



Scout Project: How to build a Trebuchet

by **Biggsy** on April 5, 2010

Table of Contents

Scout Project: How to build a Trebuchet	1
Intro: Scout Project: How to build a Trebuchet	2
Step 1: Ingredients	4
Step 2: Get knotted!	4
Step 3: On the Lash!	5
Step 4: All your base are belongs to.....	6
Step 5: A FRAMES... Doo da doo doo ... dun dun dun	7
Step 6: Projectile arms!	8
Step 7: On the Lash again!	9
Step 8: Projectile arm 1	10
Step 9: Projectile arm 2	12
Step 10: Counter weight / Rope pull	14
Step 11: Ammo buckets!	16
Step 12: Now go forth and Siege towers!	16
Related Instructables	19
Comments	20



Author: Biggsy Jays Big Adventure

I'm an un-repentant mess creator... I'll turn my hand to anything and providing i get my fingers back... I'm happy. Feel free to find me on twitter @BiggsyJay

Intro: Scout Project: How to build a Trebuchet

So for whatever reason, the front page of my Instructable is blank... after me writing (in my opinion) a pretty cool opening... Damnation! Well... lets try this again huh?

Well... welcome to the second installment of my Scout projects... In this Instructable, I shall try to show you wonderful people how to construct both miniature and true scale WORKING Trebuchets!

A trebuchet by simple definition is an ancient form of long range weaponry, which uses the combined force of gravity, and a pivot point to propel an object.

As previously explained, I am a Scout leader, and I find that, doing is better than listening, by getting my Scouts to build something using the skills in these following chapters, they can see the context and usefulness of a particular knot, lashing or method. Plus they have a damn good time flinging things across fields and alike hehe (don't we all!)

I have found the need to draw some of the processes due to my photo's not being too clear... All I ask is that you don't be an asshat and pass them off as your own. If you want to use them in another I'ble let me know.. I am a reasonable adult.

So sit back... enjoy... and lets get building!

NB: Whilst I'm not going to insult your intelligence, I am going to assume you readers are fairly responsible... but on the off chance that your an idiot, I am going to make this PERFECTLY CLEAR... I take absolutely NO responsibility for any damages or injuries sustained (either to yourself, people around you property or environment) during the manufacture or use of this Item. Everything you do is at your own risk, and I am in no ways liable for any of your actions





Image Notes

1. This is me... when I first hurt my knee... I got bored, and built a trebuchet... AND YES that is a dog biscuit as a counter weight



Image Notes

1. I'm taking the picture!



Image Notes

1. I'm the one taking the picture

Step 1: Ingredients

For the miniature Pioneering, you need almost EXACTLY the same for the large scale... except of course since instead of bamboo bbq sticks, you can use something a little more substantial, like telephone poles... or pioneering poles... tree trunks... whatever you have to hand. Also, you'll be wanting to use some really good quality rope... nylon will do... but it doesnt hold a knot fantastically.



Step 2: Get knotted!

The next I'ble I post will be a 'how to' on Clove hitches, the most useful (in my opinion) knot.

For those who already know how to tie a clove hitch, you will notice that in the last two steps, I push the rope end under the top loop, instead of the bottom, I find this adds extra stability to the small scale I'm working with. So yes ok... it's not TECHNICALLY a clove hitch... but it gets the job done.

Parts of a Rope:

The End: In the picture, the 'END' is signified with the green tip. The End is the part of the rope you are working with that will eventually become a knot.

The Bight: Is the central part of the rope, between the 'End' and the 'Standing part'... A Bight is also bend in the rope that does not cross back across itself.

The Loop: A Loop is a bend in the rope that DOES cross itself.

The Standing part: Is the part of the rope which will not be part of the knot you are tying

With out getting TOO technical I will try to explain how to Tie this knot, If yuo get confused... I have staged the pictures so you can see what im dooing.

1. Throw the End of the rope across the object you are working with. As in image 1.
2. Take the End and make a x shape (lay the End over the Bight) As in image 2.
3. Take the End, and bring it round the back of your x shape (so now it resembles a figure 8) As in image 3.
4. Bring the End of the rope up, and under the top of your figure 8. As in image 4.
5. Pull the End and the Standing point tight to form your knot

Clear as mud? Well... there are ALOT.. I MEAN SERIOUSLY LOADS ... of these to tie.... you'll get the hang of them i'm sure! hehe



Image Notes

1. Image 1.

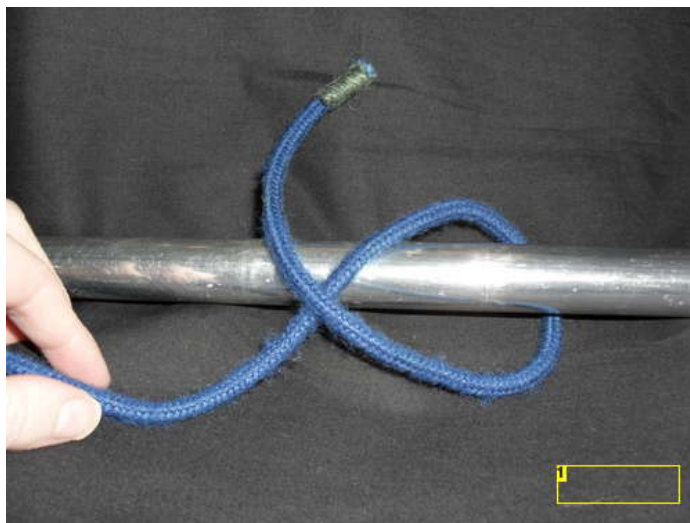


Image Notes

1. Image 2.

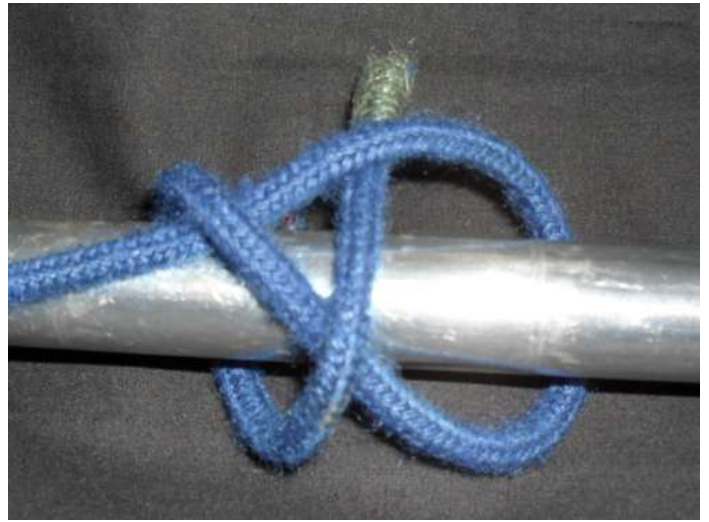
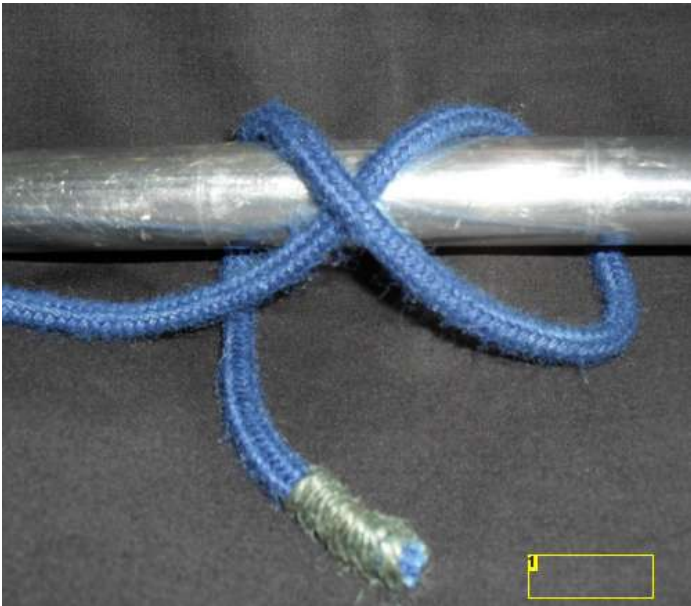


Image Notes

1. Image 3.



Step 3: On the Lash!

Okay, so if you can't understand my description/ diagram have a look at this website http://glenn.cockwell.com/scouting/creating_a_square_lashing.htm It should help you better than I.

So okay, start with a clove hitch... then, wrap your rope under, and over the crossed pieces of wood you wish to join together. keep going over and under (I usually go about 3 times on the miniature scale)

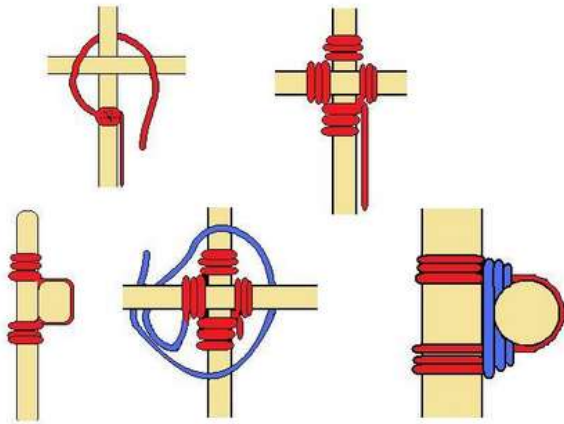
Pull the lashing tightly

Now take the 'End' of the rope (the blue bit on the diagram) and wrap it about the lashings you have just tied.... (I usually do it about 3 times on the miniature scale).

Pull everything nice and tight

Finish off your square lashing with a clove hitch

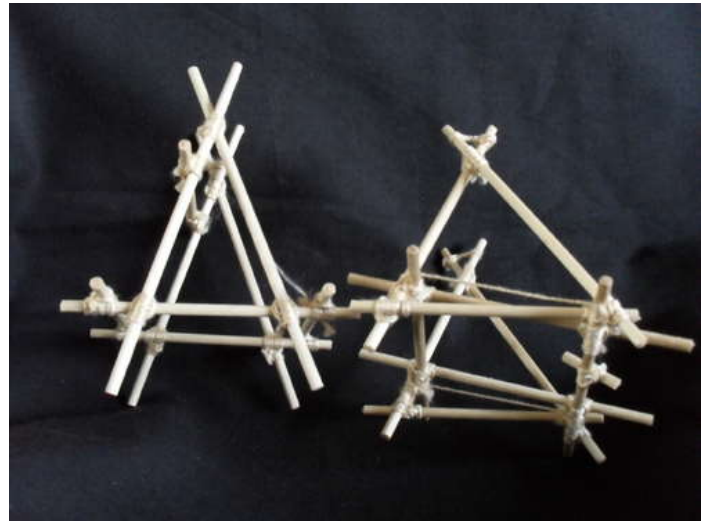
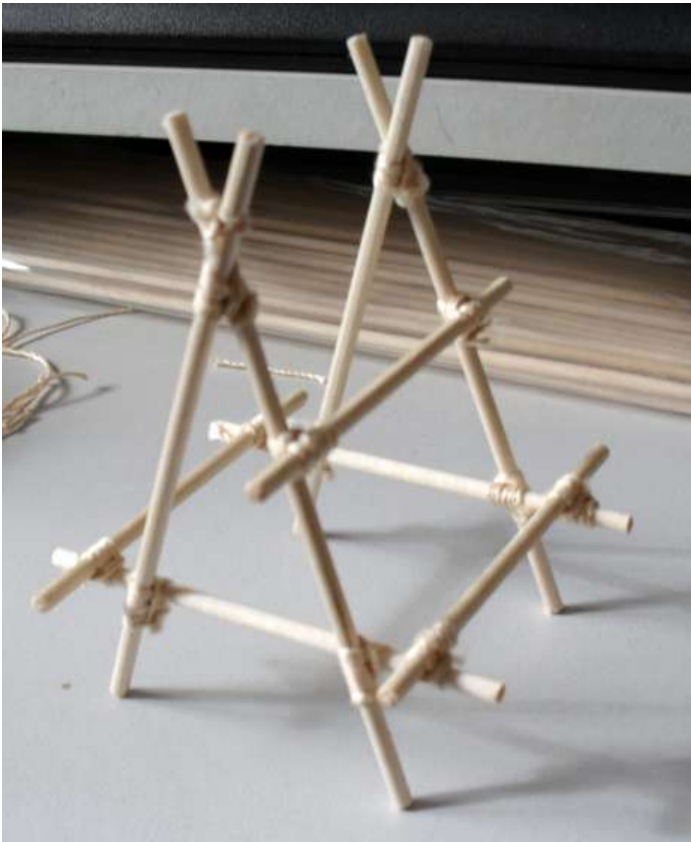
Square Lashings

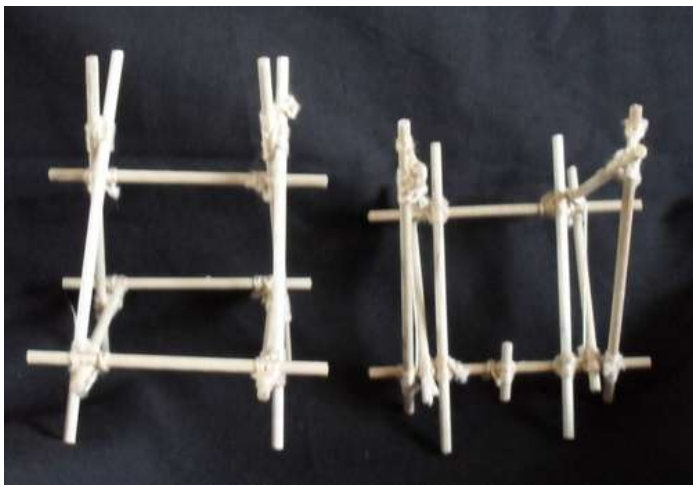


Step 4: All your base are belongs to....

In the next section I'm going to go into A Frames, which form the construction for the most stable bases that I use on both scales. There is one other, which forms a 3d pyramid, but since I couldn't draw it... I haven't included it here :)

You *SHOULD* be able to see how to construct the bases from the pictures below, just go for what you fancy, once you have the basics down, why not go nuts and add some supports, wheels... whatever you fancy





Step 5: A FRAMES... Doo da doo doo ... dun dun dun

Okay so the ATEAM and the AFRAME doesn't have anything to do with one and another... but well... IT kept you guessing didn't it?

Okay... well Aframes, form a large portion of this project... The only difference in my two bases is that one has different supports to the other... Supports I class as anything that holds the two sides of the base together... In Diagram one (on the left) I show two supports, and the one on the right shows three... On a miniature level, they are essentially just to keep the whole thing together, or for decoration... but on the larger scale, you will have to think long and hard as to where you can lash supporting beams and to that effect they will have.

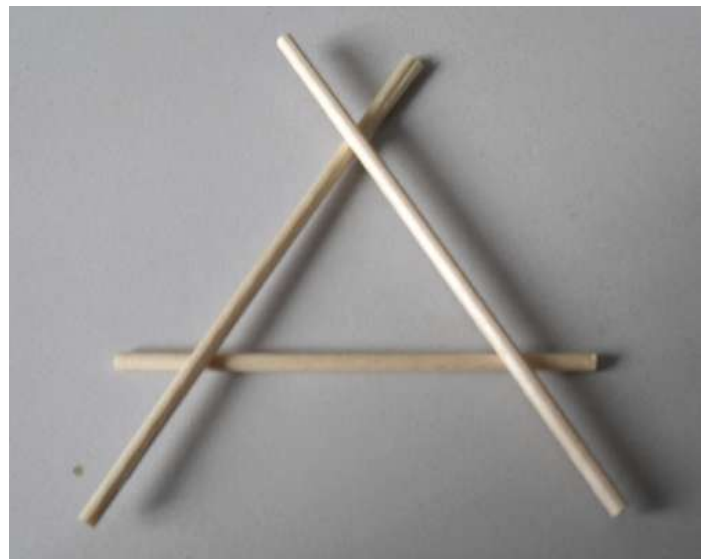
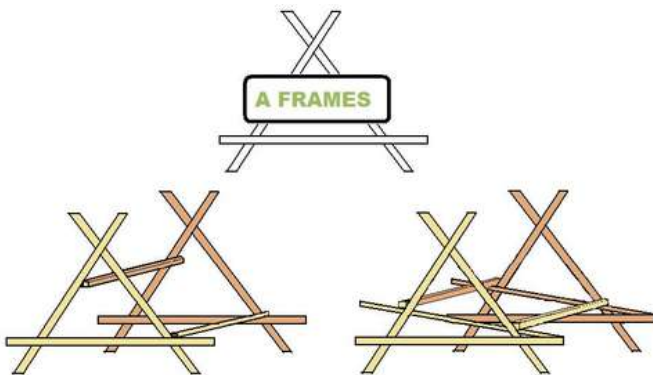
Picture two shows the construction of an A frame prior to being lashed together... For this I would use the square lashing... See what I mean about having lots of opportunity to practice your clove hitches? hehe

Picture three, gives you a side on view on how I construct my miniature bases...

Picture 4 shows how I use horizontal supports on the inside of the trebuchet to hold the frame together (like the one on the right in picture one) I also have added side supports using square lashings (yes I know... MORE OF THEM!) to give better support when the weapon is in situe

Picture 5 is an up scaled version of picture 4 (in fact 4 was the prototype for pic 5, I found it useful to have a visual aid as reference material for the Scouts to build their own)

So go nuts, and remember to think about support and stability. On a large scale its inportant to think about strength, and saftey of those in the immediate vicinity. You don't want the whole thing falling down do you?



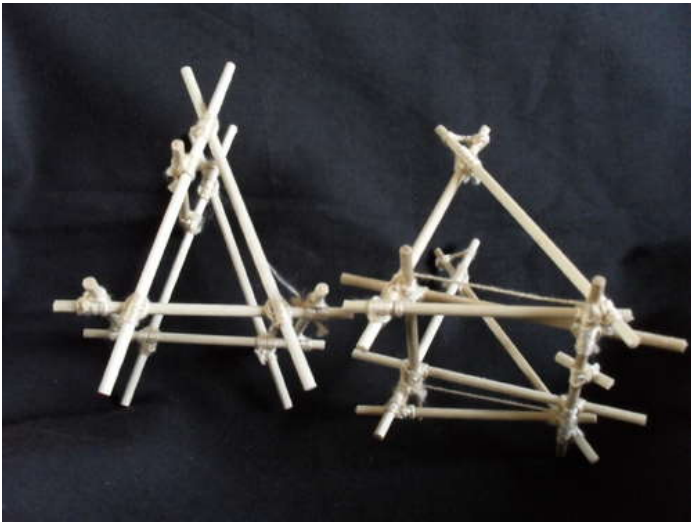


Image Notes

1. This is me... when I first hurt my knee... I got bored, and built a trebuchet... AND YES that is a dog biscuit as a counter weight



Image Notes

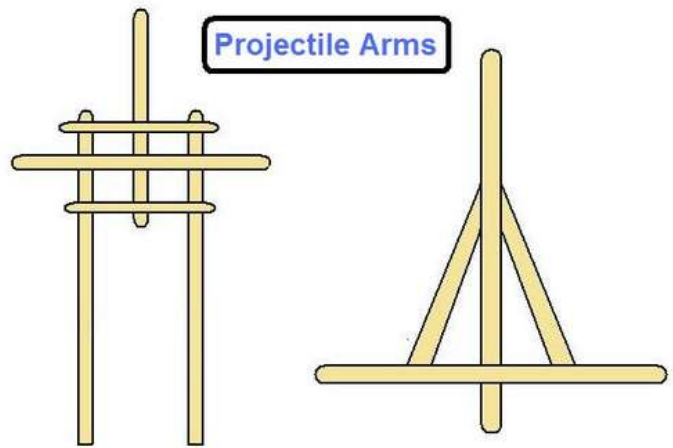
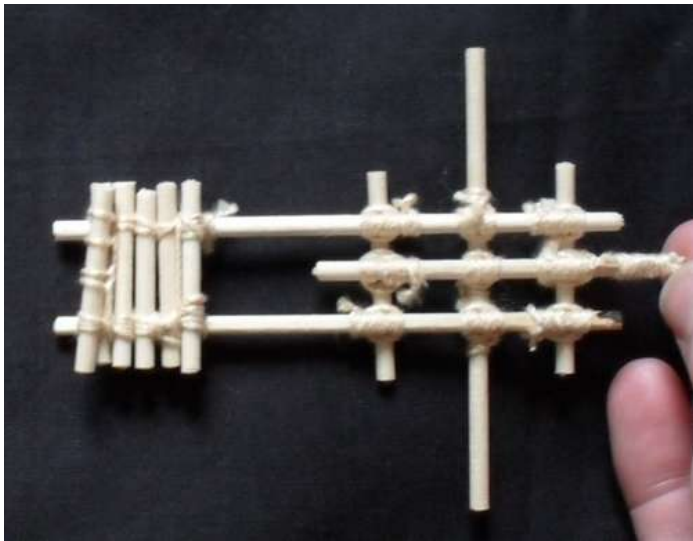
1. I'm taking the picture!

Step 6: Projectile arms!

WELL, now its getting exciting. In the next few steps I shall go into construction of the weapons arms... these are basically pieces of wood... attached to a pivot, with a weight or a rope at one end.... and a receptacle for holding your projectile, be it decapitated Romans, or footballs

The ones I have made here scale up really well, infact when I tend to build big trebuchets I go for the design on the left, as its a little more simple.





Step 7: On the Lash again!

So the next lashing I want to touch on briefly, is one that is called a tripod lashing, so called because you use it to make tripods ... Schimples!

so take your three pieces of wood and line them next to one another. I (unlike the website below) Like to start with our old friend mr Clove Hitch

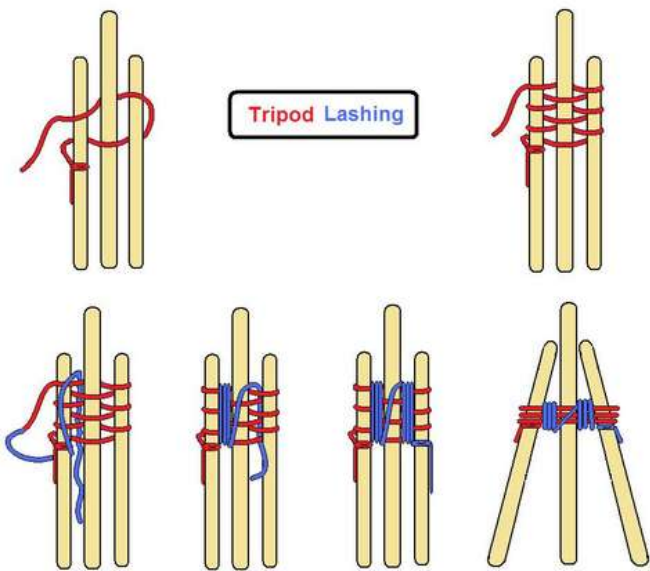
I then weave my rope, over and under the poles (top left) until I get something resembling the top right diagram

Using 'The End' (blue in diagram) I then wrap AROUND the lashings I have just made (like the bottom two diagrams on the left) I then pull them tight, and do the same on the other side, and finish the lashing off with a clove hitch (bottom center right)

you should now be able to make a tripod securely from your three pieces of timber (bottom right)

Clear as mud?

This website may explain it better than I can: http://www.bsatroop542.org/Knots_TripodLashing.htm



Step 8: Projectile arm 1

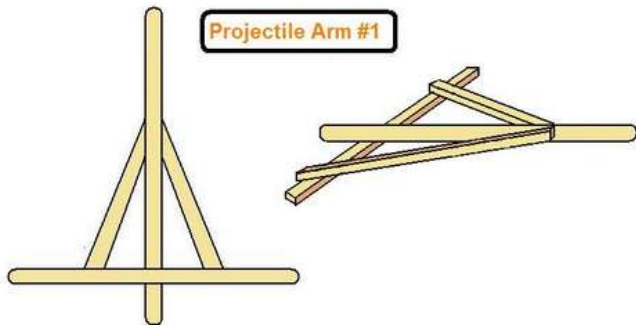
So, luckily, I have more pictures for this arm... So you can at least get an idea of how to make the simple projectile arm... For Arm 2 you'll have to put up with my drawings...

This arm is made up of three square lashings and one tripod lashing.

Image 2 gives you an idea of the construction before being lashed up

First you want to start by making a sorta crucifix shape like in picture 3. Then by adding your two side pieces (that make up the support for the arm) using, you guessed it ... SQUARE LASHINGS you should get a ...fork shape.. Like in picture 4

Now, using the tripod lashing that you saw in the last step... lash up the top end, to make the shape of image 5!







Step 9: Projectile arm 2

So, okay... this is perhaps the more complicated projectile arm... AND I don't have any pictures of its construction... aren't I wonderful? (Don't answer that!)

Now... I'm sure if you look at the finished product you'll see whats going on...

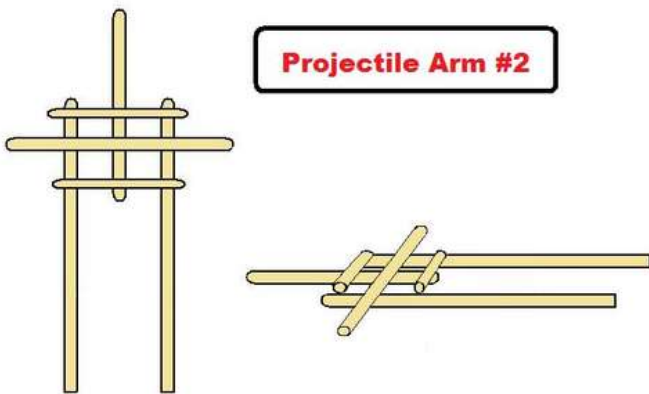
This arm has 9 square lashings!!! (that means 18 Clove Hitches! hehe) So you'll be cursing me by the end of this part of the project if you havent already started dooing that.

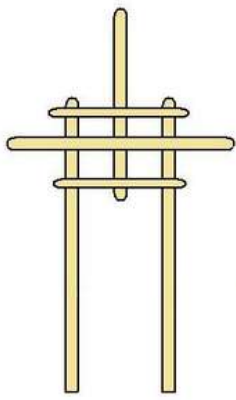
Firstly I would start like in the last step, by building the mid-section, this is the crucifix like bit where you attach a vertical peice of wood, onto your pivot which will be on the vertical plane (or whichever way round you fancy hehe)

I would start with this mid section, as, when I was building my version in the small scale, I didn't and ended up trying to do the mid section last....

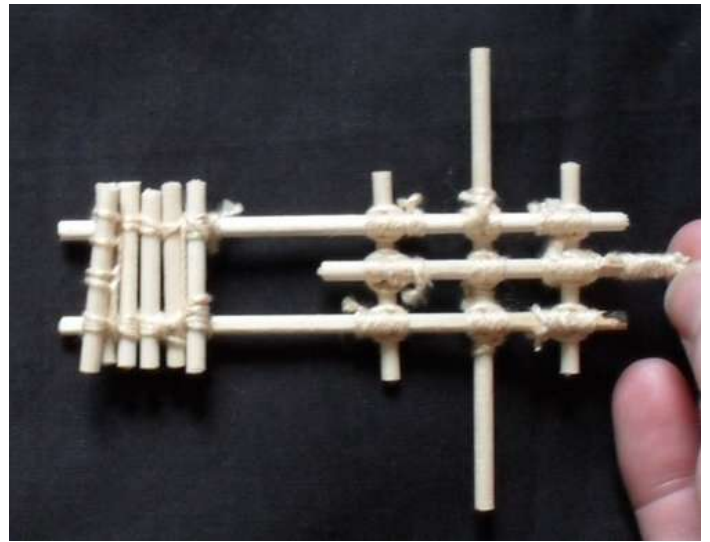
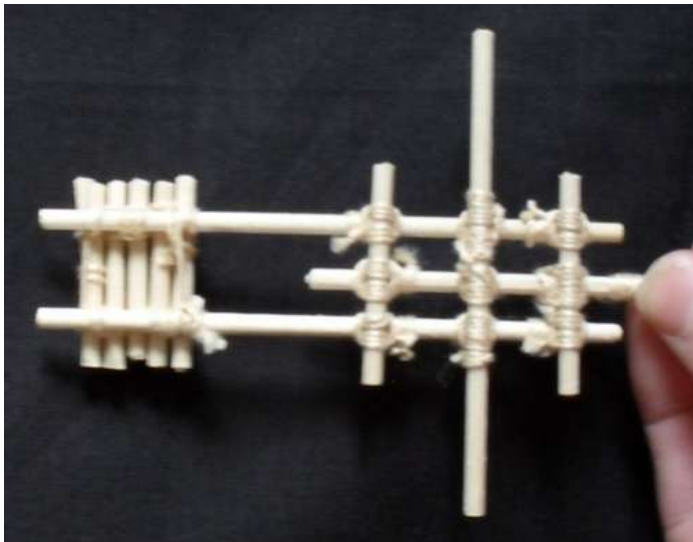
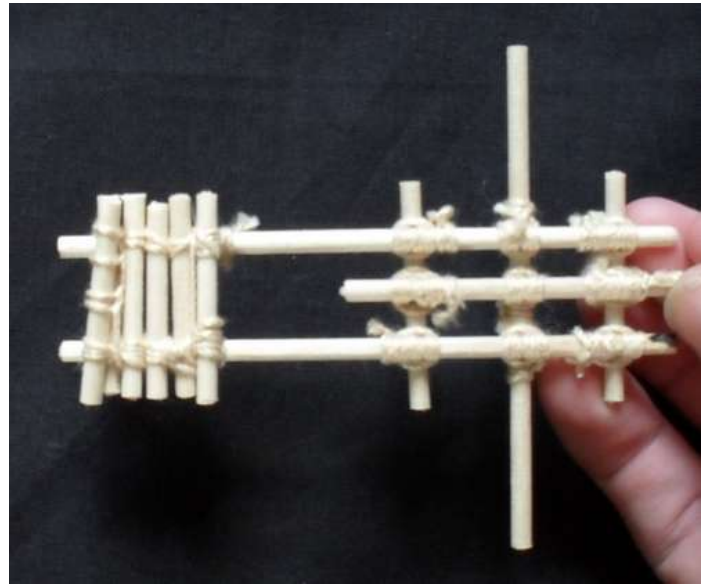
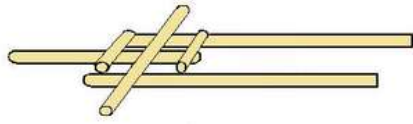
I would then, lash on (in what ever order you fancied) the other vertical and horizontal bits.

In this arm, I would keep all horizontal parts 'on top' of the vertical ones.... It aids in balance, and makes it easier attaching the bucket on at the end.





Projectile Arm #2





Step 10: Counter weight / Rope pull

Depending on the size and location of your trebuchet, you need to pay careful attention and think hard about what method of propellant you wish to use.

In the small scale I have built one of both methods... One using gravity / a counter weight and one using Man [grr] power

I have built large scale ones using both methods, and find the counter weight ones the more useful for heavier objects, providing you have space and the ability to wield it safely. If using the counter weight on the large scale... remember to attach a rope to the projectile end (where you put the ammunition), else, you won't be able to load it, because of that pesky gravity!

On the small scale, for the counter weight I have used the ball out of an old computer mouse... Perfect size and weight for a 4" model... All I did was cut a square of cloth, and sew my ball into it, then using some more string, I tied it on to the middle most pole... and Brians your uncle... you have a counter weight!

The only thing I would advise on the rope pull method, is to perhaps arrange the rope, so that you are not in front of the trebuchet, or below the trebuchet when launching... as its just not safe!



Image Notes
1. I'm the one taking the picture



Image Notes

1. I'm taking the picture!

Step 11: Ammo buckets!

Having not exactly worked out how to build a projectile sling, I tend to use the ...low tec approach... Anything from frying pans, to washing up bowls, to glue gunned cardboard... providing you can attach it, and it will hold your ammunition (without affecting its propelled exit) then go for it.

In the miniature scale, anything from pop bottle lids, to cardboard will do... go nuts and use your imagination



Step 12: Now go forth and Siege towers!

Well, thats it... hope you have enjoyed this... Its been an ABSOLUTE pig to draw, compile, write and edit.

Let me know how you get on

Cheerio

-Biggsy

PS: when I get round to it, I will upload the vids to here, but in the mean while, here are the links to the ones on my facebook page:

<http://tinyurl.com/y9tfp39>
<http://tinyurl.com/yck5h6u>
<http://tinyurl.com/ybmlssc>
<http://tinyurl.com/y8f32vb>

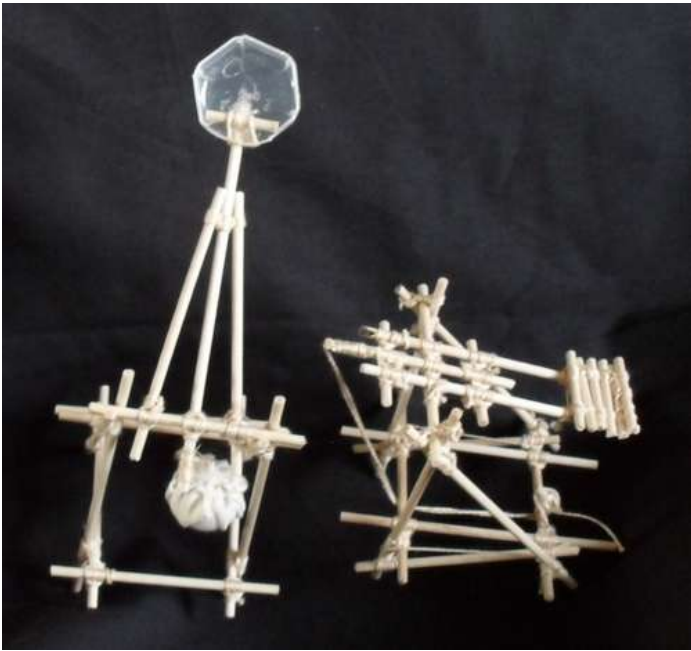


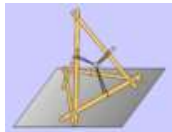




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Related Instructables



How to Make a Desktop Viking Catapult (with a bonus wargame to play). by Kiteman



how to build trabuchet (Photos) by adornakimpura



Trebuchet (Photos) by qwerty987



Popsicle Stick Trebuchet (Photos) by prosper58



Desktop trebuchet from bicycle frame by Visitor




"The Insensible" - a counterweight trebuchet by squiggy2

Comments


13 comments [Add Comment](#)

 **iamgamer3** says: Jun 2, 2011. 6:08 PM [REPLY](#)
that really didnt make any sense, but at least i already know how to tie a knot lol. Great job by the way. i hope you dont mind but im going to use this for a school project.


 **Biggsy** says: Jun 3, 2011. 6:07 AM [REPLY](#)
Aslong as you send me a picture of how well it turned out :)


 **iamgamer3** says: Jun 3, 2011. 1:05 PM [REPLY](#)
well my teacher made me take it apart because some of the dowels were his but im going to make a new one when summer starts

 **Biggsy** says: Jun 3, 2011. 1:06 PM [REPLY](#)
well bbq sticks and cotton works really well :)


 **Silver Buttons** says: Mar 3, 2011. 8:36 PM [REPLY](#)
I love the word "trebuchet." I want a bumper sticker that reads:
WHEN TREBUCHETS ARE OUTLAWED, ONLY OUTLAWS WILL HAVE TREBUCHETS!


 **Biggsy** says: Mar 4, 2011. 4:53 AM [REPLY](#)
hehehehehe


 **Kofoed** says: Jan 14, 2011. 1:28 PM [REPLY](#)
me and my scout group once made a "full size" (+/- 2 meters high) Trebuchet, it shot 70 meters or about 230 feet :D it was so cool but unfortunately it broke the first or second time we shot it, and we haven't rebuild it xD

 **Biggsy** says: Jan 14, 2011. 2:01 PM [REPLY](#)
We once built two trebuchets and fired water balloons at one an othr... that was good fun

 **tim_n** says: Jun 17, 2010. 12:37 PM [REPLY](#)
Amazingly over engineered - we do this with elastic bands :) I've just been doing some full scale projects, working my group up to building a full size pioneering trebuchet.


 **Biggsy** says: Jun 17, 2010. 3:03 PM [REPLY](#)
In all honesty I loathe green garden stick/elastic band pioneering... I don't think it teaches the kids anything.... when I build /pioneer with my scouts, we use nothing smaller than broom staves, so they can lash and knot... I don't see the point of dooing the activity otherwise.... Elastic band pioneering perhaps is good for beavers and younger cubs... but i dont think it can replace the knot work...

 **desequer** says: May 14, 2010. 7:22 PM [REPLY](#)
Nice Clean lashings. What is the overall size of your scale model? also what size of twine have you found works well with this size of project?

 **Biggsy** says: May 16, 2010. 2:00 PM [REPLY](#)
To be honest on these small scales, embroidery cotton works just as well as what I used... not sure about the sizeing of the yarn... It's similar strand width to that of embroidery silk, I haven't a clue where I got it from... But I tell you what would work really well, is the waxed cordage you can get from craft shops such as Hobby Craft (in the UK)

If its any help... the reel the yarn is on says:sylko Perle' 250m....sh.736 no.5 bey(think thats the colour)

the smaller trebuchets are about 3 or 4 inches high... I can't put my hand to a ruller at the moment, but I hope that helps :)

 **Biggsy** says: Apr 17, 2010. 11:38 AM [REPLY](#)
Hmm apparently this l'ble has been Featured... but no funky banner yet.... All in good time I imagine....but well... YAY me ;)
