

How to Generate Free Heat

<http://gravitygarden.com/PowerGarden>



“Does Heat come free? Yes it can!”

The basic principles of heat being generated from sunlight are not complex and making a solar air heat system can help you warm a room in a greenhouse a henhouse or even your own home.

Smaller versions like window based units can assist in supplementing your home heating needs without pollution or high costs. All you need is some sunshine and the right design to create free hot air to pipe into your living space.

This e-book will go over several concepts and designs that may assist you in creating one or more for your own home.

Read my online articles [here](#) for more...

[Montgomery Emerson](#)

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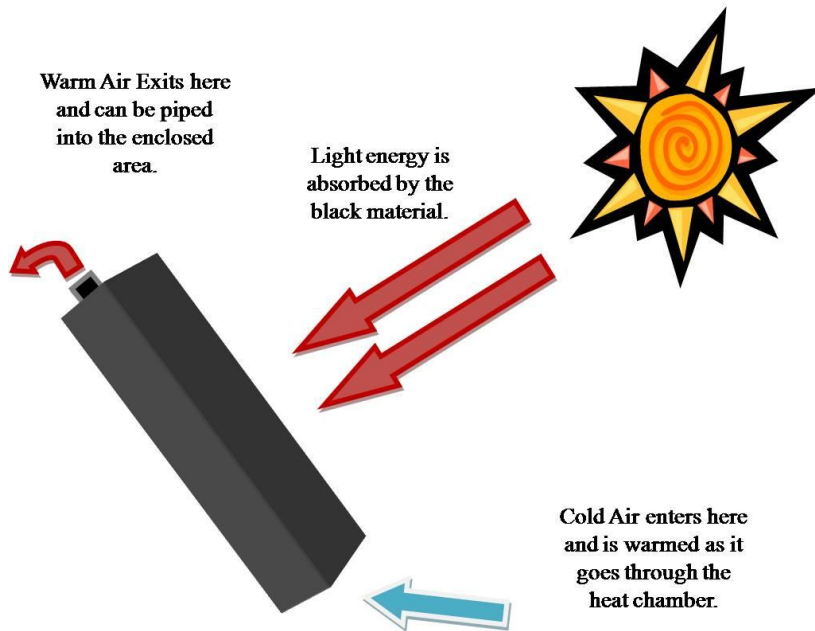
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Does heat come free? Yes it can!

When asked to turn up the heat, most people will walk over to the thermostat and “crank it up”. The typical home spends hundreds of dollars a month to keep warm when the weather turns cold.

With oil rising and the political unrest in the Middle East, it is time we as global citizens look at weaning ourselves off of fossil fuels and look at alternative methods to control our environments and energy needs.

Generating free heat through the principles of passive solar heat is one step toward your own energy independence. The concepts are simple and the cost of making a basic solar furnace is minimal and



can even be free if you use recycled materials.

Building a [passive solar air heater](#) is easy to do and once you get the basic ideas on a small scale you can build a bigger

system to help heat your entire home.

Keep in mind that these basic designs are only meant to supplement your main heating needs as they only work on sunny

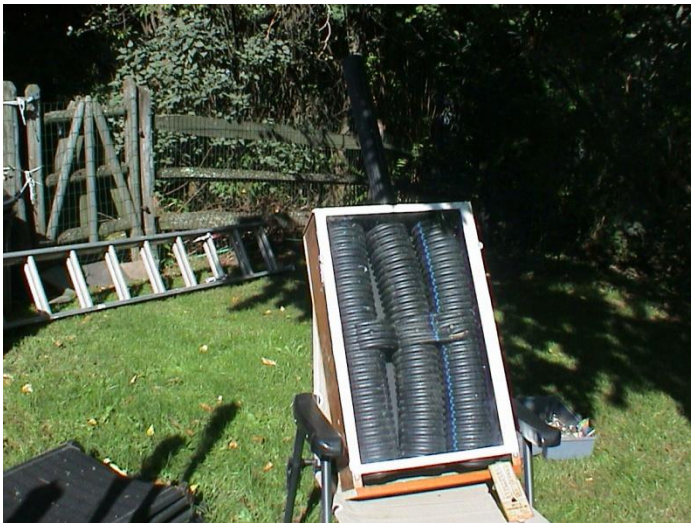
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days, but generating free heat when you can is well worth the effort especially when your neighbors heating costs are going through the roof.

A passive solar air heater comes from the natural ability for sunlight to be absorbed and converted into natural free heat. All you need is some sunlight and the right design to create free hot air to pipe into your living space.

I made my first unit from recycled materials I found in my shed and garage. Once I gathered the necessary materials, I was able to create a simple version within an hour.

The picture below shows my first attempt at a passive solar heater.



As you can see, it was not meant to be fancy but is sure did do the job based on initial testing.

This basic design cost me about 3 bucks out of pocket after it was all said and done.

In my design, I chose to not use aluminum cans for my heating chamber. Instead I used standard black sewer pipe to store and generate heat for my greenhouse solar furnace.

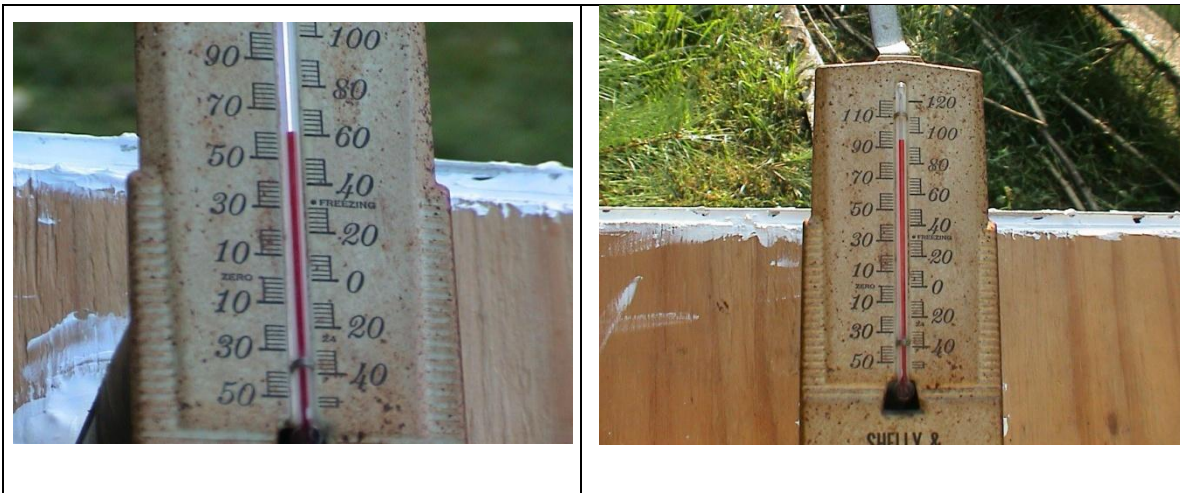
This allowed me to accomplish two goals, reduce the time to create the device and still have a relatively lightweight design, and secondly, to make the unit more portable and usable in different

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situations. The non-perforated pipe is a standard item in many home improvement stores, is relatively cheap and easy to manage so it was a natural choice.

I was able to duplicate the building process using scrap wood, a window pane from an old storm window and, some high heat black paint and tub caulking. It took about an hour to cut the pieces and assemble the solar furnace. I spent about 3 dollars for the pipe, some black paint and standard caulking.

Below you can see two highly scientific readings on my expensive thermometer. The left one shows the current air temperature, while the right one shows the air temperature exiting my solar heater a few minutes in the sun.



I created a [6 minute video](#) showing the process and tested it in my back yard. So, after it was all said and done, I can prove that *heat does* come free, or for as little as 3 bucks if you do not have all the basic materials sitting around.

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How does warm Air on the Ceiling relate to a solar air furnace?

The basic principle of air is that the molecules of warmer air weigh less than cold air. As air molecules heat up, their density changes and therefore lifts the warm air upward and propels colder air downward to replace it. In basic terms, hot air is lighter than cold air and will rise upward.

When cold air enters the bottom, it ascends and passes through the heat chamber. The light from the sun is absorbed by the black material and begins to warm the air as it passes through.

The warm air then collects in the ceiling area of the unit and can then be piped into a room or enclosed area. The amount of heat is directly dependent upon the surface area of the heat chamber and amount of sunlight it absorbs.

In summary, the process that allows warm *air* to travel to the *ceiling* of your living room, kitchen utilizes the same principles of a solar air heater which you can harness to generate passive heat in the winter.

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How to Build Air Heat system for 3 Bucks for free heat

Taking advantage of a simple process where sunlight is transferred



into heat, you can make a solar furnace with a combination of recycled and low cost materials.

This was my first design that incorporated basic items I found in my shed and the local home improvement

store and ended costing me about 3 bucks.

The basic materials I used were:

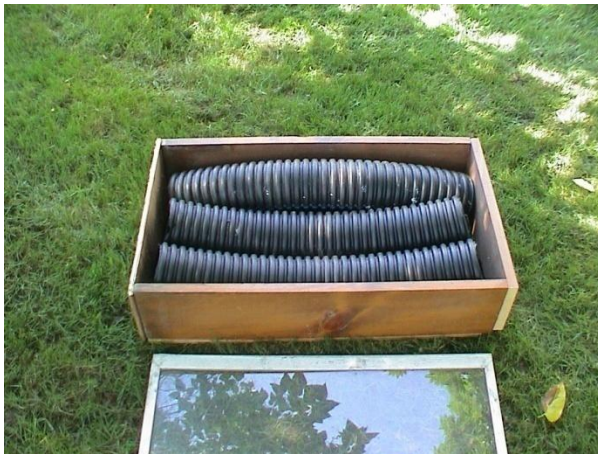
1. Scrap wood
2. 6 feet of sewer pipe
3. Black Spray paint
4. Window pane from an old storm window
5. Tub caulking
6. Wood screws
7. Mirror clips

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I used black sewer pipe to create my [heat chamber](#), and the pane of an old storm window for my transparent light cover and scrap wood I had lying around. The basic steps for building my solar furnace were:

1. Measure and cutting the wood pieces
2. Screwing all sides together spray paint the inside with high heat paint
3. Caulk the seams
4. Attached the Sewer pipe
5. Cover the box with the window pane and secure
6. Cut a 2 inch hole in the top and insert an old vacuum pipe about 4 inches and caulk edges

If you look for solar heaters on the internet, specifically youtube, you will see several designs that basically work the same way using aluminum soda or beer cans to absorb the sun's light to transfer into hot air.



Instead of aluminum cans, my design incorporated standard non perforated [sewer pipe for my heater](#).

I wanted something light and already black and hollow to allow free airflow through my solar air heat system. Although I had to paint the inside of the box, I did not have to worry about drilling, priming and painting the aluminum cans that other designs called for.

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Each unit I came across used the same principal; build an enclosed box with a glass front, fill it with aluminum cans, paint it black. Once the cold air enters the bottom of the box, it travels upward through the airspace toward the top. On the way, the sunlight coming through the glass begins to raise the air temperature. As the air heats up, it gets lighter and rises upward toward an exit hole to be piped in through the window.

It was a simple process and because I used recycled materials, it was relatively cheap. I made the whole thing for about 3 bucks and because it is portable, I can use it for my window heating system or as a way to heat my bucket garden green house.

In summary, the use of sewer [*pipe for my heater*](#) seemed to work out well. When I tested it, I could see about a 30 degree rise in temperature from the exit pipe after about 5 minutes in the sun.

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Making a Window Air Heater

I had done some research and found several designs from other



individuals that had built their window units with everything from soda cans to aluminum sheet metal. Each one uses the same [principal](#); create an enclosed box with a glass front, fill it with inexpensive material, paint it black and you

have a window air heater that generates warm air from the sun.

Colder air enters the bottom of the unit, travels through the black space toward the top. On the way, the light entering the box begins to increase the air temperature. As the air heats up, it gets lighter and travels upward which can exits the unit and can be piped in through the window.

A simple process which can literally use recycled materials and cost no more than the time and basic carpentry skills to put together. My design incorporated the same concepts listed above, except that I was not into drilling holes into cans and mounting them inside a box. I used a simple baffle design to create my heat chamber. It was very easy to do and did the trick.

I used an old storm window pane, some old scraps of wood, some caulking and was done in less than an hour.

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With Solar heaters are popping up everywhere on the internet, there are several designs using aluminum soda or beer cans as the mechanism to absorb the sun's light and transfer it into hot air.

In this one I decided on just basic wood baffles. You can see here I tilted the baffles at an angle to manage the warm air. I could have gone straight across,

but it added a little flair to the design.



Because the color black absorbs light instead of reflecting it, you will need to incorporate this into your designs. If you have ever stood in the sun on a cold day and happen to be

wearing black, you'll notice the sun will actually make you feel warmer faster.

This is the process that you can take advantage of and apply it to generate heat for your home or other enclosed space.

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This version allowed me to accomplish two things, reduce the time



to create the unit and still have a relatively lightweight design. This makes the unit much more portable and usable in different situations.

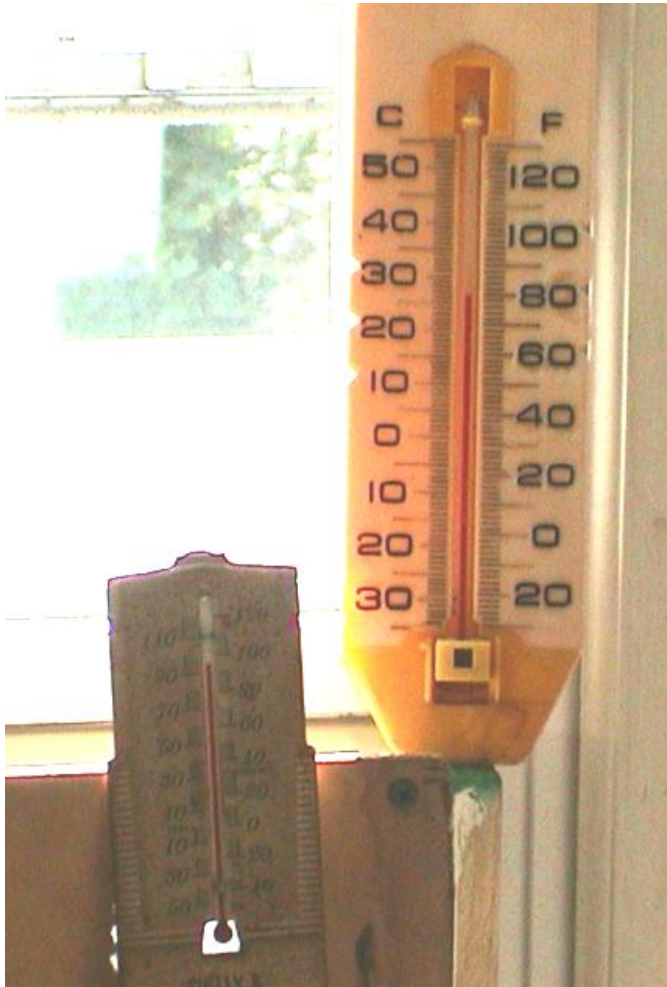
Other than that, I was able to duplicate the building process using scrap wood, a window pane from an old storm window and, black paint and some caulking. It took about an hour to cut the pieces and assemble the solar furnace.

I made this as a prototype, so the look was not as important as if



would generate heat once the light began to hit it. Indeed it was cranking out some nice warm air within a few minutes.

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Although this picture is not very good, you can see the difference of the normal room temperature and the temp coming from the unit. Not a drastic difference because it was fairly warm to begin with.

I will retest when it gets a bit cooler.

In summary, getting *free heat* from a solar furnace is an easy way to save some money and the environment. Making it from scrap materials

made the experience that much sweeter.

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Are Soda Or Beer Cans Really the Best Way to Heat Your Room?



Window air heaters are a great way to generate free heat. I have done my research and found several designs from others who had built their window units with everything from soda cans to aluminum sheet metal to straight wood boxes.

Everyone one uses the same principal; build an enclosed box with a glass or plexi-glass front, add an inexpensive material, paint it black and you have a window air heater that generates warm air from sunlight.

As cold air feeds the bottom of the unit, it warms and travels up through the black space toward the top. On the way, the light entering the box begins to increase the air temperature. As the air heats up, it gets lighter and travels upward which can exits the unit and can be piped in through the window.

Many have used soda or beer cans to build their heat chamber. After reviewing the steps and thinking it through, I have come across other ideas that can generate the same heat without the additional work this design creates.

First you have to drill a hole into each can so the air can pass through and up into the top of the unit. This seems like a great deal of work when there are other inexpensive materials you can use. I used plastic French drain pipe for my heater and it works great. It runs about .45 per foot and is relatively easy to work with. It already was hollow and allowed the warm air to travel freely.

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With the soda can design you have to still paint each can black to get the maximum absorption of sunlight. My French drain pipe already was made of black plastic, so this step was not needed.

In summary, creating a window air heat system that generates warm air from sunlight is easy and inexpensive to do. The soda can design works ok, but I believe there are alternative designs and materials that can save you time and effort and generate as much heat as you need.

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My New design – Free standing Heat Generator



In the quest for [renewable energy](#), I have focused on passive air heat. It is relatively simple to generate but is typically a supplemental source of heat.

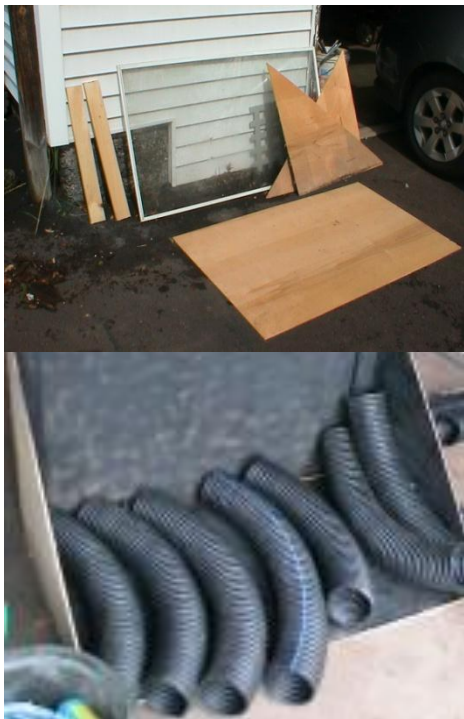
In previous designs, the box was dependent upon leaning against a wall to get the right angle towards the sun.

This design allows the sunlight to naturally enter the unit without having to create a stand or maneuver upward.

Dimensions for the plywood took a bit of visually thinking through the design and measuring the angles. It was a little bit more to work out than the standard box design, but not too bad. I had to create the side pieces so they would match the window dimensions.

I continued use of the French drain pipe because allowed me to curve them to meet the box dimensions and provide a nice entry point for the cold air.

Cutting the lengths was easy using a reciprocating saw.



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I attached them to the box with normal screws.

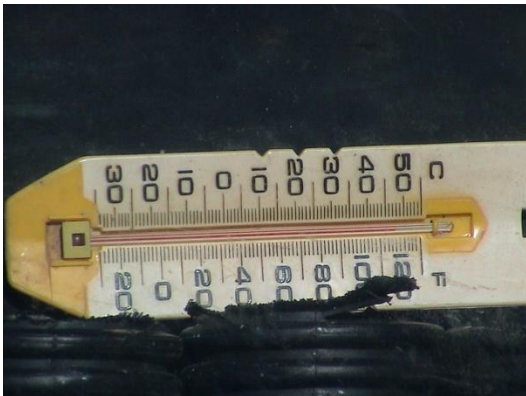
Once they were all in place, I added the window to ensure it fit properly.

I found that I had placed the pipe too high up and had to adjust them lower so the window would lie correctly at the top and seal properly.



I did a quick test with sealing the unit up and it worked very well.

The initial test was a success. You can see here that it hit over 110 in just a few minutes of direct sun. The normal temp at this time was @ 60 degrees, so I expect it to take longer to get the heat pumping when the unit is placed in 30 degree conditions.



Since this is a free standing unit, my next thought was how to design a way to move the heat to my garage window. You can see here that I drilled an exit hole and tried to pipe it in. I will keep you posted in future versions of this e-book.



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Free Materials or Low cost Materials for Passive heat



I am often asked about how to get the materials I use in my designs. More often than not, you have most of the items already lying around, in your garage or shed. Here you can see old 2x4's being framed into a box design.

With a little bit of vision, you can use scrap wood and black paint from other projects. It is not that difficult to find something that will work.

The biggest challenge may be the storm window and pipe material for the heat chamber. I had some old windows lying around but the pipe was from a drain project I had done previously. You can find storm windows through craigslist. I found several folks willing to get rid of these old windows that were just hanging around.

If you do not have this type of pipe, you can use old soda or beer cans. If you want to spend a few bucks, this pipe is available at the local home improvement store, in the plumbing section. Either way you go, it is well worth the few bucks you may have to spend to build your own passive heater.

It is not that hard and can be well worth the price of some basic materials.

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How to keep your Plastic 5 Gallon Bucket garden warm

Growing vegetables in the summer using [plastic 5 gallon buckets](#) is relatively easy to do since the air is warm and the sun shines bright. If you want to grow vegetables in the off season, it can be a bit more challenging to keep your plants from dying in the frigid temperatures.

A standard [greenhouse](#) is designed to collect sunlight during the day, and with good insulation, heat can be stored in heat sinks and



used to warm your bucket garden throughout the cold winter nights. Heat sinks are essentially storage units of water, stone or other insulating material that collect sunlight and transfer it into [heat energy](#). This energy collected during the day, becomes the heat source

and warms the air within your greenhouse when the sun is not shining.

Typical Heat sinks are colored black to absorb and retain the energy from the sun more efficiently and will naturally transmit that energy back into the air to keep a constant temperature for your veggies. Steel drums filled with water are the most popular as they are readily available, cheap and perform well as heat sinks.

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If you need additional heat during the day, you can add and a small portable solar heat furnace to help supplement the existing systems.

Whether you use just a heat sink or supplement

with a solar air furnace, your bucket garden will thrive if kept warm in the [winter greenhouse](#).

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Plastic 5 gallon bucket gardens can survive winter using a greenhouse and heat batteries

Container gardens are all the rage this year using [plastic 5 gallon buckets](#) to separate and grow the likes of tomatoes, peppers and other vegetables. One of the major advantages of bucket gardening is the portability that you get using this technique.

Since buckets are able to be moved, you can relocate your plants into other areas of your yard or patio for the best possible light as the summer days begin to shorten. When appropriate, they can be moved into greenhouses when the winter begins to become too cold for them to survive. [Small greenhouses](#) are able to create a micro climate that utilizes the sun in the day to keep the plants warm and away from the snow and ice. In addition, there are strategies you can use to keep the temperature constant in the evening when the frigid air, rain and snow would devastate your plantings if they were exposed to the elements.

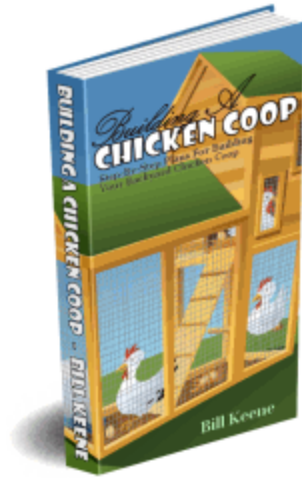
Heat sinks are storage devices that will absorb the sunlight during the day and transfer that much needed warmth during the cold nights when your vegetables need them the most. Essentially, these heat sinks become heat batteries for your greenhouse when the sun has disappeared for the day. Heat sinks are usually made from water filled steel drums, gravel filled concrete or even bags of water to absorb the energy and naturally emit that energy back into the air.

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Using the proper techniques, you can create a simple heat storage system that will provide much needed warmth for your *plastic 5 gallon bucket garden* in the off season.

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Make a Cheap Heater for your Greenhouse, Henhouse or your own house



Building a **cheap solar heater** is pretty easy to do for getting some free heat to be piped into your [greenhouse](#), [henhouse](#) or even your own house. I made my first unit from recycled materials I had in my shed and garage and within an hour created a simple design that cost me about 3 bucks out of pocket .

It is light, easy to cut and you can find it in most home improvement stores. It is typically used for French drains, but in this case, I used it for my heat chamber. Since it was already black, it was a natural fit to absorb heat and pipe it to the top of my solar furnace. I could have used aluminum cans for my [heating chamber](#) but did not want to drill any holes or paint them, so this worked well.

The basic principle of heat being generated from sunlight is not that complicated. If you have ever worn black clothes while in the sun, you will know what I am talking about. The color black naturally absorbs light and transfers it to heat. All you need is some sunlight and the right design to create free hot air to pipe into your living space or bucket [garden greenhouse](#).

Since I used plastic pipe and an old storm window, the enclosed box was fairly easy to put together from scraps I had in my garage. After sealing with basic tub caulk I had lying around, and some BBQ black paint for the inside, the heater was pretty much done and ready to go.

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I made a video showing the process and tested it in my back yard. After it was all done, I spent about 3 bucks on the materials I did not have leftover from other projects. A [cheap heater](#) is not that hard to make and can be adapted based on what you have available.

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