

## **Coke forge and sword!**

by [\[Tom\]](#) on October 16, 2006

### **Table of Contents**

License: Attribution Non-commercial Share Alike (by-nc-sa) .....	2
Intro: Coke forge and sword! .....	2
step 1: Materials .....	2
step 2: The forge - layout, construction and lighting .....	3
step 3: forging a blade and making good .....	4
step 4: The handel .....	5
step 5: Finished! .....	5
Related Instructables .....	6
Advertisements .....	6
Comments .....	6

## Intro: Coke forge and sword!

Hello!

First I will show you the long-ish ground forge, what i used, how I put it together and lit it, then how I made the sword blade (note not full tang) and handle ect.



### step 1: Materials

!!Important lots of heat and fumes given off so out side is a must for this type of forge, when the worked mettle is taken out it will be red-white hot, you will feel the heat from a distance so don't let it get any where near your or any ones skin or body or it will hurt, a lot!!

#### Materials

The materials needed for constructing a non-permanent forge depends on the size and shape, this forge was made for the job of forging the blade of my sword, so I will list the materials as if u was replicating this exactly (or kind of).

#### Forge:

- Building bricks with 2-3 holes, x8
- Solid building bricks (sand stone bricks not as good due to the heat) aprox x40
- Roofing tiles x5
- Breeze block x1
- Slabs x2-3 (depending on size of slabs)
- Hair dryer x2 (similar powers)
- Soft clay about 1kg

#### Sword (if making)

- Steel to work, suggest part of a small car leaf spring because of the high carbon factor and easy to work size another easy option is a car coil spring cut up. But for testing any steel can be used, a good thing to play with is reinforcing rods as you can make tongs for later use with the forge
- Length of reinforcing rod or other steel rod, 1.5-2 cm diameter and about 23 cm long.
- Steel plate about 4cm x8cm for hand guard, can use a section of leaf spring as I did.
- Wood for handle, 26cm x20cm and 1.5cm in thickness, suggest a hard wood because it makes turning a smooth finish easier.
- Bolt aprox 2.5-4cm brass or steel depending on preference.
- Washer, fancy as it will be on the hilt or but plane is fine.

#### Tools needed

##### Forge

- Making the forge
  - oHammer
  - oBrick chisel

##### Working the forge

- oBucket of water incase something happens (note tern off power to the hear dryers first, sounds silly but funny things happen when you panic).
- oWater but for quenching, if you need to make hard brittle items.
- oHeat proof gloves that reach up the arm.
- oTongs, I found mole grips very useful but longer reach tongs may be found safer for retrieving smaller items from the forge.
- oA solid lump of flat cast steel or iron. I used the back part pf a vice sat on a wall, this is far from ideal (just look at picture..).
- oSelection of hammers with different heads and weights, tack up to club.

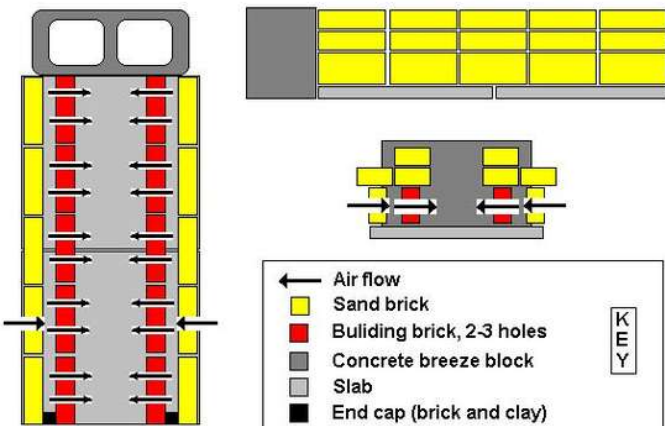
##### Sword

- Bench vice, on a bench this time.
- Lathe for turning handle, not a must but quicker than trying to plan it.
- Rounded chisel.
- Angel grinder for first sharpening and fine tuning.
- Bench water-stone, not a must but gives a better edge.

- Drill with sander attachment and a buffer attachment.
- Hacksaw .
- Tap and die set.

## step 2: The forge - layout, construction and lighting

1. First thing, find a good spot to set the forge up, not under any thing, where it wont have to be moved, but still shielded from any winds.
2. Place the slabs on the floor adjacent to each other with the breeze block at one end to act as the back.
3. This next part is the hardest to describe it's the making of the air ways, the object is to have even amounts of air flowing into the forge all the way along its length on both sides. Lay the solid bricks along the edge of the slabs on there sides from the back to the front on both sides of the slabs with a gap for the air in let in the middle.
4. Now place the building bricks also on there sides with the holes in them approximately 8cm away from the other bricks laying them from the back to the front.
5. To cap of the air way use the solid bricks laid so they overhang on top of the other bricks.
6. Lay another course of bricks on the inner wall to make it higher, some chopping of bricks will be required to make them fit. Studding the pictures will help but in the drawn one I have it with 5 rows of bricks when it should have 4 but this make no difference the principles are the same. It is beneficial to have a lip at the front of the forge to stop the coke from falling out.
7. The outlet holes that are most near the air in let need to be closed up slightly, using the clay make a rim around the holes halving the diameter and feathering off as it gets further away from the air inlet.
8. Rolling the clay into strips seal the bricks with the clay so that little air can escape. Do not attach the hair dryers yet.
9. Have the tiles near by as they will act as semi lid to keep the heat in once the forge is going. Set out the tools you will be using, the bucket of water, the water but, the mettle you will be working on and the thing that you have chosen to work the mettle on all out so that it is in easy reach.
10. The best way that I found to light the coke is to put the coke in that you need (up to the first two layers of bricks), then to burry some soft and hard wood in the coke then build up a layer of wood on top of the coke so that it is higher than the top brick. To light use lighting fluid or diesel, do not use petrol or methonal as they are far to combustible and will go out before heating up the wood so it burns properly.
11. Doing this should make a fire on top of the coke and once the fire has died down, heated up the forge and the coke underneath, attach the hair dryers and seal with some clay once attached play with the settings until you get the right heat. Don't have them on full if it isn't in use for a bit because it will burn up the coke and having them on full power may make the forge to hot as it can reach temperatures that will destroy the bricks and the mettle you are working on!



### step 3: forging a blade and making good

Take the (suggest hi carbon as lots will be lost in the heating) steel cut it into a workable size, but have the mass so that when it is drawn out it will be approximately 50 cm long.

Using tongs place the steel into the forge, put the tiles over the top still leaving gaps. If you have never done anything like this before you may now see in a new light why smithy's are depicted with arms like cow legs, it takes some time and effort to draw out that steel and shape it. When it is heated red-white hot it can be shaped, drawn out and cut with a chisel and hammer.

Once the desired shape is accomplished with a semi edge to it quickly quench it in the water but and then take out the blade so not to much heat is lost, let it slowly cool down, this will hopefully give some hardness and flexibility to the blade.

The easiest way to fix a hand guard is to cut a rebate up the blade slightly and make a slot in the guard. No easy task with leaf spring steel so plate steel may be a better option, just drill holes along where the slot wants to be and grind and file a-way until it fits the rebate on the sword. Cut a section on the bottom so that it can be rounded and threaded. It is hard to explain hopefully the picture shows what I mean. Drill a hole in both ends of the steel rod and thread them one to fit the sword and one to fit the bolt. It can be easier to weld the guard and rod to the sword but I prefer threading it so that I can disassemble it.

In a vice use the angel grinder to put an edge on the blade, and then refine on a bench grinder or water stone.

Clamp the blade in a wood clad vice so that it won't bite the blade and with the drill sander bit take off the rusty looking surface, to reduce the time polishing use a finer sanding bit, once sanded polish with the drill polishing bit and abrasive wax.



#### step 4: The handel

A easy way of making a round griped handle is to use four layers of wood, cut the plank into four strips grain long ways chisel a semi circle on one side of two strips of wood so that when put together it will slip up the handle. Nearing the top it will have to be chiseled out to incorporate the bottom of the blade. Once done glue together the two strips with the other two and clamp them together.

Once dry put the handle on sword and cut off the bottom overhand keeping 0.5-1cm so when the bolt and washer is put on and done up it will hold the handle on hard. You can ether carve, plane or turn the handle in to the wanted shape. I used French polish on the handle to finish it but it is up to you. If you do decide to do this or something like this it's nice to engrave the date and your name.



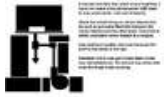
#### step 5: Finished!

I hope this has been of some interest as it was to me! I know there will be a whole bunch of spelling mistakes and that there are perhaps better ways of doing some of the things I have mentioned but this is what I done and enjoyed it!

Tom K



## Related Instructables



**Making a Simple and Easy Charcoal/ Coal Forge** by acer73



**How To Make A Bladesmiths** by trf



**How to Forge a Throwing Knife** by Vendigroth



**Forge a Knife** by jtabako



**How to Make a small Gas Furnace** by Vendigroth



**Aluminum Foundry** by StaticPhocus



**Make a Small Blacksmith's Forge** by Vendigroth



**Build a foundry and sand-cast aluminum.** by Fenris The bbw

## Comments

[50 comments](#) [Add Comment](#)

[view all 319 comments](#)



**Applejacks** says:

Aug 29, 2008. 12:21 PM [REPLY](#)

Dude sweet instructable I tried to make a forge a few years ago out of air duct pipe stuff and mattress pumps for bellows; BAD IDEA!!! I was trying to heat some roerd to make a knife but the pipe melted before it got hot enough lol. I liked your use of hair dryers too. Some advice DONT WASTE YOUR FREAKIN TIME WITH A FORGE IF YOUR JUST GONNA WELD ON A TANG!!!! The tang is like the most important part of the sword!

And a word to all you \*BLASPHEMERS\*: The katana is VASTLY superior to any other sword they make!! So there.

Just needed to get that off my chest =)



**PastTheVoid** says:

Aug 19, 2009. 11:08 AM [REPLY](#)

The reason they're superior in cutting and slicing is because of the way they're made. On the side not used for cutting people in two, a special clay is applied right before the katana is heated for the last time. Then it's dipped into salt water to cool the blade. In this step, the clay prevents the dull side from becoming brittle. Because of this, the dull end acts as a shock absorber.



**Kasaron** says:

Apr 22, 2009. 8:40 PM [REPLY](#)

Actually, the steel used in traditional Katana is regularly very poor(and in short supply), which required the traditional bladesmiths to work their very hardest to produce quality weapons made from less than quality materials.

There is no "ultimate weapon" because if there was, then that country would have decimated any other.

Katana, in particular, are not very effective against heavy armor, due to their thin width and thickness, which makes them less inclined to cause damage to the opposing metal.



**wizerd 745** says:

Jun 7, 2009. 10:05 PM [REPLY](#)

actually nukes are ultimate weapons and we have been on the brink of nuclear war a few times. however we try to avoid their use. they are used for intimidation.



**The Polar Bear** says:

Aug 9, 2009. 1:46 PM [REPLY](#)

Actually the ultimate weapon would be VX nerve agent. Odorless, tasteless, and is hard to see in it's vapor form. One drop of VX can easily kill hundreds. Any contact to the skin in it's liquid form makes you a dead man unless you happen to have an antidote for it which can only be found in certain military branches and The CDC.

Nukes you can see coming and intercepted. VX can be stealthy poured into a water supply or sprayed crop duster style almost anywhere in the world.



**Applejacks** says:

Aug 9, 2009. 7:03 PM [REPLY](#)

The ultimate weapon is a match.



**wizerd 745** says:

Sep 12, 2009. 6:17 PM [REPLY](#)

A match?



**wizerd 745** says:

Aug 9, 2009. 6:58 PM [REPLY](#)

K



**Kasaron** says:

Jun 8, 2009. 4:24 AM [REPLY](#)

There are missiles that they can use to shoot down a nuke in midair. They already did it to a satellite falling in a similar trajectory to prove it could be done.

That doesn't count the use of EMP weapons to render the detonator inactive, or the countless things they have stockpiled away just in case they need to stave off a nuke.

Nothing is unbeatable, mate.



**Kapt.kool** says:

Sep 9, 2009. 3:50 PM [REPLY](#)

Snake beats EVERYTHING!!



**wizerd 745** says:

Sep 12, 2009. 6:16 PM [REPLY](#)

For some reason the instructables robot gave me an email saying this was a comment to me, wierd .....



**imrobot** says:

Jul 7, 2009. 9:36 AM [REPLY](#)

there's still fall out, nuclear winters, and the fact that EMPs are very rudimentary at the moment. nobody uses nukes because the potential devastation to the rest of the world



**corey\_caffeine** says:

Aug 5, 2009. 3:13 PM [REPLY](#)

mirrors man  
the ultimate weapon  
milloions of uses : blades, focusing arrays, laser re direction devices



**Kasaron** says:

Jul 8, 2009. 5:24 PM [REPLY](#)

Rudimentary doesn't mean ineffective; an EMP warhead could be used to disable the electrical circuitry of an ICBM before it even breaks atmo, routing almost all fallout. Besides, if it's shot down fast enough, it'll send fallout over the home country of anyone silly enough to fire the blasted thing.



**wizerd 745** says:

Jun 8, 2009. 12:50 PM [REPLY](#)

I understand, I was just stating on their untold power. But still you're right, they can be shot down. :-)



**PyroManiac96** says:

Apr 7, 2009. 4:47 PM [REPLY](#)

katana owns 9mm handgun

[http://www.youtube.com/watch?v=pNiX\\_I-HEGM](http://www.youtube.com/watch?v=pNiX_I-HEGM)



**PyroManiac96** says:

Apr 7, 2009. 4:45 PM [REPLY](#)

katana owns claymore



**PyroManiac96** says:  
katana owns english broadsword

Apr 7, 2009. 4:44 PM [REPLY](#)



**tater killer** says:  
scottish claymore owns kantana

Apr 17, 2009. 8:04 PM [REPLY](#)



**PyroManiac96** says:  
depends whose the beter swordsman....perhaps we can get together sometime? to compare swords? FOR FUN? >:)

Apr 22, 2009. 7:49 PM [REPLY](#)



**Kasaron** says:  
Depends on if you don't mind me using my composite leather, wood and steel armor, high-carbon steel handaxe, and buckler shield.  
If you don't mind it, I'd love to have a nice, short live-steel match, provided you have good health insurance.

Jul 8, 2009. 5:27 PM [REPLY](#)



**PyroManiac96** says:  
i have very well health insurance. but as long as you dont mind me using a propane tank and a lantern sparker :P

Jul 16, 2009. 12:29 PM [REPLY](#)



**corey\_caffeine** says:  
spear owns all  
distance  
d-(\_)z

Apr 29, 2009. 2:05 PM [REPLY](#)



**astarion** says:  
actually, a crossbow gets better distance. :)

Nov 4, 2009. 7:18 PM [REPLY](#)



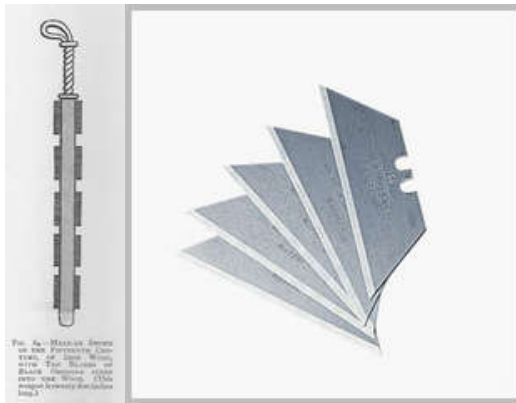
**Applejacks** says:  
I actually like a metal baseball bat, or it's medieval equivalent the mace. It's good for hitting things and you don't have to worry about cutting yourself.  
Or my fists...

Apr 29, 2009. 8:33 PM [REPLY](#)



**corey\_caffeine** says:  
I had an idea to make a Macuahuitl using utility knife blades instead of obsidian

May 1, 2009. 1:14 PM [REPLY](#)



**I\_AM\_NINJA** says:  
Cool, I can actually do that.

Aug 4, 2009. 8:48 PM [REPLY](#)



**volquete** says:  
thats a good idea, you should try it.

Jun 9, 2009. 10:37 AM [REPLY](#)





**PyroManiac96** says:  
...OW

May 10, 2009. 11:53 AM [REPLY](#)



**PKTraceur** says:

It really depends on what number sword you mean. A number 5 sword is superior to a number 3 katana. When I mena number, a long time ago, the number was determined by how many people it could cut through before getting "stuck."

Nov 18, 2008. 1:58 PM [REPLY](#)



**ninja guy** says:

<http://www.instructables.com/id/How-to-wrap-a-samurai-sword-handle/> Here is how to wrap the handle so it looks beter

Aug 11, 2009. 2:09 PM [REPLY](#)



**I\_AM\_NINJA** says:

Wow, it appears that MS Paint is actually good for something, because the instructions made sense once I looked at the diagram. I can imagine that it was hard to explain, because it was a little hard to understand. I might have to try this eventually. I wish I could do it right now, but A) I live in a suburb, B) I don't have any steel to work with, C) I don't think the women of the house would be very appreciative of me utilizing their hairdryers in this way, and D) I am only 14. I really do wish I could, though. I could use a couple of katanas in preparation for a Solanum outbreak. Guess I'll just ave to stick with my crowbars for now.

Aug 4, 2009. 8:46 PM [REPLY](#)



**elmoiq3** says:

I liked the zombie reference.

Aug 9, 2009. 2:43 PM [REPLY](#)



**doodoodoo** says:

gonna call BS on this sword so many things left undone and unsaid

Jul 26, 2009. 12:24 PM [REPLY](#)



**sthealthraider** says:

Hello! can i use rebar?? thats i think the easyst thing i can get

Jul 8, 2009. 10:34 AM [REPLY](#)



**Imuli3** says:

good idea but plz ad more pictures so i can see what is going on

Jun 3, 2009. 11:24 PM [REPLY](#)



**yofortune** says:

Hey dude nice sword ill totally buy one of you can you custom make mine i cant make a forge at home :(ill pay about 15\$ for 2 thats all i have can it be a scimitar with the name "yofortune" on it?please reply.

Oct 1, 2008. 5:24 PM [REPLY](#)



**jfkendall** says:

Hi Yofortune! I know that the folks here got on your case about the \$15 bid but the fact that you offered it and showed appreciation for the work was great! I know how it is to really feel like you'd love to have something and not have the cash to make it fly. I really hope Tom and these other people can appreciate your enthusiasm for the work. I know that I've done projects and even though the person who saw it couldn't give me enough for a profit, I appreciated the interest and support. Who knows? Someday maybe you'll be the artist or the patron!

Jun 3, 2009. 4:42 PM [REPLY](#)



**jfkendall** says:

Hi Tom!

Thanks for introducing this topic in this instructable. I'm just beginning to think through the ideas of furnaces and forges and the fact that you were able to get the results that you did are really encouraging. I know that the folks who write in and argue about the tech stuff can be right but I felt that you should be given some praise for the "old college try". Everything I've ever done I got better at with practice and this task is very daunting. I hope you will submit more stuff and keep at it.

Jun 3, 2009. 4:31 PM [REPLY](#)



**four\_eyes954** says:

you've gotta be kidding me r u like 10 or something you couldn't get a personalized plastic blade for 7.50

Nov 16, 2008. 7:05 PM [REPLY](#)



**Lance Mt.** says:

TRY going triple digits man.. (sigh)

Nov 7, 2008. 1:34 PM [REPLY](#)



**TheMadTinker** says:

Oct 2, 2008. 6:45 PM [REPLY](#)

This is a most unprofitable proposition to offer to any skilled laborer. Ignoring the cost of the materials that would be required to fulfill such a request, the time required to forge even a small blade is worth well over \$15. Consider that it takes a skilled bladesmith several hours to beat a small knife from stock; if it took only three hours to make your requested blade, that would value the labor at only \$5/hour, which is under the national minimum wage. Further, blacksmithing is about much more than just making blades; it takes time and effort to learn to make basic things with naught but a hammer, anvil, and tongs.



**Bisquick** says:

May 31, 2009. 1:50 AM [REPLY](#)

I've been forging knives for years, and had a few attempts at swords and machete's. From what I understand the really really good swords of this type are made with high carbon steel that is folded (damascus) a few hundred times, and then into an ingot, then split in half. Sandwiched between the two pieces of the ingot you place a softer steel or just iron and then draw out the blade. The reason being the back of the blade will dampen the blow when the sword is turned around to block, while the edge is high carbon razor sharp goodness. Also it will have a little give and bend slightly instead of being brittle and just breaking. After you draw the blade out and shape 90% of what it is going to look like finished, you touch the blade up with a grinder and some finer stones until the blade looks about to where yours is at. That's where the next part comes in. The marks are spots where clay is placed, when you dip the sword in the water after being cherry red you drop the sword in water and all of the carbon releases to the surface except in the spots where the clay was. This is to dampen the sides, as well as often times embellishments. Once this process is finished, it is sanded with fine paper, then fine clay which has a very slight grit to it. Finally buffed, polished and engraved.



**ijt25** says:

May 26, 2009. 2:05 PM [REPLY](#)

Excellent instructable mate, gives a good and basic idea on blade making.



**DAVEDIY** says:

May 13, 2009. 12:21 PM [REPLY](#)

NOW THAT IS VERY COOL!



**Timmyboy** says:

May 4, 2009. 2:30 PM [REPLY](#)

at 12:47 i posted my last comment and 10 minutes after that i began building my forge and the pit(using toms plans(which i must say are very nice) and at 2:20 p.m. i finished the forge. i havn't tried putting air through it but i can already see that it will work. now im going to go back out there and use toms plans to start the fire. also it only cost me \$32 to buy all the materials for the forge(i only bought 25 bricks because i made mine shorter)



**Timmyboy** says:

May 4, 2009. 12:47 PM [REPLY](#)

what you can do to keep some of the heat from being sucked into the ground is....dig a pit by these dominations or by the dominations of your forge 16 inch wide, 10 inch deep(use this depth even if you change the other dominations) and 32 inch long.....take some 1" gravel and put 3" of it in the pit. then take pea gravel(about 1/2 inch or 1/3 inch) and fill 3" agine.then fill the rest up with sand(4" of sand) stamp the sand and build your foundation over it.(you should put concrete slabs over the pit) the sand will suck up all the moister that originally would go to the fire..then the fire will just evaporate the moister..simple yet effective.



**anvil\_man** says:

Feb 5, 2009. 11:44 AM [REPLY](#)

New to this site, For all the blacksmiths and metalworkers,

for your questions on coal and coke, metals please check out [www.abana.org](http://www.abana.org) or [anvilfire.com](http://anvilfire.com) lots of good INFO

G



**Kasaron** says:

Apr 22, 2009. 9:26 PM [REPLY](#)

don't forget iforgeiron.com ! For shame!

cheers.



**vladj** says:

Jan 16, 2009. 7:06 PM [REPLY](#)

Bullshit. Yea I definitely gotta call bullshit on this sword. None of it makes sense. We go from chunk of metal to fully finished blade without any pictures, and man that is a long and complicated process. Rat-tail tang? On a hand forged sword? On a katana? That's absurd. All that work and you just decide to go with the weakest tang imaginable? Even the good Chinese knockoffs on ebay have full tangs. And if you really blacksmithed it, a full tang is easier to make!

The hardening/tempering is also wrong. The blade has a slight curve and a hamon line, both of which are caused by differential hardening. Well that or lazer cutting a curved blade from sheet metal and etching a hamon line in a Chinese factory. You describe quenching for a short time then pulling it out before it is fully hardened. I've never heard any blacksmith recommend that nor have I found it in any books.....because it doesn't work. You quench till cold to get a hard but brittle blade, then temper(heat to about 500 degrees, 1/3 forging heat) to make it somewhat softer and less brittle. If it's a katana you coat the back of the blade in clay before you quench to slow the cooling there and get the curve and hamon line. That's that differential hardening I talked about earlier.

Grinding: You grind before you quench. First you aneal(let it cool as slowly as possible) to get the swords as soft as possible. then you grind, then you quench then temper. If you grind after quenching you'll just waste your time and ruin sanding belts on a super hard blade. If you grind after tempering you'll also burn through belts and more importantly you'll probably ruin the temper and have to repeat the quench, temper, and polish steps. Oh and the thought of taking an angle grinder to a katana blade makes me cringe.

Now I hope you're just faking the swords part and used it as a prop. If I'm wrong and you actually made it like you said you did then mad props on your initiative, really, that's darn impressive, but do yourself a favor and read a book on bladesmithing before you do your next blade. What you have looks nice, but there are some simple and critically important things that differentiate a real sword from a chunk of metal that just looks like a sword. Wack it against a helmet, or even a tree and you'll see the difference.

---

[view all 319 comments](#)