat your stored food. Diatomaceous earth, available from most garden supply, hardware centers, and building supply stores, is deadly to bugs but nontoxic for humans and animals. It is a good source of silica (helpful for mending bones and joints) and is formed from the shells of single-celled diatoms.

These diatom skeletons contain microscopic sharp edges, which wreak havoc with little critters' insides, but have no harmful effects on humans'. Insert VA cups of diatomaceous earth for each 5 gallons of food, then shake, stir, and roll the container until all the contents are thoroughly dusted. Diatomaceous earth is easily rinsed from stored food prior to cooking.

CAUTION: If you rely on frozen food for long-term storage, ensure that you have an adequate source of backup power to prevent losing your food stores to a long term power outage.

Dry Ice Fumigation

A good way to repackage dry foods and protect them from pests is with dry ice fumigation. Dry ice is frozen carbon dioxide. A properly-sized block of dry ice, placed on the top or bottom of a container of dry foods, will gradually evaporate (dry ice melts straight into gas through a process called sublimation).

As it evaporates, the heavier-than-air carbon dioxide floats the lighter air out the top of the container. Bugs cannot live in an atmosphere of carbon dioxide. Dry ice can be stored for a short while in an ice chest (use no regular ice or liquids with the dry ice) and is available at most supermarkets and restaurant supply stores.

Wrap it with news paper for handling. Break it into appropriately-sized chunks with a hammer and chisel or screwdriver.

CAUTION: Do not handle dry ice with bare hands! Contact with bare skin immediately results in frostbite!

Place a properly-sized block of dry ice (see chart below) on the top or bottom (preferred for most thorough purging) of a container of dry foods. If frost crystals are present on the surface of the dry ice, wipe clean with a cloth to prevent the introduction of extra moisture into your food. Press the lid down gently, leaving a small gap for air to escape. After 20 to 30 minutes, check to see if the dry ice has fully evaporated.

If it has, seal the container. For the bottom-of-the bucket method, seal the container after 20 to 30 minutes. If the lid pops off, or the container bulges, crack the lid open and try again in five minutes. NOTE: For the dry ice method to be effective for the long term, the container must be airtight.

Vacuum Packaging

Vacuum packaging removes the oxygen and excess moisture from dry foods, killing critters and extending shelf life. A simple, but only partially effective, vacuum packing method is to pack food in plastic bags and suck as much air out of the bags with a soda straw as you can, prior to sealing the bags. Heat sealers are the most effective vapor barrier, with zip locks a second best. Modestly priced electric and hand-operated vacuum pumps are available for vacuum packing goods in jars, cans, and bags for long-term storage.

Shelf Life Guide

The following list is for foods stored at room temperature (70° F). Shelf life decreases by roughly 50% with every 20-degree increase in temperature.

The ideal storage temperature for most non-frozen foods is around 35° to 40°F. Remember, whenever possible, keep cool, dark, and dry (CDD). Once a container is opened, the contents may not last long. I suggest dating containers with a grease pen, so you can change markings if the container is opened or reused. Many dry or canned foods will last longer than their official shelf life, but *can't be relied on* to last longer.

- **Indefinite.** Indefinite means that under the right conditions, these materials will last a very long time, possibly longer than you live. Honey, sugar, salt, soy sauce, apple cider vinegar, black pepper, Worcestershire sauce, and properly packaged wheat fall into this category.
- **5 to 10 years.** Most dried legumes and most whole grains are in this category, as are dehydrated cheese, instant coffee, vacuum-packed coffee, baking powder, powdered eggs, and frozen butter.
- **Up to 5 years.** Processed (partially hydrogenated) liquid vegetable oils, Crisco shortening, cornmeal and corn flour, and nonfat powdered milk.
- **2 to 3 years.** Bouillon cubes, corn starch, white rice, powdered gelatin, white wheat flour, white flour pasta (dry), tapioca, textured vegetable protein (TVP), hydrogenated peanut butter, catsup, canned salmon and sardines, most other canned foods except for meats, some fish, and fruits. Sprouting seeds, such as alfalfa, mung, soybean, wheat, and so on, will keep for two to three years.

- **Up to 18 months.** Canned meats, canned seafood (halibut, mackerel, tuna, and shrimp), unshelled raw nuts, dry active yeast, bag-packaged snack chips, cake mixes, dry puddings, herb teas, black teas, bottled juices, most seasonings and extracts, jams and jellies, canned non-citrus fruits (blackberries, blueberries, cherries, pears, peaches, plums, etc.), cranberry sauce, pickles, canned rhubarb, and sauerkraut.
- **1 year.** Canned nuts, packaged dry breakfast cereals, rolled oats (oatmeal), bottled dressings, mayonnaise, natural liquid vegetable oils, candy bars, bottled juices (grapefruit, pineapple, apricot, and orange), most dried fruits, canned citrus fruits, and natural nut butters.
- **6 months:** Most store-packaged food in boxes, fresh potatoes (keep cool, dark, and dry), granóla, shelled raw nuts, and unshelled roasted nuts.

Water for your family

Next to oxygen, water is the most vitally important substance in the body. Your existence on earth depends on WATER! This magical liquid helps you every day to enjoy a more vital, joyous and prolonged life on our precious earth!



Water shapes the earth, controls the climate and provides man with food and a prodigious amount of energy. The body is 70% water,

which is the source of all life. Water performs and supports the internal body functions of humans, animals and maintains plant life!

Turning the faucet is so easy, but learning the threats that can come from this simple action are most of the times ignored.

While it is not possible to try and provide security for all of the supply sources, the security around water treatment facilities is often quite high.

Why? Because these facilities have often been the focal point of terrorists' plans. They would easily be able to taint the water bound for the homes of tens of thousands– or even millions – of people.

Other threats include a failure of the electrical grid, a natural disaster that caused severe flooding or an accident at the water treatment facility that damaged vital equipment. There are many things that can go wrong at the water treatment plant level. Yes, there is increased security, but security is not foolproof and, obviously, security cannot prevent accidents and natural disasters.

Ways to Purify Water

Besides boiling, which is the safest method for purifying water, here are other ways to do this:

1. Alum. If water is muddy, floating clay particles can be settled out by adding a pinch of alum. This, however, requires at least 12 hours waiting and lots of wood!

Polluted or dirty water can be filtered by straining through closely woven garments such as a felt hat or a pair of thick drill trousers. This will remove sediments only, not purify.

- Let it rest during 12 hours.
- Let it circulate inside a bamboo stick or other tube measuring 1 yard, filled with sand and the end packed with grass.
- Then pour water through a cloth filled with sand which filters the mud.
- Boil that water afterward for a minimum of 10 minutes.

2. Filtration. Water can be cleared by filtration although this process will neither affect any dissolved minerals nor ensure purity. Water is polluted by animal and mineral matter rather than by discoloring vegetable substances such as grass roots and dead leaves.

The first two can't be removed with any sureness by ordinary filtering. This filter is to clear water by straining it through solid material.

A "wild" filter can be made without too much trouble particularly in sandy areas by scooping a hole a few feet from the source of supply and letting the water seep into it.

3. Hot stones. Polluted water can be sterilized by adding hot stones to the water in the filter.

The water will soon boil becoming sterile and safe drink.

In areas where there is the likelihood of water being unsanitary (near cities or villages), it is always safer to boil before drinking or add a pinch of chloride of lime.

Water which is very muddy, dirty or stagnant can be clarified through a good filter made from a pair of drill trousers with one leg turned inside out and put inside the other leg.

The cuff is tied and the upper part held open by 3 stakes driven well into the ground. Fill with the dirty water and then drop in the hot stones.

The water will filter through and **MUST** be caught by a container and poured back until the dirt has been filtered. Boil the water at least 10 minutes. Remember, just moistening your lips with polluted water can make you sick for days; it can even kill you.

4. Chemical. One can buy the chemicals at most sporting goods and drug stores. Since their purifying action depends upon the release of chlorine gas, the tablets should be fresh and the container kept tightly closed, its contents dry.

Note

NO PURIFICATION OF WATER BY CHEMICAL MEANS IS AS SAFE AS BOILING.

Two tabs of Iodine will ordinarily make a quart of water safe for human consumption in 1/2 hour.

If the water is muddy or its integrity seems particularly questionable, it is good insurance to double at least the amount of Halazone and standing time to be sure.

Care **must** be taken with chemical purifiers to disinfect all points of contact with the container, so that the sterilized water will not be easily reinfected.

If a jar or canteen is being used together with Iodine, replace the cover loosely and wait 30 minutes so the tablets can dissolve. Then

shake the contents thoroughly, allowing some of the water to spill out over the top and lips of the holder. Tighten the cover and leave it that way for the time required before using any of the water.

- ✓ **Chlorine.** Chlorine in some form is regarded as the most dependable disinfectant for drinking water. When introduced in proper quantities, it destroys any existing organisms. For as long as enough remains in the water, it prevents recurring contamination. It is better to err moderately on the side of over-dosage than not enough.

Emergency chlorinating done in 3 simple steps

- 1) Dissolve one heaping tablespoon of chloride of lime in 8 quarts of water.
- 2) Add one part of this solution to 100 parts of the water to be disinfected.
- 3) Wait at least 30 minutes before using. The stock solution **must** be kept tightly corked in a cool, dark place and even then, it should be frequently renewed.

Tincture of iodine can be used as an emergency purifier. A drop of this fresh antiseptic, mixed thoroughly with one quart of water in the same manner as the old Halazone pills, will generally make the water fit to drink in 30 minutes.

Both the amount and time may be doubled if this precaution seems warranted.

- ✓ **Iodine.** Chlorine-releasing compound cannot be relied upon in semi-tropical and tropical areas. Water in those regions **must** be sterilized either by boiling or by iodine water purification

tablets containing the active ingredient Tetraglycine Hydroperiodine, These measures have been adopted as standard by the armed services of the USA. These tablets have been proved effective against all the common water-borne bacteria. Added to water each tablet frees 8 milligrams of iodine which act as a water purification factor. One tablet will purify one quart of water. These tablets too **must** be kept dry. The bottle **must** be recapped tightly after opening.

- ✓ Add one tablet to a quart of water in container with cap.
- ✓ Wait 3 minutes.
- ✓ Shake water thoroughly, allowing a little water to leak out and disinfect the screw threads before tightening the cap.
- ✓ Wait 10 minutes before drinking or adding beverage powders and if water is very cold, wait 20 minutes.
- ✓ If water contains decaying vegetation or is murky and discolored, use 2 tablets for every one quart.
- ✓ Make certain that the iodine disinfects any part of the container which will come in contact with your lips.

Other chemicals to sterilize water

- ✓ JAVEL: Add 5 drops of Javel per 4.5 liters of water **never** pass that dosage. Its drawback is that water tastes acidic.
- ✓ "Permanganate de Potasse": Drop a piece of it in the water in a way that the water is **hardly** tainted and wait 1 hour before drinking.
- ✓ In South America, people purify water ponds with copper sulphate 1 million parts to one part of water.

Filters: Keeping quality water filters in your emergency supplies is absolutely essential.

A number of filters are available and some are much more effective than others. It is very important that you research the specific filter that you are considering. Some of the features that you need to understand are listed below.

- Capacity
- What types of particulates will be removed
- How much replaced filters or media costs

For any filters that you have in your supplies, be sure to also keep several replacement filters as well.

Distillers

Distillers purify water by turning it into a vapor, separating it from impurities and then turning the vapors back into liquid form.

The best way to treat water involves using both a filter AND a distiller. Note that some filters and distillers will require electricity in order to operate. If yours does, you should also have a back-up filter on hand that does not require power. That way if the power is out, you will still have a way to treat your water.

Bad water diseases

Diseases from water make one of the greatest threats to survival, if not *the* greatest, immediately following injuries, cold and man! Among them we find: Dysentery, Cholera, Typhoid, Douves.

Dysentery

This sickness causes general diarrhea, painful and of long duration with bloody stools and weakness. If you think you suffer it, eat frequently and drink, if possible, coconut milk and boiled water. As for coconut milk being a laxative, drink only a small amount. Boiled rice is strongly recommended as food during this illness.

Cholera and typhoid

Even with vaccine, you are vulnerable to these diseases if proper care isn't taken of water drinking habits.

Douves

They abound in stagnant and polluted water especially in the Tropics. When you swallow them, they infiltrate the blood causing severe sickness and often death. These parasite worms penetrate the body even through the skin. Don't walk or bathe in contaminated waters. Nowhere does the addition of liquor to ice or water rid either of germs. (Germs keep well in ice; they don't die).

Leeches and how to get rid of them

The small leeches abound most particularly in water streams of Africa. When swallowed, they cling to throat and nose passages. They suck the blood and cause wounds. These parasites move and each time they do, they cause new open wounds which leads the way to infection.

Clean your nose as quickly as possible by sniffing very salted water or remove the leeches with improvised tweezers or with the heat from a cigarette. Another old jungle trick is to rub salt on them which will make them leave.

Deadly hazards of fluoridated water

Forty-one of the 50 largest cities in the U.S. have fluoride, a deadly hazardous waste, in their water. Millions of gallons of this deadly poison are doing irreparable damage by mass medicating everyone who drinks fluoridated water. Let's get this toxic chemical out of America's water supply! If the water in your area is fluoridated, join or start action groups to remove this dangerous chemical now to save yourself, your family and the lives of future generations!

Dangers:

- ✓ Digestive system disorders: Ulcers, colitis, constipation, nausea, cirrhosis, hepatitis and inability to utilize vitamins B and C.
- ✓ Kidney, bladder and urinary disorders.
- ✓ Respiratory and lung disorders: Tuberculosis, asthma, rhinitis, sinusitis and bronchitis.
- ✓ Circulatory diseases: Arteriosclerosis, heart failure, varicose veins, coronary thrombosis, hypo-tension and hypertension.
- ✓ Blood conditions: Leukemia, hemophilia and anemia.
- ✓ Mental and neurological impairments and disorders: Alzheimer's, neuroses, psychoses, A.D.D. & multiple sclerosis.
- ✓ Eye diseases: Cataracts, vision problems, glaucoma and detached retina.
- ✓ Endocrine dysfunctions: Diabetes, goiter, and impaired function of the adrenal, thyroid and sex glands.
- ✓ Skin, nail and hair conditions: Acne, boils, dermatitis, eczema, alopecia and lupus.
- ✓ Bone and joint conditions: Osteoporosis, bone cancer, arthritis and aching joints.

- ✓ Teeth and gum diseases: Mottled and darkened teeth, calcium and bone loss.
- ✓ Premature and still births, hearing loss and headaches.
- ✓ CANCER in all its forms

You will need to decide how much water that you need to store based on the size of your family and the number of days' worth of water that you want to store. Since this guide is for a 72 hour crisis, let's use that as a guide.

It is recommended that you store a minimum of one gallon of water per person per day. While this is enough to sustain you, you may want to consider storing two gallons per person per day. This will allow not only plenty of water for drinking, but also for hygiene, cooking and other uses.

You also need to keep enough water to care for pets or barnyard animals that you have on your property. This could significantly increase the amount of water that you need based on the number and types of animals.

Rotate Stored Water

While water does not technically "go bad," it can get stale. That is why it is a good idea to rotate your stored water. Whether you keep your water storage in plastic bottles or large barrels, rotating the water on a regular basis will ensure that your supply stays fresh.

Containers

Be sure that the containers that you choose are made of food-grade plastic. Not all plastic barrels are appropriate for storing water. Also, a dark container is better than clear plastic as it will keep out the

light, which contributes to algae growth. With store-bought plastic water bottles, it is best to store them in as cool and dark a spot as possible.

If you have large barrels as part of your water storage, make sure that you also have a pump on hand so that you will be able to easily access the water during an emergency.

Sourcing water

Not everyone is lucky enough to have a good water source right on their property, but that doesn't mean sourcing water is as difficult as you might think. Here are some places that you can source water:

- Rivers, ponds, streams, lakes
- Rainwater collection system
- Underground water collection system
- Swimming pools

Anyone can set up rainwater and underground collection systems on their property. If you do not have a river or similar water source on your property, but there is one nearby, this is an option. You will need a way to get the water from the source to your home, such as transporting it in buckets or barrels.

Rainwater Collection

A basic rainwater collection system can be put in place quickly and easily. Simply redirect one your rainspouts to a barrel or other collection container. Obviously, the larger the container, the more water you will be able to collect.

There are systems available that will allow you to collect rainwater in large underground tanks. A more basic option is collecting the water in barrels. In this case, you want to have several barrels on hand so that you can remove a full barrel and replace it with an empty barrel during a good rain. This will allow you to collect as much rainwater as possible.

Underground Water Collection

An underground water collection system will not yield a large amount of water, but during a crisis, every drop of water counts. This is especially true if you did not manage to have sufficient water in your water storage.

Typically, an underground water collection will give you about a quart per day. Setting one up is easy, and can be completed with items that you probably have around your home.

- Select a low-lying space on your property. The spot should also get a good amount of sun during the day.
- Dig a hole that is roughly 15 inches deep. If your hole is not 15 inches, you are not likely to collect any water. The hole should be in a bowl shape.

Place a container in the center of the hole. A small container will suffice, considering the small amount of water that you can expect.

- Cover the hole and the container with plastic sheeting, such as a tarp, and secure using heavy rocks placed around the perimeter.

The next day, you should be able to return to your collection system and find some water in your container. This works by directing the condensation to the container. You can collect more than a quart per day using this method by setting up several collection sites on your property.

As is the case with all sourced water, you will need to treat the water before drinking. Water collected through an underground collection system may contain high levels of bacteria, so be sure to treat using a quality method.

During a true survival situation, you will need to get water anywhere that you can. In addition to the sources listed above, here are some other methods of finding water that survivalists keep in mind for those times when all else fails:

- **Cactus:** If you live in an area where cacti grow, it is important that you become familiar with the different types. The water found in some cacti is poisonous, so make sure you learn which types are safe to drink from. You will need a machete to extract water from a cactus, so be sure to keep one in your emergency supplies. If you live in an area where collecting water from cacti may be an option, learn the correct method of doing so. Otherwise, you may waste what little water may be stored in the cactus.
- **Hot water heater:** Keep a hose or pump in your emergency supplies that will allow you to access the water stored inside of your hot water heater.
- **Urine:** In very extreme situations, you can drink urine when no other water is available. If this is necessary, you should drink the urine right away and not allow it to sit around. This is to

prevent bacteria from growing. If you have a high quality filter, use it to clean the urine as much as possible before drinking.

- **Swimming pools:** Swimming pools were mentioned above. If you have a swimming pool on your property, you should be sure to get a filter that can treat chlorinated water. This will ensure that using your pool water will be an option during a water crisis.

Herbal medicine for your family

One of the major concerns with survival preparation is being able to sustain without needed medications. If you find yourself in a situation where you do not have access to necessary pharmaceuticals it is easy to become panicked. The good news is that there are alternatives to traditional meds that can be just as effective and even less toxic to your body than the traditional drugs your doctor has prescribed.



There are several items that are good to keep around for everything from minor abrasions and burns, to stopping excessive bleeding and even reducing physical and emotional trauma. In this chapter I will share with you what I believe to be imperative alternative medicines to have around in any emergency situation as well as some alternatives to traditional medication.

Storing plants

The best way to store your herbs is once they have been completely dried so that you are certain that they will not mildew or mold, in glass containers that are air tight. Herbs that are stored in dry air tight containers and are stored in a dark cool room will keep will keep for several years.

If herbs are not stored in an air tight container or are stored in direct sunlight, they will lose their potency after a short period of a few months. It is not necessary to go to the expense of buying dark amber glass. If you have some, it will be fine to use it, but it is expensive and you may simply store your herbs in jars such as canning jars or similar type glass jar that you can close tightly. All the amber is for is to keep out the light.

You can place your herbs in clear jars and put them in cupboards that have closing doors so that they are stored in the dark. It is essential that they be stored in a room that is fairly cool. It is not recommended to store your herbs in paper or plastic. The paper will allow the volatile substances to evaporate. The plastic, even though it may not allow substances to evaporate from the herbs, there is a potential for the plastic resins to contaminate the herbs that are stored in them.

If you have been storing herbs in the proper way and you are afraid that perhaps they may have lost some of their potency, maybe it has been around 3-4 years that you have been storing these things, you have the choice of either throwing them away or determining how

much of their potency they may have lost and just taking a larger quantity of the herb to make up for the loss in potency.

How to prepare and use herbs

Effective herbal remedies can be prepared at home, but the dangers of self-diagnosis cannot be stressed too highly. Any unusual medical problem should be diagnosed and treated by a qualified medical herbalist, or a conventional medical doctor.

That is why it is important to prepare them correctly. Some methods are listed below.

Decoction

This is herbal tea referred to using the solid parts of plants such as the nuts, roots, rhizomes, barks, seeds and heavy stems. It takes physical action to extract the beneficial properties from these parts of the plant, hence it will take a different action than when making an infusion.

To make a decoction we place the plant particles in a pan using 1 teaspoon per cup of water. Bring this to a low simmer for 10-30 minutes. Smaller particles and powders require the least amount of time, larger particles such as shredded barks and roots require the maximum time not to exceed 30 minutes.

Infusion

Infusion is the terminology used to define an herbal tea. But it specifically refers to the parts of the plants that are used and describes a precise method of preparing those parts that will

maintain their effectiveness. In making infusions we will be using the aerial or the lighter and upper parts of the plant. These parts contain volatile oils that if not prepared carefully will be damaged or destroyed.

These parts may be used in a fresh or dried form. If using a fresh form you will need to use twice as much. Place your herbs, usually 1 teaspoon per cup of water, in a cup, pour boiling water over them, cover the cup and let it steep until cool enough to drink (15-20 minutes).

Sometimes we find it necessary to make infused oil. To do this, place your herbs in a high quality vegetable oil such as olive or corn oil. Place in a glass jar, cover and leave it in the sun for 10-14 days, shaking daily. The sun will cause an extraction process, and will infuse the herb into the oil.

At the end of the days you can strain and store the oil preferably in the refrigerator so it does not get rancid. You may accelerate the process by taking your glass jar containing your prospective infused oil, set it in a pan of water with the lid loose on the jar. Bring it to a low simmer maintaining this heat for approximately 2 hours. Remove the jar, strain the infusion after it is cool and you will have accelerated greatly the process of making infused oil.

Infusional-Decoction

Sometimes you will find that it is necessary to combine the effects of the aerial part of one plant with perhaps the bark of another. In doing this you will be making an herbal preparation called an infusional-decoction.

You have two choices. You can make the infusion of the aerial parts of the first plant in one pan and in a separate pan make a decoction of the other. Then mix the two together when they are finished. Occasionally when using this method we find that the volume of tea is too great to be consumed comfortably, so a second method is better.

The method that I use is to begin with the standard directions for a decoction. Once the decoction has been made and while it is still at the simmering temperature, remove it from the heat, place the aerial parts of the other plant into the already prepared decoction, place a cover over the container and let cool.

Salve

Take your infused oil and melt in some cocoa butter and a small portion of bees wax or paraffin. Allow it to cool and the result will be a salve. You will have to experiment with the proportions as they vary with the particular climate that you live in and your own personal preferences. You may extend the life of this product with a natural preservative known as vitamin E oil. Squirt several vitamin E oil capsules into the salve and mix it well. This will help prevent it from becoming rancid.

Tinctures

Tinctures are made using vegetable glycerine, alcohol, and sometimes vinegar as extractors and preserving solvents. You will place an herb or blend of herbs into one of these three solutions. Allow it to stand for 10 days, shaking it daily. During that time an extraction has taken place and the beneficial properties of the plant have been leached into the solution and are suspended.

Now strain or purify it and you have a preserved product that may be taken by drops.

The reason for using a tincture is to provide an element of ease for traveling. Proper dosages are more readily available and more convenient than when using infusions and decoctions. You can just put a few drops into your mouth and the application is finished.

They travel well in your pocket, purse or suitcase. You may also evaporate the alcohol off if this has been used, by putting your drops into a cup and pouring boiling water over it and letting it sit for about 10 minutes.

The most effective of these solvents is grain alcohol. If you are going to be using it internally make sure that it is not made with rubbing alcohol. It is typically made by home users with Vodka obtained from the liquor store. You may use vegetable glycerine, however; it does not extract as well even though it does store well.

The least desirable and effective on the list is vinegar. My preference has been to use grain alcohol for making tinctures. Tinctures may be made in a variety of strengths and manners. I will give you a suggested rule of thumb for making a tincture and you may adapt it to your own liking as you find it necessary.

For your first experiment with making a tincture take a one pint jar and put your powdered or cut and sifted plants in it. Pour grain alcohol over the top, stir it until it is thoroughly saturated, making certain that there is excess alcohol covering the herbs so that there is about one inch of clear free alcohol above the plant particles.

Place a cover on it and let it stand, shaking it daily for 10 days. You will notice that the plant particles will absorb some of the alcohol and will swell so that your one inch of free space will eventually be diminished by perhaps a half inch.

At the end of the 10 days you may strain the entire contents through a muslin cloth. You may find that you may need to wind it tightly and even do some squeezing to extract it all out and not lose any of it. It is recommended that tinctures be stored in amber dropper bottles or jars.

When herbal medicine is not for you

Herbal medicine is great, but there are times when you'd better stay away from it, to protect your health. Here is when:

- Avoid herbal preparations if you're pregnant or breast-feeding. Most herbs effects on the fetus are unknown. If you're a woman of childbearing age, use birth control when taking herbs.
- Don't use herbs for serious or potentially serious medical conditions, such as heart disease or bleeding disorders.
- Never let other people take your herbs or other medicine. Store herbal agents out of reach of children and pets.
- If you have questions about the herb you're taking, seek advice from a qualified health care provider. If your practitioner isn't knowledgeable about herbs, ask for a referral to someone who is.

Herbs that heal

Diarrhea

Diarrhea can be a very disturbing disease, but one incredible drink can get rid of it in an instance.

Buttermilk is one of the most useful home remedies in the treatment of diarrhea. Buttermilk is the residual milk left after the fat has been removed from curd by shaking. It helps overcome destructive intestinal flora. The acid in the buttermilk also struggle germs and bacteria. Buttermilk may be taken with a bit of salt three or four times in a day for controlling this disease.

Mint juice is also helpful in the treatment of diarrhea. One teaspoon of fresh mint juice, mixed with a teaspoon each of lime juice and honey, can be given thrice daily with brilliant results in the treatment of this disease.

Turmeric has proved to be one more valuable home remedy for diarrhea. It is a very valuable intestinal antiseptic. It is also a gastric stimulant and boost. One teaspoon of fresh turmeric rhizome juice or one teaspoon of dry rhizome powder may be taken in one cup of buttermilk or simple water.

Diabetes

String bean pod tea is an excellent natural substitute for insulin and highly beneficial in diabetes. The skin of the pods of green beans is extremely rich in silica and certain hormone substances which are closely related to insulin. One cup of string bean tea is equal to one unit of insulin. Cucumbers contain a hormone needed by the cells of

the pancreas for producing insulin. Onion and garlic have proved beneficial in reducing blood sugar in diabetes.

Recent scientific investigations have established that **bitter gourd** (karela) is highly beneficial in the treatment of diabetes. It contains an insulin-like principle, known as plant-insulin which has been found effective in lowering the blood and urine sugar levels. It should, therefore, be included liberally in the diet of the diabetic.

For better results, the diabetic should take the juice of about 4 or 5 fruits every morning on an empty stomach. The seeds of bitter gourd can be added to food in a powdered form. Diabetics can also use bitter gourd in the form of decoction by boiling the pieces in water or in the form of dry powder.

Another effective home remedy is **jambul fruit** known as jamun in the vernacular. It is regarded in traditional medicine as a specific against diabetes because of its effect on the pancreas. The fruits as such, the seeds and fruit juice are all useful in the treatment of this disease. The seeds contain a glucoside 'jamboline' which is believed to have power to check the pathological conversion of starch into sugar in cases of increased production of glucose. They should be dried and powdered. This powder should be taken mixed in milk, curd or water.

Underweight

Musk melon is one of the most effective home remedies for thinness. If the melon cure is properly carried out, a rapid gain in weight can usually be achieved. In this mode of treatment, only

musk melons are taken three times during the day for forty days or more.

In the beginning, only three kilograms of melons are taken daily for three days. Then the quantity is increased by one kilogram daily till it is sufficient to appease the hunger. Only the sweet and fresh fruits of the best variety are used in the treatment. It would be advisable to discuss this method of treatment with your doctor.

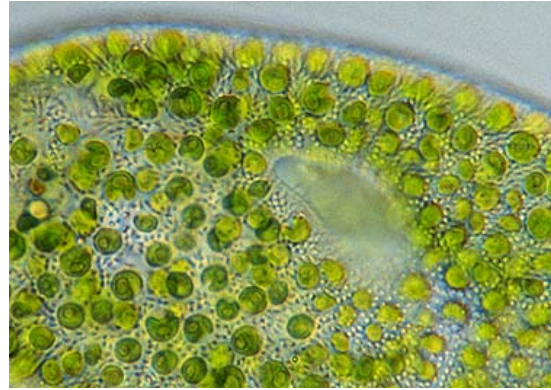
Additionally, you can follow this method for just a week or so, before including other fruits and vegetables in your diet for variety. You should also add plenty of avocados to your fruit platters, as this fruit contain several healthy fats.

One of the simplest ways to gain weight fast is to add a handful of crushed nuts to your meals and this method can be used by both men and women. **Nuts** are rich in several fats and vitamins and will help you to increase your weight in a healthy manner. You can also include crushed **flax** seeds in your meals as they are rich in omega fatty acids.

The **mango-milk** cure is also an ideal treatment for thinness. For this mode of treatment, ripe and sweet mangoes should always be selected. They should be taken thrice a day-morning, afternoon, and evening. Two medium sized mangoes should be taken first and then followed by a glass of milk.

Mango is rich in sugar but deficient in protein. On the other hand, milk is rich in protein but deficient in sugar. The deficiency of one is made up by the other. Mango thus combines very well with milk and

an exclusive mango-milk diet taken for at least one month, will lead to improvement in health and vigor and gain in weight.



An exclusive milk diet for rapid gain of weight has been advocated by some nature cure practitioners. At the beginning of this mode of treatment, the patient should fast for three days on warm water and lime juice so as to cleanse the system.

Thereafter, he should have a glass of milk every two hours from 8 a.m. to 8 p.m. on the first day, a glass every hour and half the next day, and a glass every hour the third day. Then the quantity of milk should be gradually increased so as to take a glass every half an hour from 8 a.m. to 8 p.m., if such a quantity can be tolerated fairly comfortably.

Figs are an excellent remedy for increasing weight in case of thinness. The high percentage of the rapidly assimilable sugar in this fruit makes it a strengthening and fattening food. Three dried figs soaked in water should be taken twice daily.

Detoxification

Many studies show that the vitamins, minerals, amino acids, chlorophyll and other substances in **chlorella**, a single-celled fresh water green algae, helps to detoxify the body. But it has been proven that it is the tough fibrous material in the outer shell that actually binds with toxins and carries them out of the body.

It is often included as part of a detox program to help remove heavy metals such as mercury, cadmium and lead, and pesticides, such as PCB's, and dioxins that accumulate in our bodies causing many health problems.

Most manufacturers break down the thick cell wall mechanically or chemically to make it more digestible and absorbable. New technology that uses sound waves to crack the hard wall claims to be best method as it preserves the vital nutrients inside.

A few people find they get some intestinal discomfort when taking chlorella and they probably lack the enzyme cellulase that would help digest the fibrous cell wall. Cellulase can be taken as a supplement which could help if you have this problem.

Chlorella Growth Factor

There are a number of different types of chlorella but Chlorella Pyreneidosa is considered the best for toxin absorption although it is harder to digest. Chlorella Vulgaris is higher in Chlorella Growth Factor (CGF) but has less metal absorbing capacity. CGF is a phytonutrient that stimulates tissue repair and healing.

Some researchers believe that aging is due to the increased breakdown of RNA and DNA , the genetic blueprint of the body. CGF contains RNA and DNA which can provide the building blocks for repair of our own genetic material.

Healing powers of Chlorophyll. Chlorella contains over 12% chlorophyll, the largest amount in any plant gram for gram. Chlorophyll is the substance that makes plants green and

photosynthesis possible – the process by which plants use the energy from the sun to convert carbon dioxide and water to glucose. The chemical structure of chlorophyll is very similar to the “heme” of hemoglobin in human blood. The only difference in the two is that chlorophyll has the mineral magnesium at its center and heme has iron in its center.

From studies in Japan where the interest in chlorella has focused mainly on its detoxifying abilities it seems that the detoxification effects are due to both the chlorophyll content and the substances in the cell walls. Chlorophyll carries oxygen which rapidly improves blood oxygenation and helps cleanse the body. Its ability to bind to and remove toxic heavy metals such as mercury makes it an extremely useful health.

Chlorella can be used as a **colon detox**. The cell wall material stimulates peristalsis, the wave like contractions of the colon, and it promotes the growth of the good intestinal bacteria.

How Much Chlorella Should I Take For Detoxification?

If you take 5 – 7 grams a day you should notice significant changes in your energy and overall health. It's best to start off with a much smaller dose and build up gradually as you could initially get mild diarrhea or bowel discomfort such as gas or bloating. Your body should adapt and you can gradually build up the dose.

Take it divided into 3 or 4 doses before meals and at bedtime. The chlorophyll will make your stools go green so if they don't you are not taking enough!

3 – 5 grams a day is a maintenance dose. You may not notice significant changes but your body should benefit from the nutrients and a slow gradual detox.

To fight disease 10 – 15 grams a day is a better amount. People fighting cancer have been known to take 20 grams a day.

Side effects from the detox of metals can be reduced by increasing the dose. The detox reactions come from the release of more toxins than the chlorella can bind so more is better not worse.

Chlorella comes in various forms from tiny tablets, capsules, powder to liquid forms often combined with other detoxifying substances. Taking the above amounts may mean taking a handful of tiny tablets.

Which chlorella should I take? Many inferior brands of chlorella sold on the internet have been found to be contaminated with toxic metals and pesticides that seep into the water it is grown in. Be sure to find one that is guaranteed free of these pollutants. It should be free of fillers, binders, coatings and preservatives. After all it is a natural food.

To get the best from using chlorella you should take it for 6 – 12 months and follow a good healthy diet high in fresh green vegetables, some fresh fruit, whole grains, nuts, seeds and free range grass fed meat if you are not a vegetarian.

Boost your immune system

The immune system needs to be boosted from time to time to protect us from harmful illnesses and even the common cold. You

can feed your immune system and keep it strong in various natural ways. But there is one secret that beats it all.

Garlic. This flavorful member of the onion family is a powerful immune booster that stimulates the multiplication of infection-fighting white cells, boosts natural killer cell activity, and increases the efficiency of antibody production.

The immune-boosting properties of garlic seem to be due to its sulfur-containing compounds, such as allicin and sulfides. Garlic can also act as an antioxidant that reduces the build-up of free radicals in the bloodstream. Garlic may protect against cancer, though the evidence is controversial. Cultures with a garlic-rich diet have a lower incidence of intestinal cancer. Garlic may also play a part in getting rid of potential carcinogens and other toxic substances. It is also a heart-friendly food since it keeps platelets from sticking together and clogging tiny blood vessels.



Anemia

Anemia is a medical condition in which the blood has a deficiency of red blood cells or of the hemoglobin these cells need to carry oxygen. Hemoglobin in the blood is measured to determine the presence of anemia.

The symptoms of anemia include weakness, fatigue, dizziness, headaches and heart palpitations. These symptoms result from the

body not getting enough oxygen through the bloodstream. In many cases, however, the symptoms are mild or unnoticed. It can become a life-threatening condition if left untreated for a long time.

The most common form of anemia is caused by iron deficiency. This can occur either through prolonged blood loss, as through heavy menstrual periods or slow bleeding ulcers or hemorrhoids. About ten percent of women in their childbearing years are anemic. Overuse of aspirin or ibuprofen can also cause internal bleeding which leads to anemia.

Other people who are at risk for anemia include smokers, alcoholics, vegetarians and people over 50. Anemia is often associated with serious illnesses, like cancer, lupus, and rheumatoid arthritis. Women need to be checked for anemia throughout pregnancy as well.

An herb that proved to be successful in curing anemia is **stinging nettle**. Take 10 ml of juice every day or an infusion made with fresh herb for one week and you'll be as good as new.

The homeland of nettle is Brazil and other South American countries. It is also abundant in Northern Europe and Asia. Nettle has a well-known reputation for giving a sting when the skin touches the hairs and bristles on the leaves and stems. It grows 2 to 4 meters. It has white, green and yellow leaves.

The body's natural immunity can also be increased with **Echinacea**. Echinacea is one of the most commonly used herbal products, but studies are mixed as to whether it can help prevent or treat colds. A meta-analysis of 14 clinical studies examining the effect of

Echinacea on the incidence and duration of the common cold found that Echinacea supplements decreased the odds of getting a cold by 58%. It also shortened the duration of a cold by 1.4 days.

Other herbal remedies

Angelica

Used to combat digestive problems, gastric ulcers, anorexia, and migraines. The root can be eaten as food but is also used as local anesthetic. Angelica's anti-bacterial properties also make it good for teeth. Just chew on the root.

Belladonna

Used to treat neuralgia, gout, rheumatism and sciatica, and to reduce muscle spasms.

Birch leaves and bark

The white birch tree, which thrives in the U.S. and Canada, provides leaves that heal rheumatism, arthritis, gout, arteriosclerosis, water retention, cystitis, kidney stones, skin rashes, psoriasis and eczema. The astringent effect of the tree's sap also helps tones the skin and combats oily and greasy hair.

Black Cohosh

A perennial shrub native to the eastern deciduous forests of North America and widely prescribed substitute for hormone replacement therapy. Also effective against PMS and other menstrual dysfunction.

Chamomile

Prescribed for fever, flu and to calm nerves. Also given to small babies and children for colds, stomach trouble and colitis.

Chickweed

For chest infections, hemorrhoids, varicose veins, psoriasis, inflammation, ulcers, vaginitis, boils, abscesses and allergies. An anti-inflammatory used to support healthy urinary tract function and cystitis. Also used to treat sore throat and flu symptoms.

Dandelion

A rich source of vitamins and minerals. The leaves are commonly added to green salads. Dandelion roots are brewed as a coffee substitute. As a blood purifier, dandelion aides liver, gallbladder and kidney function, especially in conjunction with Milk Thistle.

Eucalyptus

The oil of this plant is the key ingredient in products like Vics vapor-rub. The plant treats numerous symptoms in both humans and animals, including distemper, muscle aches and skin irritations. It's used as an antiseptic gargle and a stimulant to increase cardiac activity. You can also rub the oil on your temples and above your nose to relieve sinus pressure

Fennel

Fennel water mixed with sodium bicarbonate and syrup is used to treat flatulence in infants. Fennel tea is made by pouring half a pint of boiling water on a teaspoonful of Fennel seeds.

Feverfew

This herb is a preventative for migraine and numerous clinical studies have proven its efficacy. For best results, drink feverfew tea regularly as a preventative, since the plant is high in serotonin (for the actual headache, use willow bark and other pain-relieving herbs.) Feverfew also promotes the onset of the menstrual cycle.

Golden Seal

A natural antibiotic, Goldenseal is a multi-purpose remedy used to fight infection and fever-based illnesses. Like prescription antibiotics, you can develop a yeast infection from overuse, so use only when needed and remember to replace your pro-biotics with lactobacillus culture found in yoghurt or something similar. (Note: an ounce of chlorophyll extracted from a plant can be inserted in the vagina with a turkey baster to combat a yeast infection.

Lavender

An anti-viral and calming herb. Heat water, add the lavender, then breathe in the fragrant steam to cleanse the alveoli in the lungs, where respiratory infections begin.

Lobelia (a.k.a. Asthma Weed)

Helpful in treating asthma, epilepsy, tetanus, diphtheria and tonsillitis.

Milk Thistle

Aides nursing mothers with lactation. Studies have shown it to be extremely effective in promoting a healthy liver and healing any deficiencies in this organ.

Mustard seed

The mashed seeds are used as a poultice to relieve muscular and skeletal pain.

Nettles

Boil the herb and drink to combat anemia, hemorrhage (especially in the uterus), heavy menstrual bleeding, hemorrhoids, arthritis, gout and eczema. The roots are used to combat allergies and reduce prostate enlargement.

Herbal remedies tend to heal without suppressing symptoms, and used in the correct dosage are perfectly safe and have no side effects. Herbs are easy to find and can be used in cooking or in salads. Some, which you can grow in your garden, can be ground up and used as inhalants or to perfume a bath. Others - which are more likely to be in your kitchen cupboard - can be added to cooking or made up into poultices and muscle rubs.

As the methods of testing the compounds contained in many natural remedies become more sophisticated, many skeptics are beginning to sit up and take notice. And as more and more of our so-called 'wonder drugs' prove only to suppress symptoms rather than get to the root cause, it is little wonder that more and more people are now looking for a healthier option for everyday complaints.

The best thing about home remedies is that they are accessible and easy to prepare. However, remember: wellness is not limited to disease treatment and prevention, but also involves maintaining a healthy diet, getting adequate sleep and exercise.

Energy for your family

Let's assume that tomorrow a disaster would strike and your town lost its electric service. We saw it happening in the past and it will certainly happen again. So this time, are you prepared to give up the comfort of your energy dependent home?

If you are not ready for the possibility of disruptions, you could be faced with serious challenges to your present lifestyle. However, rather than speculate about which utilities and services might fail in your community, or in which



order they might be disrupted, you should simply anticipate that at some point in time you will lose each and every one of them.

Although it may seem unimaginable right now, this sort of inconvenience and hardship may be your future.

So, unless you are prepared to be completely self-sufficiency for water, heat, light, sanitation, and personal safety, your home could become quite unlivable.

So, how do you prepare for a situation like this? The answer is simple: **by divorcing the grid!** No longer will you have to rely on

the industries that control your energy and that are relying on oil, natural gas, coal and other harmful substances.

When it comes to solar energy, we all know there's lots of it just waiting to be harnessed. After all, the sun never stops shining. Even when it's cloudy out, UV rays are still beaming down to Earth.

To turn the sun's rays into electricity for your home, we have Photovoltaic technology, so you can easily generate your own electricity with solar panels. And this may not be news flash for you, but the idea of buying solar panels scares you, because paying \$27,000 on retail solar panels doesn't sound like a good deal.

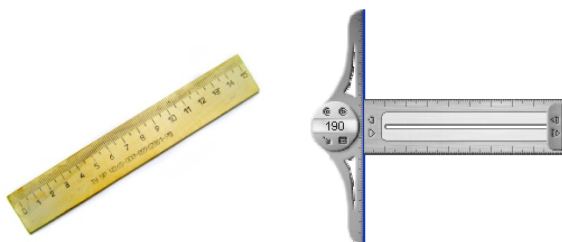
But who said anything about buying? What I'm about to show you is how to build your own solar panels. Fast, easy and straight forward!

First, let's have a look at all the tools and materials for the project:

Build your own Solar Panels

List of Tools

1. **Ruler/ Yardstick/ T-Square** – provides straight edge to layout Solar Cell Template



2. **Gloves (latex or vinyl)** – protects the Solar Cell from finger prints, blemishes and chipping



3. **Measuring Tape** – measures the components and construction for the PV panel



4. **Protective eyewear** – protects your eyes while soldering, steel cuts etc.



5. **Pencils/ Markers** – mark and layout the PV panel and the Solar Cell Pattern



6. **Speed Square (Carpenter Square)** – marks off crisp, sharp 90° corners and angles



7. **Soldering Iron/ Soldering Gun** – attaches the tabs to the individual Solar Cell and the stringers to the bus wires



8. **Battery Drill/ Drill Bits** – drills the holes in the Aluminum frame (Drill Bit sizes: 1/4", 9/32", 3/16")



9. **Hack Saw/ Chop Saw** – cuts the aluminum frame for the PV panel



10. **Files/Reamers** – ream out the holes drilled in the Aluminum frame and smooth off the edges of it



11. **Scissors/ Wire Cutters** – cut materials, tab and bus wires



12. **Tin Snips** – assist in assembly of the Aluminum frame



13. **Wrenches** – tighten and secure the nuts and bolts used for the project



14. **Small Table Vise** – holds items that we need to cut or work with



15. **Caulk Gun** – applies the Silicon to create waterproof seal



around the edges

16. **Slotted/ Phillips Screwdrivers** – attach the screws used in the project

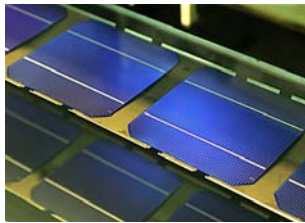


17. **Multi meter** – You can use it to see the voltage and amperage your panel is producing



List of materials

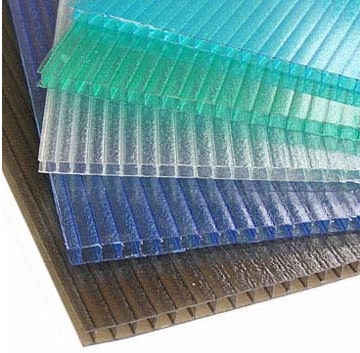
1. **Solar Cells 12.5 by 12.5 cm**



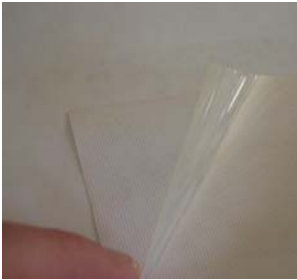
2. **Glass sheet 4mm thick (126x56cm)** – provides layout for the Solar Cells combined to create stringers



3. **Polycarbonate cover 8mm thick (126x56cm)** - covers the cells and protects your panel from the elements



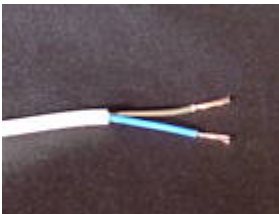
4. **Sticky paper** – sticks the solar cells to the glass



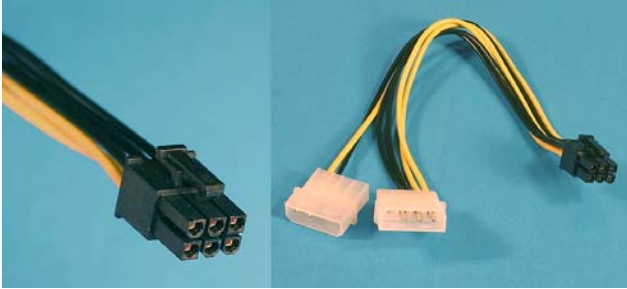
5. **Sponge Flooring** – protects the solar cells



6. **Cable 3 amps** – used for exit wires



7. **Connectors** – for the end of the exit wires



- 8. **Stainless steel screws 5mm** – used to keep the junction box in place



- 9. **Junction box**



- 10. **Aluminum "C" channel 2 by 2 cm** – frames your PV panel



11. **Tabbing wire** - connects the solar cells together. It is used in coordination with the solder iron or soldering gun and melts easily to connect to the solar cells. You will need two different sizes of wire with the thinner wire being used to connect each cell together and the thicker wire used to join the different rows of cells together.



12. **Solder** - attaches the copper wire to the back of each solar cell. It may also be needed to hold down some of the tin coated wire that does not stay down on its own.



13. **Silicon** – seals the aluminum profile.



14. **Flux Pen** - applies fusion to the PV cells and tinning wire so the solder will adhere to the tabbing wire PV cells



Construction

Our solar panel will be constructed based on a polycarbonate back side and a regular 4 mm glass for the front side. Cut the Glass to size: 126 x 56 cm.

The most important part of a solar panel is the individual solar cell. The cells are what turn the sun energy into usable DC power which we will then convert into AC power. We are using 12.5 cm by 12.5 cm cells.

You can purchase pre-tabbed cells which cost a little bit more, but we will use untabbed cells, so you can see how to join each of these together with tabbing wire.

The buss wire will be used to connect the cells at the end of the strings, which will be connected to the wires that exit the panel. For exit wires you can use 3 amps wires.

We are using 2 by 2 cm „U” aluminum profile to put a frame together and protect the cells.

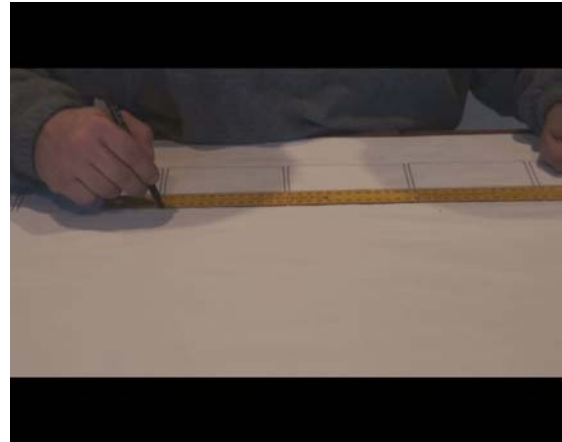
1. Sketching the pattern

Before starting to work with the solar cells we need to draw a pattern for our strings. We will need a sheet of paper for that. This will help us to create straight rows and to keep the space equal between cells.

First measure the width of your solar cells and make a mark.

Now start measuring the height of your solar cells and leave 0.5 cm between each cell.

Remember that we are using 12.5 by 12.5 cm solar cells for this project.

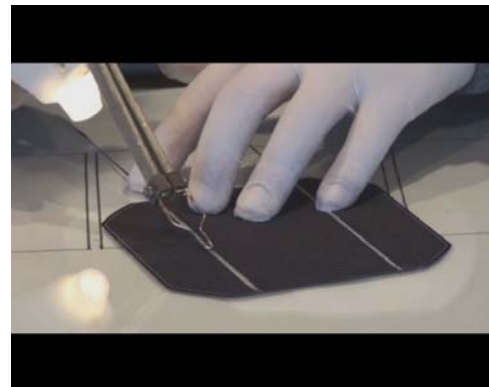


After making all the marks, start connecting the dots together to create your pattern.

The strings will have 9 cells each, but our sheet of paper is not big enough and we have room to draw just 7 cells. That's not a problem, because we will move the strings up when we get to solder the last two cells. Draw the rest of the lines to finish this pattern.

2. Attaching the tab wire to the PV cells

It's time to solder the tabbing wire to the PV cells. In order to do that, it's best you place the sheet of glass on top. This is a perfect surface to solder the solar cells without breaking them. Now you can put the gloves on and start working.



We are using untabbed solar cells which are less expensive than the tabbed ones. It will take some time to do that, but it's the perfect opportunity to show you how to tab solar cells.

Before soldering the tabbing wire, remember to use the flux pen to clean the contacts of the solar cells. To get the flux flowing, you need

to press a couple of times until the tip of the pen starts to turn yellow.

As you may already know, the top of the solar cell is negative and the other side is positive. We will talk more about that when we will start soldering the cells together, but now we need to solder the tabbing wire on each cell.

We will start cutting the tabbing wire, but first we need to measure it. The length of the tabbing wire should be twice the height of the solar cell. Since we are using 12.5 cm solar cells, the length of the tabbing wire should be around 25 cm.

Make a bundle of wire bent on 25 cm and when you make a cut on both ends, you will have more wires ready to be soldered on your solar cells.

Try to make the tabbing wire straight as possible to align it properly with the contact of the solar cell.

After the tabbing wire is aligned, you can start moving the soldering gun from one end to another. Do the same thing for the rest of the cells.

Consider wearing a mask, because the fumes from the soldering may give you headaches.

3. Connecting the PV cells to form strings

All the cells are tabbed right now and we can start soldering them together to create 4 strings of 9 cells each.

Lay the cell with the face down and start applying the flux to clear the contacts.

The solar cells will be soldered in series, so the negative wire of the second cell will be soldered with the positive contacts of the first cell.



The cells should be aligned properly to match the pattern. We will solder both wires at the bottom to make sure that the distance between them will stay the same. Now we can start soldering the rest of the tabbing wire applying heat with the soldering gun.

If the tabbing wire is too long, just bend the excess and it can be cut using the scissors.

Make the same thing with the rest of the cells until you get 9 solar cells in a row. Apply flux on the second cell and align the next one.

As mentioned before, our paper sheet is too small and we were able to draw just 7 cells. We will move the string up in order to solder the rest of two cells to complete this string.

Don't forget to apply flux, because it's very difficult to solder the wires on the contacts if you don't apply it.

At the last cell from every string you need to solder the exit wires. We already cut two pieces of tabbing wire 17 cm long. Apply flux and solder the wires in place.

In this way we will have the positive side on this end and the negative side on the other end of this string. Remember, the front of cell is negative and the back positive.

We will do the same thing with the other three rows.

After the strings are completed, we will remove them from the glass and using a cleaning solution we will make sure that the glass is clean and clear before going to the next step.

4. Connecting the strings in series

The strings will be soldered in series in order to get around 20 volts from our solar panel, enough to charge a 12 volt battery.



To connect the strings easier, the first string should be with the negative side on the top of the panel and the positive side on the other end. The second string should be arranged opposite the first row.

The 3rd string will be arranged like the first one. To make things easier, keep in mind that the 1st and 3rd string need to be arranged in the same way and the 2nd and 4th string need to be in the opposite way.

Now, it's time to connect the strings together.

We will measure 2.5 cm from the margins to make sure that there will be enough room for the aluminum frame. The width of the profile is 2 cm and we will leave a space equal with 0.5 cm from the frame to the string. Between each string we will have around 0.5 cm because in this way the solar panel will look very nice and compact.

At the bottom, the first two strings will be connected together using the buss ribbon, the wider buss wire.

We will measure the length between the first and the last tabbing wire and cut a piece long enough to connect these two strings together. Using the scissors, the excess of tabbing wire from the exit wires will be removed.

The strings 3 and 4 should be connected in the same way.

Next, we want to solder the exit wires for this solar panel. We are using a piece of buss ribbon about 13 cm long for this step.

We will leave the end that's inside longer, in order to connect the wires that will exit the case of our solar panel. We will do the same thing for the 4th string as well. One string will represent the negative side of our panel and the other will represent the positive side.

Now it's time to connect the strings 2 and 3 together. The solar panel should produce 19.5 volts and around 4.5 Amps, that's a total of 87.75 Watts.

5. Sticking the PV cells to the glass

We will start applying the sticker over the solar cells. This will stick to the glass and will keep the solar cells secured in place.

We have already cut it to size. We've left around 3 centimeters on each side to overlap it on margins.

We found an easy way to apply the sticker. The glass should be about 5 cm off the table to paste the sticker 2 cm on the face of the panel.



After that put the glass back on the table to keep that area pressed down when you will start pasting the rest of the sticker over the solar cells.

When the sticker is applied on the solar cell, there's no turning back, don't try to unpaste it if you've made a mistake because the cell will crack and you can ruin the entire project.

It's a good idea to have a friend assisting you when you are doing this step. If the sticker has been folded in some places, don't worry because it won't affect your solar panel and will not be visible after the solar panel is completed.

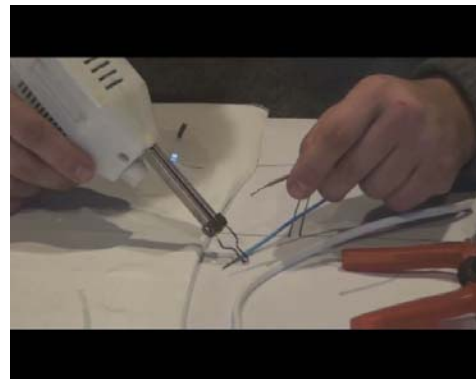
Take your time and don't rush when you are doing this process.

Make two cuts to get the exit wires. Now, press gently to make sure that the sticker is pasted everywhere. We will make a cut on each corner to overlap the sticker.

6. Soldering the exit wire

Before we continue, we will test now to see which side is the positive side. If it's showing a "Minus" on the multimeter, the leads are inversed.

In this case, where we have the black lead is the positive side of the panel and the wire where we placed the red lead is the negative side.



Then we will inverse the leads and try again. Now we can solder the wire which will exit the panel's case. We are using a 2 amps wire for

this process. We will peel off the ends of each wire and then apply some solder.

This way it will be much easier to solder the exit wires to the buss wires. We will apply some solder on the bus wire as well.

Put something under the buss wire when you start soldering the pieces together. We used the blue wire for the positive side and the brown one for the negative side.

7. Building the aluminum frame

It's time to start working on the aluminum frame which will hold our solar panel together.

We will start by measuring the height of the solar panel. The glass is 126 cm by 56 cm. We will add one centimeter to our measurements. So, we will have one aluminum piece of 127 cm for each side of the solar panel and another two for top and bottom which will measure 57 cm.

We are using this template to mark a 45 degrees cut. We will use the saw blade to mark the cut and then we will use the angle grinder to complete it.

Then we will file the edges to make them look right.

We will mark and cut the other end as well.



We have the other three sides left now. We will do the same process to finish them. Keep in mind, add one centimeter on your measurements when you are building the frame.

When you are securing the aluminum profile in the vice, make sure the cut will be made close as possible to the vice, in order to eliminate the vibrations.

After all the pieces are ready, you can start assembling the frame for the solar panel. Put the frame in place to see how the corners are aligning.

8. Placing the polycarbonate sheet and the J-Box

The polycarbonate sheet will have the same dimensions as the glass sheet used for the front of the panel, 126 by 56 cm.

We will mark two points and using a piece of profile we will draw a line. To easily cut the polycarbonate we will use the jigsaw.

Between the cells and the polycarbonate we will place this sponge used on laminate flooring. This will absorb any shocks our panel may have during his life time. This will also have the dimensions of the glass sheet, 126 by 56 cm.



After the sponge is in place, we will make a hole to get the wire through and then we will place the polycarbonate sheet on top. But before that, we need to remove the protection film from both sides.

We will drill a hole to get the exit wire.

The J-box will be mounted on the back of the panel. The J-box will be kept in place by two screws. We will make a mark and drill the holes in polycarbonate.

Now, insert the screws which will secure the J-box in place. If the holes of the j-box are too small and the screws won't fit, use the drill and a drill bit to make them bigger. The screws are now in place and we can tight the nuts and finish the job.

The polycarbonate needs to go under the aluminum frame.

You can start applying the silicone to seal the solar panel and make sure that water won't go inside. It will also keep the aluminum profile in place. After the silicone dries up, you will see that your panel is very rigid and everything is ok.

Flip the panel and apply silicone on the other side as well. Make sure that all the cracks are filled.

The solar panel will be ready to use after the silicone is dried.

9. Connect the charge controller, batteries and inverter

I recommend building or buying a box for your batteries, so they are protected. We will drill a hole into the box that will hold the batteries and we will insert a cable through that.

We will make a node to make sure the wire will not be pulled out through the hole we've made after it's connected to the charge controller.

It's time to connect this wire to the charge controller, before connecting it to the solar panel.

We will connect the wires on the charge controller on the "power input" connections.

Now, we will connect the wires which will exit the charge controller and go on our batteries. We are using a 5 amps cable for this job.

We will peel off some of the insulation and twist the wires to make them fit inside the charge controller.

The wires should be inserted into the charge controller connection ports. We will keep the same color code, blue for positive and brown – negative.

We want to secure the charge controller in place using two self drilling screws.



Now, we can connect the charge controller to the batteries.

Those are the battery terminals that we will use for this project.

And these two are the cables which will go to the second battery.

Make sure that all the connections are well made because if you have a loose connection, the terminal can spark or begin to kindle.

Using these two wires, we will connect the power inverter to the batteries as well.

We will start the inverter to make sure that everything is working right.

The green led is On, so it should generate electricity right now.

We will connect the second battery now.

The batteries will be connected in parallel to keep the voltage down. The charge controller, the inverter and the batteries are now connected together and we can connect the solar panel to close the circuit and start charging the batteries.

Just get both exit wires and make the connection in a J-box, or inside your battery storage box. Make sure the water won't mess around with your connections. Now that everything is connected you can start testing your system. Connect an appliance and see if it's working.

CONGRATULATIONS! You built your first PV panel.

Maybe you thought it was easy or maybe not, but the important thing is you are on your way to energy independence.



Of course this is only the beginning. Don't stop here! Build more solar panels. You will get better every time and benefit more and more from the advantages of the solar power.

Types of solar systems

Grid-Tied Solar System - If you want to offset some of your house's electricity consumption by using solar electricity, but don't want the hassle of charging and taking care of batteries here's the thing for you. But take note, if you plan to go with this setup it is important to understand that once the power goes out from your power company, so does the electricity in your house since you're "on-grid."

To have continuous power or at least some backup, you would need some batteries installed.

The components that you will be using are:

- ✓ PV Panels
- ✓ Array DC Disconnect
- ✓ Charge Controller
- ✓ Deep-cycle Battery
- ✓ System Meter
- ✓ Main DC Disconnect
- ✓ Inverter
- ✓ AC Breaker Panel
- ✓ Killowatt per hour Meter
- ✓ Grid Tie In

Grid-Tied Solar Electricity System

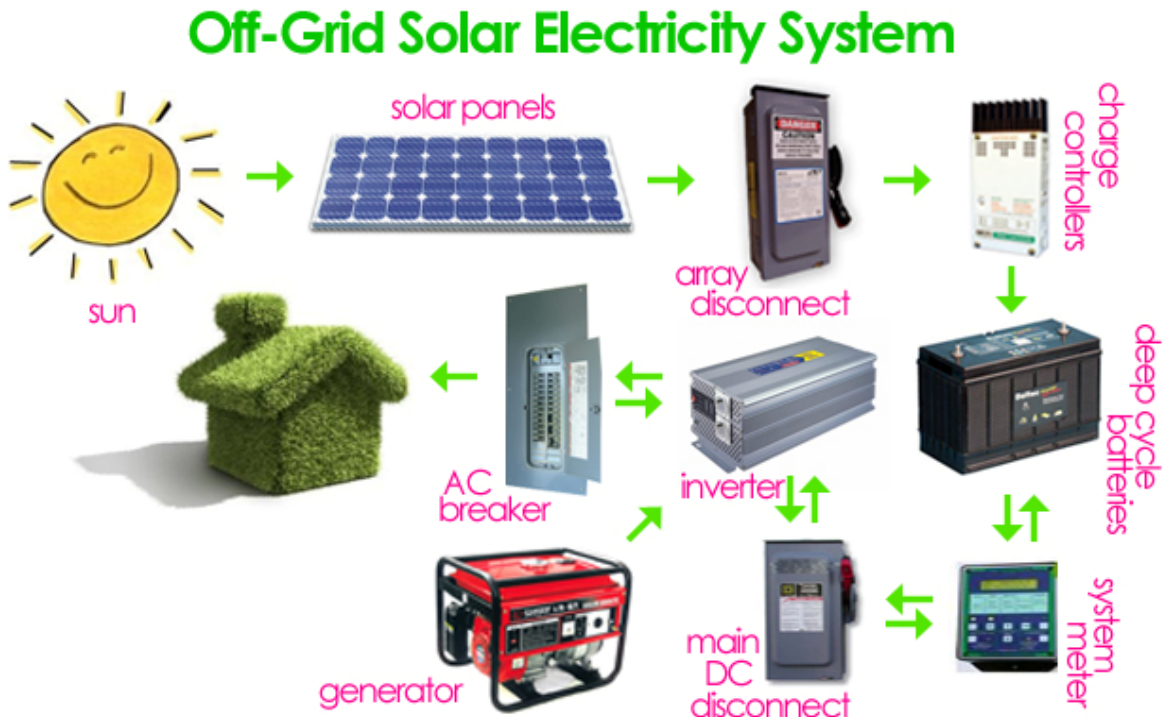


Off Grid Solar System - If you want to completely rely on solar electricity and live off-grid, then this is the system for you. This is especially fitting for people living in very remote areas of the world that is inaccessible with current electricity power lines.

The components that you will be using are:

- ✓ PV Panels
- ✓ Array DC Disconnect
- ✓ Charge Controller
- ✓ Deep Cycle Battery
- ✓ System Meter
- ✓ Main DC Disconnect
- ✓ Inverter
- ✓ Generator

✓ AC Breaker Panel



How to sell electricity back to the grid

When PV first came onto the market, the energy consumed in the production process for PV panels was greater than the energy that the panel could put out in its lifetime. This contradiction was acceptable for NASA applications but not at all economical for residential consumers.

Over time, costs decreased to the point where solar power became a viable financial investment but only under the best circumstances. In order to encourage widespread use, the government stepped in and initiated subsidies and tax breaks. But the biggest benefit of all came when net metering was legislated into law.

Net metering means that you can sell your excess power back to the utility company. If your solar PV system generates more power than you use, the excess is fed back up the power wires to some other customer. Your power meter literally spins backwards!

Why is equitable net metering so great for PV system economics? Every solar system, whether PV, water heating and so on has a certain maximum capacity.

This depends on the size of the system, of course, but it also depends on other factors, such as the orientation and location of the solar collectors and how much sunlight is available. On a cloudy day, system capacity is much less than on a sunny day. On a hot, summer day, the capacity can be very large.

The point is that solar systems don't put out consistent power from minute to minute, day to day, or season to season. So the problem with a standalone system (which isn't connected to the grid like an intertie system) is that you get wildly fluctuating energy outputs, which makes it very difficult to operate your household because you can't assume how much energy you'll have available.

But when you tie into the grid, you can use as much power as you want, whenever you want, and your PV system is merely contributing whenever it can. Picture it like a bank. You put money in during the day, when the sun is shining, and then later on you can make withdrawals.

System utilization is an efficiency standard. How much of your system capacity are you actually using? The greater the utilization,

the better the financial investment, because you're reaping more of a return. If your solar energy system is sitting idle half the time, it's a big waste. For example, a solar water heater is useless when you're on vacation because its capacity is entirely wasted. The same is true for a standalone PV system.

But when you're tied to the grid, your utilization is always 100 percent because every bit of power your system generates is used. When you're on vacation, you're using no power but still generating the same amount, which is all sold back to the utility. The intertie system is actually making your vacation cheaper!

What about wind power?

Wind is another viable, renewable energy resource that can provide electricity to our homes and businesses, while reducing our carbon footprint and the use of fossil fuels. In the case of wind power systems, we are using the force of the wind to generate electricity instead of capturing energy from the sun.

Wind and solar systems complement each other very well and can be combined to increase your alternative energy supply. Before you consider investing in a wind energy system, however, it is important to determine if your location offers sufficient environmental conditions to harvest wind power. Just as you would not put a solar panel in the shade, you wouldn't want your wind turbine in a low turbulence area.

There are a large number of designs that you would go along with, the commonest being vertical or horizontal, however which you utilize is dependent on a few factors. A vertical turbine has blades that stand vertically from the ground, and a horizontal design is the most common design (the turbine configuration that larger wind farms use).

By taking the time to contemplate at least two factors first, you can be certain that your wind turbine produces clean, inexhaustible, vitality for years to come. Let's have a look at two elements that may enable you choose the proper windmill design, and take advantage of out of your do-it-your self wind power project.

Wind Speed

The first consideration is obviously wind speed. Most definitely you've already thought of this before deciding that wind energy was an appropriate resolution for you, however we have to look at it once more earlier than choosing whether to create a vertical wind turbine or a horizontal design. As soon as you realize the common wind pace for your area, deciding on a design is simple.

1. If you happen to live in an area the place wind averages round 8mph then a vertical windmill design is best suited for you. Vertical blades will flip simpler with the wind, and you'll simply add a gear field to increase the precise rotation on the generator if you want to.
2. Should you stay in an space where wind speeds average 12mph, preferably somewhat greater than that, then a horizontal design is likely more suitable. With three blades dealing with horizontal to

the wind it is possible for you to to seize more wind energy and in flip rotate your generator shaft faster (often as quick as 600rpm)

Location

The next vital consideration is location. This aspect is extraordinarily necessary if in the first step you determined that a horizontal blade configuration was best. With blades facing the wind, and normally a rotational circumference of six ft or extra, you need to be able to get the complete turbine up into the wind. If there are bushes or constructing blocking the wind, chances are you'll be higher of going again to a vertical blade design.

A vertical design will take much less wind to turn it, and thus is extra appropriate if there is something preventing you from getting a 6-foot-diameter turbine up into the wind. The downside to vertical blades is that they do not rotate as quick and won't be capable of produce as much energy without making use of a gearbox to increase the rotation on the wind generator.

With two simple concerns you now have the data it's good to choose the best windmill design and ensure your wind turbine offers clear power for years to come.

Build your own wind turbine

There are different types of wind turbines, but the principle, the capturing of the wind's kinetic energy, remains the same. If you don't want to invest in a ready-made turbine, try this basic wind turbine for your home.

1. Acquire a generator with a DC motor with an RPM (revolutions per minute) rate of between 300 and 1000. The generator needs to have a hub on it for mounting the blades.
2. Make the blades from a 3-foot length of PVC pipe. The pipe should be 8 to 12 inches in diameter. Using a reciprocating saw cut the pipe lengthwise into four pieces, all the same width. Mount the blades to the hub.
3. Use a 2-by-4 length of lumber 3 feet in length for the shaft. Mount the generator with the blades to the shaft.
4. Add a tail to the opposite end of the shaft. The tail can be made from a thin piece of wood or sheet metal, and should be one square foot in size. The tail is the rudder that keeps the blades turned into the wind. Use screws or nails to secure the tail to the shaft.
5. Mark the location for the turbine. This should be an area free from obstructions such as trees or tall buildings; hills or other geographic rises are ideal. If no such location is available on your property, build a platform on which to place the tower that will support your wind turbine.
6. Create a tower to support the turbine. Use conduit or other kind of piping that will support the turbine. How much pipe you need depends on high off the ground you need to mount your turbine. Secure the tower in the ground using cement or onto the platform. Before raising the tower, equip it with a swivel base on which you will secure the wind turbine. The base must allow the turbine to make a complete 360-degree turn.

7. Lift the wind turbine onto the tower and install onto the swivel base. Depending on the height of your tower, you may need to use a pulley system to raise the turbine.
8. Hook up the wind turbine to a 120-volt inverter. From the leads on the generator, run the wires to the inverter. The inverter will convert the DC voltage to the standard 120-volt AC current used in households.
9. Plug any household appliance that runs on AC current into the converter. The appliance will now run on energy produced by your wind turbine.

How Much Power and Energy Does a Wind Turbine Generate

Only a fraction of the wind's power can be actually extracted out of the wind; there is no way to harvest all of the wind's power. If all of the wind's energy was transferred to the wind turbine, then the air that hits the blades would have to come to a complete stop (i.e. all the wind's energy was absorbed in the blades).

This is not possible because continuous operation of a wind turbine requires that the air that hit the blades then "get out of the way" to let the air that is behind also hit the blades. If all the energy from the wind was transferred to the blades, the air would stack up in front of the turbine. Then the wind would have to blow around the turbine, rather than through it. In reality, the air that hits the blades keeps some speed allowing the air to move out of the way, thus allowing continuous flow of the air into the turbine.

According to the laws of physics, the theoretical limit of wind energy that can be converted to rotational energy at the turbine's shaft is about 59%. This value is known as the *Betz Limit*. In practice, the collection efficiency of commercially-manufactured wind rotors is typically 25% to 45%. Small wind turbines tend to have efficiencies at the lower end of this range.

Wind Example:

If you have a small wind turbine with a blade diameter of 1 m (about 3 ft) and an operating efficiency of 20% at a wind speed of 6 m/sec (about 13.4 mph). Then, to calculate how much power the turbine can generate at this wind speed:

Rotor swept area: $Area = \Pi \times (Diameter/2)^2 = 3.14 \times (1/2)^2 = 0.785 \text{ m}^2$

Available power in the wind: $P_{wind} = \text{Air Density} \times Area \times v^3/2 = 1.2 \times 0.785 \times 6^3/2 = 101.7 \text{ watt}$

Then the power that can be extracted from the wind assuming 20% turbine efficiency is:

$P_{turbine} = 0.20 \times 101.7 = 20.3 \text{ watts}$

If this ran continuously for a year (about 8,750 hours) then it would produce: $20.3 \text{ watts} \times 8,750 \text{ hours} = 177,625 \text{ watt-hours}$, or about 177 kWh in a year.

(Note: I used the density of air at sea level, which is about 1.2 kg/m³)

How to estimate your current electrical demand

Electrical energy consumption varies widely from one household or business to another. In an all-electric home equipped with numerous electricity-guzzling appliances — like electric stoves, central air conditioners, electric space heating and electric hot water — average monthly electrical consumption typically falls within the 2,000 to 3,000 kilowatt-hour range.

In homes that use natural gas or propane to cook, heat water, and provide space heat — and have no air conditioner — electrical consumption may be as low as 400 to 500 kilowatt-hours per month. On average, though, most homes in the United States consume between 800 and 1,000 kilowatt hours of electricity per month.

To determine the electrical consumption of your home, simply review monthly electric bills, going back two to three years, if possible.

If you don't save electric bills, a telephone call to the utility company will usually yield the information you need. Most utilities will gladly provide data on energy use to their customers. Electrical consumption is listed as kilowatt-hours. Many companies also post the data online. All you need is your customer number.

If you recently purchased an existing home, you can ask the previous owners to share their utility bills. If they have not saved them, they may be willing to contact the utility to request the information.

Remember, however, a house doesn't consume electricity, its occupants do, and we all use energy differently. If you are frugal and the previous owners were not, their past energy usage data may be of little value to you in predicting your usage.

Once you have secured energy bills, calculate the total annual electrical consumption. Do this by adding the monthly totals. If you have data from two or more years, calculate a yearly average. If several years' data are available, it is helpful to determine the range — that is, the lowest year and the highest year. It's important to look for trends, too.

For example, is energy use on the rise, staying constant, or declining from year to year? If you notice a dramatic increase in electrical energy demand in recent years, exclude earlier data, which lowers the annual average. More recent data more closely reflects your electrical consumption.

If, on the other hand, electrical energy consumption has declined, earlier data will inflate electrical demand.

If you are installing a grid-connected system, this is all the data you'll need. You or an installer can size your system based on the annual electrical consumption and the percentage of electricity you would like to generate by your alternative energy system.

If you are installing an off-grid system, you need to calculate monthly averages — that is, how much electricity is used, on average, during each month of the year. To do this, simply add up household electrical consumption for each month, and then divide by the number of years' worth of data you have. If your records go

back three years, add the electrical consumption for all three Januarys, then divide by three. Do the same for February and the remaining months. Record monthly averages on a table.

After you have calculated monthly averages, look for patterns in energy use. Are there months or seasons during which electrical demand is higher or lower than others? If you live in a hot, humid climate, for example, electrical consumption may peak in the summer when the air conditioner is operating full tilt.

If you live in a colder climate in which air conditioning is not required, electrical consumption may peak in the winter because lights are on the longest and the heating system is being used. Understanding seasonal demand is extremely important when sizing an off-grid system because you need to size your system to meet your demand during that period.

A simple device to reduce your electric bill

A thermometer is one of the simplest and most effective home energy saving devices. It can save energy by helping you measure the temperature of refrigerators and freezers and adjust to a more energy efficient (or health-safe) temperature. A thermometer can also help you find poorly insulated areas of your house.

Save on refrigeration: If your refrigerator or freezer temperature is set too high, you can lose food to spoilage, which is a waste of the energy used to grow and transport the food to you. If the temperature is set too low, you're using more electricity to cool your

food than is necessary. You should measure your refrigerator and freezer temperatures at least a couple of times a year - preferably more often if there are little hands in the house who might 'accidentally on purpose' turn the temperature controls.

To measure your refrigerator or freezer temperature, place the remote probe inside a jar 3/4 full of water. Leave the jar inside the refrigerator or freezer - at least one hour for the refrigerator, at least 6 hours for the freezer. Once this period has passed, reset the thermometer's minimum and maximum temperatures.

Then wait a few more hours. Take a reading of the minimum and maximum, and take the halfway point as the likely average temperature of the refrigerator or freezer. If that halfway point is colder than required, turn the temperature control dial up a notch. If it's warmer than required, turn the control down a notch. Then reset the minimum and maximum, wait a few more hours, and try again.

It's best to avoid a lot of opening and closing of the refrigerator/freezer door when doing this, as you will distort the readings somewhat, but the jar 3/4 filled with water is designed to mask out sudden fluctuations caused by the door being opened.

Make sure the jar is no more than 3/4 filled for the freezer test, so that the expanding water doesn't crack the jar!

Save on hot water: Use your thermometer as a home energy saving device to measure the hot water temperature coming out of your tap. Turn the hot water temperature down on your heater if the temperature is above 49C or 120F.

If you install an insulating blanket around your hot water heater, you can use the thermometer to assess how effective the blanket is. A large difference in temperature reading between the space between the heater and the insulating blanket (reading A) and the outside of the insulating blanket (reading B) will tell you that the blanket is really helping you save. A small difference means the blanket isn't accomplishing much.

Find insulation gaps: If you don't mind taping your remote probe to the drywall or plaster of your outside walls and the glass on windows, you can measure the temperature of walls on a cold day when the heat is on, to determine where heat loss occurs most quickly. In a properly heated room, colder sections of wall usually indicate that there is less insulation behind them.

You can take readings on several windows and compare the results; lower readings on a particular window may mean that window lacks the energy efficient reflective coating of other windows in your house, or, if it is a double- or triple-pane window that is supposed to be filled with an insulating gas such as argon, that the insulating gas has leaked out.

Alternative solutions

How to build a cheap portable generator

I showed you that installing a solar PV system or a wind generator is the greenest option, letting you cut your ties to the fossil fuels and nuclear power that produce nearly all grid-based electricity.

An alternative solution would be a power generator and next I'll show you an easy and inexpensive way to build your own personal power generator.

The nice part about this unit is that the generator is built right into the lawn mower deck. You can even strap 2 or 3 batteries on the deck and steer the whole thing wherever you want to go.

Basic Components

The Motor

I will use what is probably the most common lawn mower engine around, the Briggs & Stratton vertical shaft four-stroke gas engine, in the 3 to 3.5 horsepower range. You will have to remove the cutting blade and replace it with a drive pulley. It's important that the motor shaft extend at least 1 ¼" out of the bottom of the motor, as you will want your pulley to clear any obstacles like the motor mounting bolts.

Take a good look at the motor shaft, in most cases you have a 9/16" mounting bolt holding the cutting blade to a hub that's attached to the end of the motor shaft. The hub has a 3/16" key built in it to match the slot on the motor shaft, which is normally 7/8" in diameter.

Make sure the motor shaft is keyed so that your pulley can be fastened securely. This will be the easiest set up you can find. If you run into a motor



with a shaft that has only a threaded end and no key way, then walk away from this type of set up as it's way too much work and aggravation to attach a pulley to this type of shaft.

The Alternator

Automotive alternators are little power producing jewels that will be the heart of our systems. When driven by a lawn mower engine, we can produce a steady supply of quick, cheap and reliable power whenever we want. You can purchase alternators from Auto wreckers rebuilt or as is, sometimes with a warranty.



While shopping around for all the different makes of alternators, Ford, Chrysler etc., I found the GM alternator the most favorable for our systems. There are two types of GM alternators, one with a built in voltage regulator and the other with an external voltage regulator. Use only a GM style alternator with a Built in Voltage Regulator, as they are easier to wire up and work with. I had three main goals in mind when I built my generators: build them cheap, safe and simple.

I built my projects using two different alternators with a 40 and 65 amp output. You may also run into different size casings of GM alternators. I stuck with the most common sized casing which measures slightly over 6 ½ " at the mounting hole openings. Your alternator should come with a two-wire molded connector/harness that plugs into the casing.



You need this connector to hook up your alternator properly later on. Make sure you have it when you purchase or salvage your alternator. If not, you can pick one up at an automotive supply shop.

The Lawn Mower Deck

Here are a few tips for selecting a desirable lawn mower that will keep your time and labor to a minimum: the simpler the design of the lawn mower, the better. You will need to bolt a set of mounting brackets and an alternator to the back of the deck, so choose one that is as flat as possible.



We are also going to cut a slot in the backside of the deck so make sure this part is as flat up and down as possible too. Now take a look underneath. Some mowers have a shroud circling the cutting blade. Try to avoid this on the rear side of the mower deck, as we want to keep our cutting to a minimum. And make sure your deck is made of metal, stay away from the plastic ones.



Motor Pulleys

I have used two different styles of pulley's, aluminum and cast iron. A strange thing happens when you remove the cutting blade and hub off your lawn mower engine..... It will not start! The flywheel on your motor is most likely made of lightweight aluminum and it needs the extra weight and momentum of the cutting blade assembly to rotate it through a complete revolution.

A flywheel's main purpose is to store energy so it can carry the crankshaft through the 3 non-power strokes of a 4-stroke engine. So, the flywheel must shoulder the burden of the rotation for 75 % of the time. If you take away some of its mass on the motor shaft, it will not run smoothly, heck, it won't even start. So if you have a lightweight flywheel you're going to need a pulley with some weight on it.



So, how do you tell if you have a cast iron or a lighter aluminum flywheel? Take your blade and hub assembly off your motor shaft and start pulling the cord. If after 4 hours you haven't started the engine, well.... it's a pretty good bet that your flywheel is aluminum and you will have to use a heavier cast iron pulley. Or you can remove the top motor shroud that reveals the flywheel area, put a magnet near the flywheel fins. If the magnet doesn't stick, it's aluminum, if it does stick then you have a heavy cast iron flywheel and you can get away with using an aluminum pulley.

Our motor shaft was 7/8 " in diameter. It seems that as soon as you look for a pulley with a bore bigger than 3/4 ", they are very difficult to find in the normal "Retail" stores. So I went to a bearing and transmission shop to buy our pulleys. I found aluminum pulleys gave good service but they didn't stand up to the long hours and wear and tear, as did the cast iron pulleys.

So I opted for a cast iron pulley from a company called TB Woods. It uses a system with two parts, an inner bushing and a main pulley. The inner bushing has a split in it. When you tighten these two items

together with the mounting bolts supplied, the split bushing closes onto the shaft with a tremendous grip. The pulley was also keyed, so once it's installed, it stays put. I used ½" wide pulleys on all my projects, with diameters ranging between 3" and 6". We'll discuss the proper pulley diameters later on.

Belts

I stuck with half-inch wide belts to simplify things. I also found out that not all belts are the same. Our alternator is designed to work best with an automotive type belt and our motor pulleys were designed to work best with utility/industrial belts. So, what to do?

An automotive belt has a sharper angle or "pitch" on the side of its surface, so it will ride deeper in the motor pulleys. And if you are using a cheap pulley, it will start wearing a groove in the side of the pulley. The better choice is the industrial belts, but we have differences here too. The half-inch industrial belt is covered by two different styles, the "L" series and the "A" series. The "L" series belt is designed for fractional horsepower applications...light duty. On the other hand the "A" series belt was designed for full horsepower applications, heavy duty. It has more polyester cords built into it for more strength and durability.

I tried all 3 different types of belts and they all worked fine. For short-term use you can get away with using the "L" series fractional horsepower belts or the automotive belts. For heavy work loads and long term use, I found the "A" series industrial belts gave us the best service. I purchased my industrial belts at the same place I got my heavy-duty pulleys, a commercial bearing and transmission shop. The general all-purpose belts can be found in the furnace sections of

your hardware and building supply shops. And of course the automotive belts are available at your local garage or auto supply shop.

Additional components

The Power Inverter

The inverter is an electronic device that converts low voltage DC (direct current) electricity from a power source into a standard 120 volt AC (alternating current) that we use in our homes. The power generated from our alternator is a low voltage DC usually around 14 volts. In order to maximize our power capabilities we are going to add an inverter to the system. Inverters are sized by the amount of wattage they can output.

In the case of an emergency you will no doubt want to power some 120volt AC devices in and around your home. You will need to decide what you think is absolutely necessary to run during a power interruption and then calculate how much wattage (power) each device consumes.

You can do this by finding the manufactures rating plate on the appliance you wish to operate. Take the amperage rating of the device and multiply this by the household voltage. Example: An appliance drawing 5 amps of current multiplied by the household voltage. (5 amps x 120 volts = 600 watts).

Inverters start as small as 50 watts, and an average household would use an inverter anywhere between 2500 to 4000 watts for "normal everyday operation". Just remember, you're planning for an

emergency. If you use good power management you can keep your power consumption to lower levels.

Batteries

When we plan for emergencies, we normally store food, water and extra supplies.....why not power? With your home built systems you have the better of both worlds. You can use the generator to charge a battery or bank of batteries then switch over to directly powering a DC to AC inverter for 120 volt purposes.

Then you can use your batteries to power up a selection of 12 volt lights and gadgets. You did buy some 12 volt back up lights didn't you? Or you can reverse the process and run your power inverter off the batteries, the choice is yours. In an emergency you have a readily available supply of batteries around the house to store power. They can be found in your automobile, your motor boat, your spouse's car, your neighbor's, even your mother in law's car. All can be charged quickly and cheaply with your generator.

How to Modify Your Lawn Mower

You're going to have to modify the deck of the lawn mower somewhat, so you might not want to use the family's mower unless you're in a pinch. And don't use the one you borrowed from your neighbor either. You can pick up good used lawn mowers. Try garage sales, your local penny saver and newspaper classifieds.

Okay, let's get started tearing this baby apart. First remove the handles and cables. The removal is pretty straight forward with just

a screwdriver. You can re-attach the throttle cable later or you can control the engine speed at the throttle control near the carburetor.



You will most likely have a second cable coming off the handle to the flywheel brake, a safety feature introduced onto walk behind mowers in the early 80's. Remove the cable at the handle and the brake lever next to the flywheel, you can leave the brake lever as is just flopping around (it may create some drag on your motor) or you can easily secure it off to the side.

If you're not sure which side the lever should be positioned, just pull the starting cord. If it's difficult to pull, the brake is on, if it's easy, the brake is off, now tie the lever off with a twist tie or wire in this position.

Removing the Blade Assembly

Some of these blade hubs can get seized onto the shaft pretty bad after many years and acres of cutting grass. Spray some kind of rust loosening compound onto the area (WD40, RustBuster) if this doesn't work, you will have to use a pulley puller to remove the hub. You can rent or lend one.



Now, while your underneath and have the WD40 handy, spray the 3 or 4 mounting bolts you will find holding the motor to the deck. Spin the bolts out and remove your motor for the next couple of steps.

Cutting the Slot

The rear end of the lawn mower deck is a very convenient spot to mount our alternator with a couple of simple metal brackets. But you have to cut a slot in the back of the mower in order for the belt to reach from the motor pulley to the alternator.



You need to cut the slot 6" wide by 1" to 1 ½" tall on the rear vertical side of the lawn mower deck. You can cut this slot quite easily by using an Oxy/Acetylene cutting torch or you can use a grinder with a cutting wheel. And if you're in a really energetic mood, you can cut it by using a hacksaw. We need to know exactly where the belt will come through the back off the mower deck, so we know where to cut our slot.

So, let's install our motor pulley briefly so we can line up where our belt is going to come out the back. Place the motor pulley as far up the engine shaft as possible and yet still give it enough room to clear

all obstacles such as mounting bolts. Now, look through the grass discharge chute. Place a straight edge on the bottom of the motor pulley and determine where the path of the drive belt will end up coming out of the back plate. Mark this spot. Now make this spot the exact center of your 6" by 1 ½" slot. Remember your belt is only ½" thick so you will have plenty of clearance in case the spot you marked is not exactly centered.

Make sure to remove your motor once again before you start your cutting. Now cut your slot using the methods described earlier. If you decide to use a hack saw, you might not be able to cut a "slot." Instead you will have to cut an entire 6" wide piece out from top to bottom. No problem, just bolt a strip of metal or angle iron for a crosspiece along the bottom of the mower deck, to give it some strength again.

Mounting the Alternator

In order to mount our alternator we are going to use brackets made from a slotted steel material commonly referred to as angle iron. The dimensions of the angle iron were 1 ½" wide and 1/16" thick. The pre cut slots in this material made it very convenient to make an adjustable bracket for the alternator. The 90 ° angling of the metal gives it a lot of added strength, but it was also very easy to cut by hand using a hacksaw.



On the left hand side is our pivot bracket which we cut to a 7" length. On the right is the adjustable bracket, cut it to a 9" length. The pre-cut slots on this angle iron will allow you to move the bracket front to back so you can have the belt tension adjustment you need. On both brackets we want about 5" contacting the mower deck.



Now drill mounting holes on your mower deck 6 ½ " apart width wise and 2" to 3" inches along the length of the bracket depending on the pattern of the slots on your angled bracket material. Drill your holes 3/8" thick with the first set of holes ½" from the back edge of the mower deck.

I extended the slots in the right hand adjustable bracket by cutting the metal with a hacksaw so we could have a wider range of belt adjustment. Use 5/16" bolts with lock washers, now fasten the ends closest to the motor. Even though I selected a relatively flat mower deck, I still have some uneven contouring to deal with. No problem, I just use spacers on the two mounting bolts closest to the edge. Use whatever you have lying around your house, in our case thick washers and a couple of ½ " nuts worked perfectly.



Now take your alternator and mount it with the pulley facing down. One side of your alternator

has a longer molded mounting hole in its casing. This side will become our pivot side and is mounted with a 3" bolt. The right side of our alternator now becomes the adjustable side. You will need a shorter 1 ½" bolt to fasten it to the bracket. Use lock washers with your nuts and bolts as well.

Attaching the Pulley and Belt

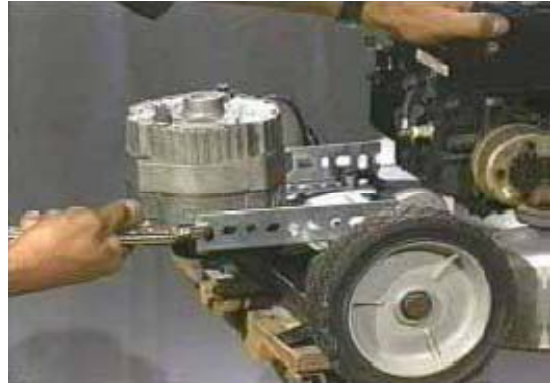
Position your alternator so that the fan blade clears the mower deck between ¼" to ½". If it's too far away from the deck, you will notice more vibration. Now flip the whole unit over and attach your motor pulley, we used a 5 " diameter pulley (more on this later). Next, we need a drive belt, but what length?

Here's a tip for getting the right size belt on your first trip to the store.



Measure the distance between the two outer edges of the alternator and motor pulleys in their final position. Mark this measurement down. Decide ahead of time if you want the lighter duty "L" series or the heavy duty "A" series. Now head down to your local building supply or commercial bearing store to buy a belt.

When you get there take 2 pulleys off the shelf with the same diameter as your alternator and motor pulleys. Next, place a ½" belt around them and stretch the belt out. Do this until you find a length of belt that matches the measurement you marked down from your project at home.



Now, place your belt onto the pulleys, grab the right side adjustable bracket with a pair of Vise-grip pliers, pull toward you until you've reached a desired belt tension and then tighten the mounting bolts. Your next step is a simple wiring of the project.

Hooking Up Your Electrical Connections for the Alternator

As was mentioned before, because of safety and ease of hook up, stick with the GM style alternator with a Built in Voltage Regulator. If you are not sure, ask the people you are buying the alternator from, if they can't answer your question consult an automotive parts professional.



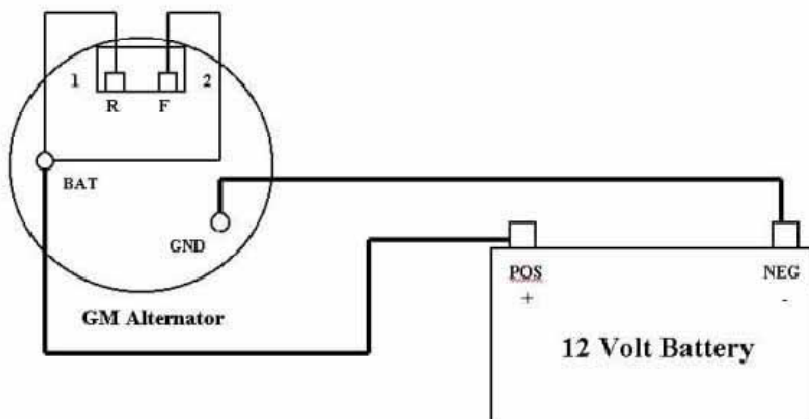
If you make a mistake wiring the alternator you run the risk of damaging your batteries, electronic gear and worst of all causing personal injury. We set out to make this project safe and simple, so we are going to concentrate on the easiest hook up.

The electrical connections for your alternator are a simple but important 4-wire hook up. It was mentioned earlier that the GM alternator should come equipped with a 2 wire molded connector/harness. If not, ask for it at the point of sale or you can purchase one at an auto supply store. Ask for a 2-wire harness plug for the GM style alternator with built in regulator. They only cost a couple of bucks.

Attach your harness into the connector slot on the alternator casing. The molded harness only fits one way and ensures you don't get your wires mixed up, so Make Sure You Use It! You might also want to attach eyelet connectors to the end of the two wires on for your convenience.

Different molded connectors may have different colored wires. We are going to ignore the color of the wires and instead concentrate on the wire identification numbers and letters on the alternator casing. Here are your basic hook ups.

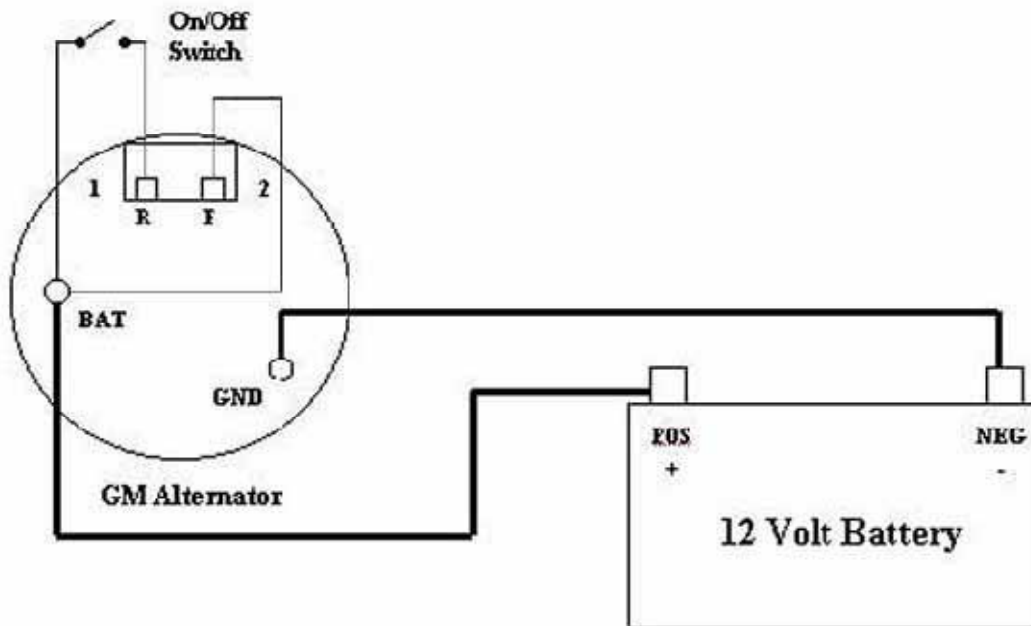
Basic Hook Up



1 or R Terminal is the lead that supplies power to the rotor field of the alternator. Connect this to the "BAT" terminal of the alternator or the POSITIVE terminal of your battery. NOTE: when you are not using your system you have to disconnect this lead as it is now drawing power from your battery and will continue until it's completely discharged.

2 or F Terminal is the voltage sensing line for the alternator. Connect this directly to the "BAT" terminal on the alternator or to the POSITIVE terminal of the battery as well.

On/Off Switch



1 or R For safety and convenience reasons we have installed a simple on/off switch in the # 1 circuit. When we are not using our generator we can simply turn the switch off and it will preserve the

charge in our battery. Another important note is that when this terminal is energized, so is the rotor field inside the alternator.

You will now notice a lot of drag when you try to turn the alternator. Go ahead and try to start the motor, you will pull that cord until your tongue hangs out. You will need to start the motor with the switch "off" then throttle up to your desired speed. You can then turn your switch "on" and introduce the electrical load to the alternator and motor.

This switch also allows us to avoid "sparks" during the unsafe practice of hooking up wires to the battery and alternator while the generator is running. In the presence of vapors coming off the batteries and gas tank, it's a good idea, so please use it!

What is the ideal size pulley to use?

Actually any size pulley between 3" and 8" will work, but there are some differences. An 8" pulley will spin your alternator at a high r.p.m. but will give you very little torque. When it comes time to engage your alternator, it will drag your motor down until it stalls. A 3" pulley on the other hand will give you lots of torque, but a lower r.p.m. at the alternator pulley.

I have discovered that if I try to duplicate what goes on underneath the hood of a car and apply this to my home built generators, I will come up with some favorable results. A quick peek under the hood of a car tells us the motor pulley should be about 5" to 6" in diameter. I found this diameter of pulley gives us an ideal r.p.m for the alternator, with an adequate amount of torque too....But.

Motors With The Same Horsepower Do Not Have The Same Output

I discovered another neat characteristic of the Briggs & Stratton Vertical shaft lawn mower engine. I have a Horizontal shaft Briggs & Stratton motor of the same horsepower. And I consistently get higher revs from the horizontal shaft motor. I couldn't figure this out at first. Both the motors were in good shape well tuned etc, but? So, I searched through the motor technical manuals for the answer.

According to manufacturer specs, they set the throttle on the vertical shaft mower to approximately 80% of its maximum output.

This gives the motor a nice little feature when I start cutting into foot tall wet grass. When the motor bogs down, a device on the engine called a "governor" senses the drastic drop in



RPM's and immediately allows the engine to throttle up to overcome the extra load, so the motor will not stall. When the patch of wet grass passes by, the engine then throttles back to its normally set speed.

So if you come along and decide to attach a belt and an alternator to this motor (like we just did) fire it up, engage your alternator and dump the load on the motor. Guess what? The motor is gonna think it's in wet grass Heaven. So, if you're using a 5" pulley on your project like we did, you may find that the motor will be dragged down to a stall even with a moderate load applied to it. So, how do we solve this? Well there are a couple different ways. One is to reduce the size of your pulley.



I experimented with a 3" pulley and got some good results. The smaller pulley lets the alternator produce its voltage at significantly lower throttle settings, the trade off of course is a lower amount of current (power) coming out of the alternator. Or, there is another option. I discovered a handy little gadget that helps me solve the problem of engine stalling when you engage the alternator. It's a GM style headlight/dimmer switch. I installed this into the #1 (R) circuit of the alternator harness.

The adjustable dimmer in the switch is actually a variable resistor or otherwise known as a rheostat. It works by using resistance to adjust the flow of current to the alternator's rotor field. The more resistance you have, the less current will flow. This in turn creates a weaker or stronger magnetic field in the alternator, which will then give us more or less power off the alternator. Huh?

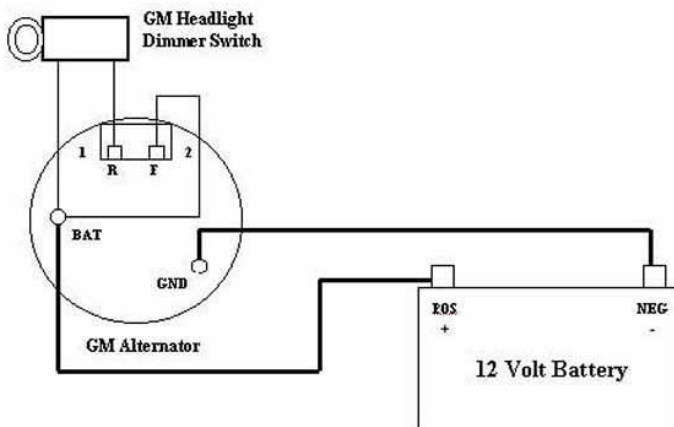
Let me explain it in a more practical sense. Let's say you have a generator like we just built operating at normal running speed

spinning a 40 Amp alternator. You decide to charge a very low battery. Even if you rev up the motor, when you go to attach your lead from the alternator to the battery, the alternator is going to sense a low battery charge and will try to out-put a large amount of current. This creates a huge drag on the alternator which in turn bogs down the motor usually until it stalls.

But, this is what happens when you have the dimmer switch in the #1 circuit. You set the switch at its highest resistance level. Now start turning the knob slowly counter-clockwise. As you keep turning the knob to the left, the resistance level in the switch drops allowing more current into the alternator's rotor field, which in turn allows more alternator output. You will notice at this point the alternator is now starting to "load" the motor.

The beauty of this method is while you slowly turn the switch and load the motor, you can now offset the load with a higher throttle setting on your motor. You can then adjust the switch some more, then increase the motor revs some more until you get a desired speed, without stalling. This system allows a nice gradual smooth adjustment of the alternator's output. It works really slick, try it. And the switches are cheap too.

Variable Resistance Dimmer Switch Hook Up



Which one of these two methods will work better for you? It's hard to say, depending on the type of motor you will use. How old is it? Is it tuned up? What kind of parts you installed on your project? No two set ups are the same, but at least you have some options. Try what works best for you and stick with it.



You can now re-attach your handles. A really handy option is to hook up your throttle cable again and then mount your GM dimmer switch next to your throttle control on the handle. You now have complete control of your generator right at your finger tips.

So, there you have it. You are now armed with the information to be electrically independent should the need ever arise. Stay healthy and stay powered.

Now that you are armed with all the information you need to cover the three big necessities for your family: food, water and energy, there's one more thing you have to consider: your self defense.

Protect you family

Maybe you think of self-defense in this manner: A bad guy comes after me with a weapon and by using a few martial arts techniques I can fight him off and get away. If he really gets nasty I'll spray him in the face with my pepper spray.

Self-defense is not simply carrying a can of pepper spray to ward off an attacker. Self-defense is not the process of spending thousands of dollars on training in the martial arts and spending years in training to become a black belt. Nor is self-defense being able to scream loudly when grabbed by an attacker or to set off a portable security alarm when an attack occurs.

Self-defense is a state of mind and a state of living. Self-defense is a lifestyle that centers on self-protection and self-preservation in the midst of adverse circumstances. This lifestyle is shown by the way you talk, dress, and carry yourself.

Self-defense does not mean living your life in fear or being paranoid. Self-defense means living in a state of awareness of your

surroundings so that when something adverse happens or is about to happen you can take measures, which are appropriate to counter the event.

Living in this state of awareness means that you have several options available to you at any given moment. These options may include, but are not limited to, knowledge of possible escape routes, the use of security systems, the use of a variety of non-lethal or lethal weapons, and knowledge of takedown moves and pain compliance holds.

When an emergency situation occurs, where your health and welfare or the health and welfare of your loved ones is at stake, there are no rules! You just do whatever it takes to get away, stop the attack, and/or disable the attacker. If that means kicking, biting, scraping the face with your fingernails, grabbing the groin and pulling as hard as you can, crushing the windpipe, breaking the kneecap, or snapping an elbow, you do it.

Your ultimate goal can be summed up in one word: **SURVIVAL!**

Ways to Reduce Risk

Consider installing a home security system. A home alarm can be an effective deterrent to criminal intruders. A variety of systems are available, ranging from inexpensive, battery-operated door models to monitored, motion detecting systems costing several thousand dollars.

Install a wide-angle door viewer. These are inexpensive aids for identifying people at your doorstep. If children are allowed to open the door under certain circumstances, install a second viewer at your child's height.

Consider keeping a separate line or cellular phone as a security device. Taking one phone off the hook renders other units on that line inoperable. Using a separate line or cellular phone in your bedroom is a good precaution.

Weapons for self defense

Personally, I used to believe that gun ownership by law-abiding citizens was unnecessary. I bought into the arguments of the gun control groups who advocated doing away with high capacity magazines, automatic weapons, handguns, etc. However, the more I thought through the issue, several key items came to mind that has since changed my opinion.

First, the police (of which I am one) usually arrive after a crime is committed, not before or during the commission of a crime. Even if you have a top of the line home security system for example, the thief is already in your house before the police are notified.

Depending on where you live and who has jurisdiction for patrolling your area, it could take several minutes for a police officer to arrive on the scene.

I do believe that law abiding citizens who value life should be able to own and carry firearms, including handguns, and should be able to

carry them concealed, anytime and any place. However, law-abiding citizens, in my opinion, should be responsible about gun ownership.

This means taking a gun safety course and becoming intimately familiar with the weapon(s) of choice. It means practicing at the range on a regular (weekly, minimum monthly) basis so that one becomes proficient with the gun. It means keeping guns out of the reach of children. It means teaching gun safety to children. It means not mixing alcohol, drugs, and guns. And, it means that if you can't control yourself, you certainly can't control a gun.

As was said earlier, the issue of owning a firearm is a personal one. I respect your right to choose either way. Now, having said all of that, let's talk about other weapons that you can use to protect yourself.

Your body as a weapon

There are many, many points on your body that can be used as a weapon with which to hurt your opponent. The major points include the head, teeth, shoulders, elbows, wrists, hands, knuckles, fingers, fingernails, hips, knees, toes, heels and balls of the feet. You also need to use your mind and voice as weapons. A loud yell as you execute a strike of some sort, not only helps to scare or distract your opponent, it also allows you to release more energy when you deliver the blow. Remember that if you can reach your opponent with any part of your body, you can potentially hurt him or her.

Regarding striking someone, remember this: use the heel portion of the palm of your hand as the striking tool. If you try to make a fist and punch someone you will most likely damage your fingers,

maybe even break them. You will generate a more effective strike if you hit with the heel of your palm.

Pepper Sprays

Personal defense sprays such as those containing ingredients made from Cayenne peppers are great defense weapons if you used properly and if they are of the right strength. Many police departments rate these weapons just below hard hands (fists) when it comes to force level. These sprays are not deadly and do not produce lasting side effects, yet are extremely effective under most circumstances. There are however, some very important points to consider should you choose to carry a spray.

Sprays work on both humans and animals. Get the spray into the eyes, nose and mouth. Spraying someone in the stomach area won't do a thing.

The effective range of most sprays is from 6-10 feet. Don't spray at less than 2 feet unless you are willing to get the effects of the spray yourself. Once you spray someone, back up! Get yourself away so that you are not contaminated.

While sprays are almost always instantaneously effective (within 2-3 seconds), on some people high on drugs or alcohol, it can take up to a minute or slightly longer to take effect. So, whenever you spray, always move back or to the side and attempt to get away. There are a few people who are not affected by OC spray.

If the wind is blowing at you, you are probably going to get a blast of the spray so try to move so that you are spraying with the wind and

not against it. If this is a concern for you, you may want to consider getting pepper foam instead of pepper spray. The foam is almost as effective, is better for use in enclosed areas, and is not as easily affected by the wind direction.

What if you get sprayed? If you get a full blast, you won't be able to do much because you won't be able to see. However, remain calm and breathe slowly. Don't rub your eyes or skin. Force yourself to keep your hands away from your face. If someone comes to your aid, have him or her get you to water.

Flush with lots of cold water for about 20-30 minutes. Try to force your eyes open as you flush water in them. Stay in the fresh air and face the wind so that the wind helps cool your face or affected area. If possible, sit in front of a fan or air conditioner. It will take about 3 hours for the full effects of the burning sensation to wear off. If the decontaminate spray or wipe is available, try to get the ingredients into your eyes as soon as possible in order to help get the eyes open more quickly.

As with all methods of defense, sprays are not 100% effective. Just as you can carry a gun but miss your target when you shoot, sprays have their shortcomings as well. Be aware of them.

Common household weapons

In the kitchen: The kitchen is the place you'll find many solid, blunt objects, used for cleaning or cooking. These products are made to last for years, so there's no doubt that these objects can cause some serious damage (or at least seriously scare) to an aggressor.

Brooms. A good old fashioned weapon you should keep around the house. Even if most households rely on vacuum cleaners, a broom is always useful for cleaning without plugging in the vacuum cleaner or for when you run out of electrical power. Also, you can defend yourself against burglars, especially if they're waving a knife at you. The long and rigid broom pole can keep the attacker at bay and you can use it also to disarm the attacker if you have the opportunity. The most important advantage it gives you is that you can keep a distance between you and your attacker.

Ceramics: These objects are very tough and can be used as effective, ranged weapons against the attacker. Throwing these at him or her will make the attacker duck for protection, time in which you can run away or ask for help. Also, if your aim is good, and hit the attacker's head, you will immobilize the criminal and have time to call the police.

Scissors and letter openers: Pretty straightforward, you can stab or cut the attacker with one of these. Also, considering that these objects are sharp and can cause serious damage, they're able to scare the attacker off. A slight disadvantage is the fact that you have to go pretty near to efficiently use them, as scissors are small. But the effect it can have on the attacker, by stabbing him, is surely superior to the one of the broom. The same can happen with knives- grab the first big knife you find around and point it directly at the criminal.

The kettle. Ah, yes, the kettle. You can use it in two ways. First, if you're boiling water right then, throw it at the attacker immediately. The hot water will make him fall down at once and he will be unable

to attack you. Use the time to go out of the house and look for help. If you're not boiling water right then, throw it at the guy and maybe you'll hit him right in the head and you'll have time to run.

A pressure cooker can be the extra large version of the kettle. If you're cooking right then, grab the handles and throw the contents straight at the man. Don't think about the fact that you'll get burnt a little in the process- just grab it and throw it. The risks and damages caused by a small burn are definitely lower than the ones that the attacker might inflict on you.

Spices. Many spices that give your foods a chilli flavor can cause eye burns to an attacker. Of course, you have to throw them in your attacker's face. You will gain enough time to go to the door and ask for help or hit him while he's down.

In the bathroom. If the attacker finds you in the bathroom, don't despair, as you can use objects around to defend yourself.

Toilet cleaners. These substances are very corrosive and when get in contact with the skin, they can cause some serious problems. Don't hesitate to throw these substances straight in the attacker's face- he will not be merciful to you as well.

Deo sprays: most sprays contain alcohol or some irritant substances that will hurt the criminal's eyes, long enough for you to make a run for it and ask for help.

A blow dryer: This is a compact, blunt object that, if hits the attacker's head, can take him out of operation for 30 minutes even,

long enough to call for the police or to leave of the house. The same is valid for a shaving machine, which you can also use to hurt the attacker's eyes, if you can get close enough.

In the bedroom: Even if you're in bed, reading or watching TV, you have to move fast if someone breaks in.

Your alarm clock. Alarm clocks are blunt and big objects you can throw directly at the attacker. Also, other objects on your night table can be used as weapons, as long as they're big and dense enough to cause some damage.

Lamps: Lamps are usually big, heavy, pointy objects you can use as a spear. Don't hesitate to unplug it directly from the wall and throw it at the attacker, ideally with the sharper edge towards the burglar.

These are only some of the objects around the house you can use to defend yourself. But the most important thing you have to keep in mind is that you have to be brave. Never panic and don't hesitate when having to attack the person or animal breaking into your house.

Sure, instincts might kick in at that point, but at the same time you have to keep a clear mind and make sure you make the most out of the household items around you. Make sure you have this list available for all the members of your family and instruct them all on these great techniques that I have gathered for you.

How to build a panic room

A panic room is a room in your house where you or your children can go in the event that an intruder has entered the house or in case of a disaster. It should protect you for an extended period of time and you should be able to communicate with the outside world once inside. A panic room can be a bedroom, a large closet, or even a bathroom.

To build a panic room, be sure that it is virtually impenetrable from the outside. The door should be solid core, preferably with a metal exterior. If the door opens outward, pin the hinges. If the door opens inward, you will need to reinforce it against being kicked in by drilling the strike plates of your locks well into the frame. Cane bolt locks are an excellent addition to safe room doors.

The door should have no less than two solid core deadbolts mounted a few feet apart. They should be keyed from the outside, but not from the inside—the whole idea of a safe room is that you can lock it quickly.

It's a good idea to have a 180° peep hole so that you can observe outside action if necessary and verify the identity of those outside the room.

Make sure that the walls of your panic room are not accessible to anyone else. Most walls within houses consist only of a wooden frame with sheets of drywall on either side. One swift kick is all it takes to break through most drywall. For this reason, it's best to

place your panic room at the end of hallways, in closets, or in other situations where large areas of wall are not easily accessible.

The ideal panic room is on an upper level, with a window. Your own bedroom is an ideal panic room, since you can lock the door at the first hint of trouble, or you can sleep with your door locked.

Inside your panic room you should have a cell phone to call 911. Don't rely on the house phone—it can be disconnected or taken off the hook, thereby preventing you from making a call. If you have a window in your panic room, keep a rope-ladder so that you can make a quick escape.

The Bug Out Bag – The 15 items you can't go without

To be honest, the most complex challenge is having an idea of what TO and NOT TO carry in a Bug Out Bag. This is the secret of a Bug Out Bag that I'm going to give you: What to include?

1. Water

Because water is so important to human survival, it should never be withheld. In a survival situation water quickly becomes the most precious commodity.

1 Liter per day per person is really the bare minimum. So your 3 day Bug Out Bag should have at least 3 liters of water.

To expand your capability or survive longer than a couple of days you will need a water purification system. This can be as simple as boiling water and iodine tablets, or a serious water filter. Also, consider these tips:

- You can use a Collapsible Water Bottle for extra storage.
- Make water collection easier with a Backpacking Bucket.
- Use Coffee Filters to extend the life of your water filtration system.

2. Canned foods

Ready-to-eat canned meats, fruits, and vegetables are highly recommended, since they give you all the calories you need when a disaster strikes. Try choosing lightweight cans and it is very important that you like them, because that will give you a positive attitude, which is very useful in such an emergency situation. Don't forget a fork and spoon.

3. Energy bars

The energy bars provide lots of calories in a compact form as well as a decent supply of vitamins, so consider adding them when you assemble your Bag Out Bag.

4. Clothing

I'm going to give you a small list of clothing for 3 days and these are items that may save your life. Assuming that you will wear some sturdy boots to properly protect your feet in any situation, you will also need:

- A pair of long pants (not blue jeans)
- 2 Pairs of socks (not cotton)
- 2 Shirts (1 long sleeve and 1 short sleeve for layering)
- A Jacket that is both warm and protection from rain
- A hat
- A Bandana (30 Uses for a Bandana)

5. Shelter items

Something that is often overlooked in many a survivor's kit is the ability to protect from the elements. Don't underestimate the importance of this aspect, because many people would have been alive today if they had considered the shelter necessity.

A simple poncho can be an improvised tent and provide a sufficient amount of protection from the rain. An emergency blanket can be the difference between life and death and is easily packed. In outdoor outfitting websites and stores, they can be found for relatively cheap.

6. First Aid Kit

I will recommend that you build your own First Aid Kit instead of buying one of those prepackaged first aid kits that claim to have 500 things to get you through any emergency. While some are ok, in my experience these types of kits are usually filled with a lot of stuff you are unlikely to need and not enough of the things you will probably need a lot of.

The real list would look like this:

- Gauze
- Gloves
- Butterfly bandages
- Antiseptic wipes
- Scissors
- Needle and thread



7. Knife

I consider the knife to be the most important survival tool. Make sure you purchase a good quality folding knife or maybe two, because you will use it more than you can imagine. I think there is no need to go into details about what this great tool can be used for.

8. Fire starters

You have to inform yourself on at least 3 ways of making a fire. Matches and lighters are the most commonly used, but a fire steel would sometimes prove to be better. These 'strike-style' firestarters are far superior to fuel based ones because they last forever and produce a hotter heat output compared to a Bic. Develop this skill properly, because fire can keep you warm, help you cook food or produce smoke signals.

9. Light

You will be out there for 3 days. That means at night as well, so light is crucial. Get at least 2 flashlights and a set of spare batteries.

10. Duct Tape

It may sound like a ridiculous item to carry in your Bug Out Bag, but believe me, it has saved a few lives. It can be used for emergency repairs on tents, sleeping bags, clothing, rain gear, sealing and waterproofing.

11. A Pathfinder Watch

Orientation is highly recommended in a disaster situation. And nothing is better than a great Pathfinder watch, that can show you the time, direction, temperature, altitude, air pressure to keep your eyes open about your location and weather status. Of course, a

compass is good too, but I think you know exactly why I'd prefer the pathfinder watch.

12. Phone

If this way of communication is available to you, don't hesitate to include it in your Bug Out Bag. Also pack a list of important numbers: friends, family, neighbors, work, school, doctor, insurance, etc written on a piece of paper, in case you won't be able to use your own cell phone at some point.

13. Cash

At least \$500 in cash, including plenty of small bills for incidentals and change for phone calls is required. When the power is out, many stores can't use their cash registers and insist on either exact change or to the closest dollar. Some gold would also be very useful.

14. Radio

Whatever happens, a small radio may be your last communication item and the only way to stay connected to what is going on in the danger area. It might also help you find out when it is safe for you to come back home or if you need to go as far as possible from that area.

15. Weapon

I had to include this, because the truth is it can definitely save your life. Being prepared to defend yourself is part of the survivalist mindset. I will not go into specifics about what type of gun you

should bring, because that is really a personal choice. Take what is comfortable to you.

Avoid a government roundup

It could be from a disaster, an attack, or even because they've decided to end the pretense and show you what they really think of you and your "rights". You'll just wind up in a detention camp where your freedom of movement and resources will be strictly controlled.

That means having a place to go away from your area, a means to get there, and supplies. It's a very difficult thing to do in an emergency situation, with shortages and rationing at gunpoint. But it may be your only chance.

Remember the victims of Hurricane Katrina? Remember how they were set up to be stranded in New Orleans by the government? How they were constantly baited with false hope of rescue for a week after the catastrophe? How they eventually were herded by FEMA into concentration camps?

Get a safe house of your own, an abandoned home, an empty storefront or even a patch of woods. When the troops start going street to street, house to house have escape routes by lesser used streets, trails, whatever.

You may have to go on foot, so have a light backpack with a few days worth of nonperishable food, portable water purifier, a first aid kit, a light sleeping bag-and your weapon. A mountain bike may be a more optimal and versatile escape mode than your road-dependent car.

Better to be on the run, desperate-and have your freedom-than be imprisoned in a FEMA slave camp.

Consider having a small survival kit that might prove to be a life savior. Ideally this equipment should be contained in a canvas or leather pouch. The personal survival kit must be light enough and small enough to fit into the pocket of a jacket or on a belt.

It should contain a small folding knife, a small compass, a signaling mirror, a whistle for signaling, fishing line, hooks, three or four lures, snare wire, a waterproof container of strike-anywhere matches, a flint and steel for starting fires, a container of waterproof and wind-resistant matches, two cubes of chemical fire starter in case no dry tinder can be found, needles and strong thread, and a couple of sticks of freeze-dried meat or salami.

Final thoughts

I think people generally agree that something's going to happen, yet we don't yet know the nature of the beast. It has many faces. Earthquake, fire, flood, plague, meteor strike, nuclear attack, hurricane, and tornado—all strike in the moment. Economic collapse, crop failure, famine, and nuclear winter are forces of siege that could last months, years, or decades.

From a distance, the first evidence may be a blackout or a news report. The area affected by the disaster will dictate the probability, frequency, and durations of blackouts. If the scope of the disaster is large, other services like water, natural gas, gasoline, fuels, food, and

goods will fail. Following that will be the loss of phones, police, fire rescue, utility, Red Cross, and government services.

I believe that a crisis has two components: danger and opportunity. There is danger in a crisis—catastrophe, collapse, and chaos and then there is opportunity in a crisis—restoration, renewal, and revival.

My purpose is to get you through the danger and allow you to benefit from the opportunity. That's why I wrote this book, so that you and millions of other concerned citizens to be fully covered when the crisis hits.

In the end, I would like to thank you for taking the time to read my guide and support my survival mission.

Be safe and be happy!