

Wire Armatures for Dolls

There are 2 basic ways for making a doll with an armature:

1. creating a pattern for the body pieces, inserting the wire and stuffing around it
2. creating head, hands, and possibly feet, attaching them to a wire armature and using batting (wadding) or similar and building up the body

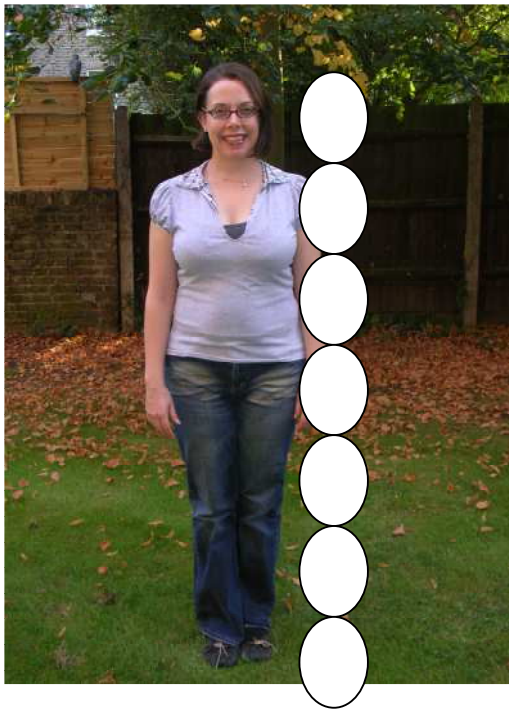
This tutorial covers one method of creating a wrapped body armature.

First you must have a head, hands and possibly feet pre-made. You can use this method with polymer clay, paperclay or cloth (or a combination). If you are using clay then the wire must be imbedded in the clay before being fired or air dried.

For cloth you can insert the wire into the head after sculpting. However, with the hands you need to wire the hands so that there is a long piece of chenille stem or pipe cleaner protruding from the arm. Then stuff the fingers, hand and wrist around this wire. One way to do this is to wire the fingers then use the thumb wire to wrap around the finger wires and then extend that thumb wire up and out of the wrist. (this is how Patti Culea wires fingers) With this prepped you can begin to decide on the proportions of the body of the doll.

Body Height

The average human being is 7 ½ heads tall. Renaissance artists used an idealised proportion of 8 heads tall. Keep in mind that this is just an average and is not a hard and fast rule.



Here's a picture of me and as you can see I am only 6 ½ heads tall (can't ever say that I'm average!). I am only 5'2".

Try this: take a full body picture of yourself standing straight and see how many heads tall you are. This will give you an idea of how tall your doll would be in relation

to yourself. Are you creating a dwarf? How much shorter than yourself would that dwarf be? 4 heads tall? Are you creating a tall willowy model? How much taller than you would she be? 8 heads tall?

Once you've decided how tall (or short) your doll will be measure the dolls head. Then multiply that measurement by the number of heads that you would like the height of your doll to reflect.

Example:

Let's say your doll's head is 3" from top of the head to the bottom of the chin and you have decided to make him into a little fellow (an elf) only 4 heads tall. That means his total height should be 12".

Step 1: On a sheet of paper draw a line the height of your doll.



Step 2: take your piece of paper with the line showing the overall height of your doll. Cut off the paper at the ends so that the length of your paper is the height of the doll. Fold it in half and then in half again along the length of the paper so that the top of the line matches the bottom. Open out the paper and you will have four equal sections.

The top section = the top of the head to the armpits/a man's nipples

Section 2 = the armpits to the crotch (which is also where the wrists would sit of the arms are straight at your sides)

Section 3 = from the crotch to slightly below the knee

Bottom section = from slightly below the knee to the bottom of the foot

Mark these sections on your paper. I find it helpful to write on the lines 'armpit', 'crotch', 'knees' etc.

Body Width

The average male's chest is 2 head lengths across from shoulder to shoulder.

The average female's chest is 1 $\frac{3}{4}$ head lengths across from shoulder to shoulder.

Let's check me out again:

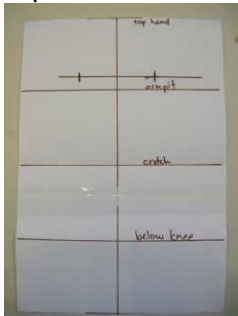


What do ya know! I am average in this case! I find that this rule tends to be more consistent, but that doesn't mean you can't bend the rules if you want to. Want a huge muscle man? Make him $2\frac{1}{2}$ heads wide. Want a caricature with an enormous head? Make it 1 head wide. Once you know the rules you can break them.

Example:

For my little elf with the 3" head, I want him to appear cartoonish and cute so I am only going to make him 1 head length wide. Therefore his shoulders will be 3" wide.

Step 3: draw a line slightly above the 'armpit' line to indicate where the shoulders would be. I find it helpful to place the head on the line with the top of the head resting on the top of the edge of the paper. This will help you to gauge where the shoulders should rest. Now draw a horizontal line, crossing your height line that is equal to the shoulder width you decided on (in my example 3").



A note about wire

I find the easiest type of wire to use is aluminium. I've used old coat hangers and stainless steel wire, and it works, but it is much harder to manipulate. Aluminium is strong but flexible. What gauge you use depends on how large your figure is. For my example I am using 3mm.

Wiring the figure

Step 4. Take a length of wire (how long this is depends on the height of your figure). Bend it in half. Stick the bent end in the neck of your dolls head so it is firmly placed (if the figure is clay it would have to have been sculpted on this wire in the first place).

Step 5: Take two more lengths of wire for the arms (how long this is depends on the height of your figure and how far you cloth/clay arm extends, that is does it stop at the wrist or go right up to the elbow?). Wrap the pipe cleaner or chenille stem for each hand around the end of each wire length. You may want to secure it with duct tape, surgical tape or floral tape – I have used all of these successfully.



Step 6: Take two more wire lengths for legs (how long this is depends on the height of your figure). If you are using pre-made legs (works best for bare feet) I would bend back the ends of the wire (so it doesn't poke through the fabric), insert it into the foot, bend at the heel and extend up the leg and beyond, then stuff around the wire.

If you are going to build up the leg and foot by wrapping (works best for shoes) then bend back the ends of the wire. This bent end would be almost at the end of the toes then bend where the heel would be and extend the wire up.

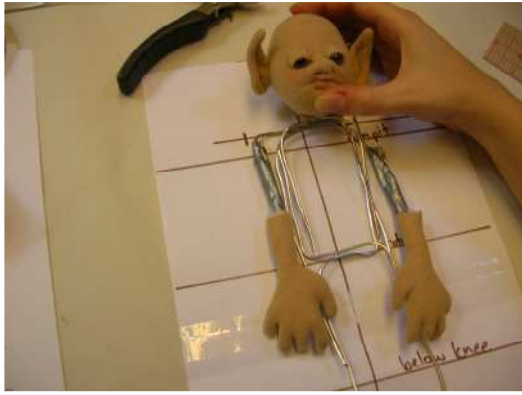
To determine where to bend the wire at the heel, the average shoe length is slightly longer than the length of the head. Of course if you are doing a short character with a larger head (as in my example) you may want to make the shoe smaller to better match the legs. As with all the other 'rules' you can break them to get the look you are after.

Step 7: Take all the body pieces and lay them out on your piece of paper, with the top of the head at the top of the page, the feet or foot wires with the heel bend resting at the bottom and the hands resting with the wrists resting on the crotch line.

Step 8: Bend the arm wires at the shoulder line, slightly inside the shoulder width line you have drawn (when you wrap the figure it will take the width out to that line) then cross the wire to other side of the body and bend it down the opposite side of the body so it sits inside the body, well within the shoulder width.

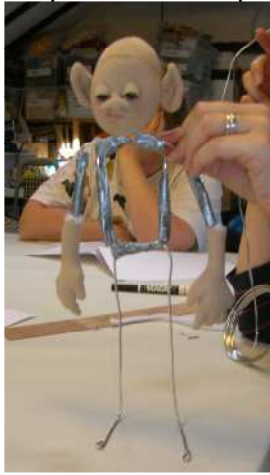
Step 9: Bend the leg wires at the crotch line, cross the wire to the other side of the body and bend up so that it meets the arm wire, well within the shoulder width.

With both legs and arms done they form a rectangle, forming the torso.



Step 10: Bend both sides of the neck wire out 90° to the neck and then down 90° again so that the ends of the wire rest along the sides of your torso rectangle.

Step 11: Duct tape all the wires together into the rectangle shape.



Step 12: Take a U shaped piece of wire. Make the U the width of the shoulders, and long enough to sit at the shoulders with an ends coming down to the ankles. Tape this wire in place at the ankles and along the rectangle. This wire secures and steadies the whole armature.

Step 13: Use jewellery wire (26 gauge for example) and wrap all the taped areas.

Optional Step 14: Duct tape something heavy into the body cavity (the rectangle) like a clean rock. And/or you could add weights such as fishing weights to the feet and duct tape them on to balance the figure.

Step 15: Fill the body cavity with fibre fill.



Step 16: Cut strips of batting/wadding and begin to wrap around the wires. Build up the body so that you have the figure you want, svelte, fat etc. You will need a needle and thread ready to tack the batting/wadding in place.

If you want to pad out certain areas then you can sneak bits of stuffing under the strips of batting/wadding, for example to form a bum or boobs.



Step 17: When you are happy with the shape then tack down the batting/wadding with needle and thread.

Optional Step 18: You can cover the body in a 'skin'. Old t-shirts work well for this. Create a pattern by draping paper towels over the body and tracing out the body parts. This step is not at all necessary. You can dress the doll right on top of the batting/wadding.

Step 19: Pose your figure, being careful to balance it so that it stands freely. Strike some poses in front of a full length mirror to get the right bends in the wire. You can repose wire armatures but don't do it too much as eventually the wire will weaken.

This method was adapted from the wonderful book by Maureen Carlson Family and Friends in Polymer Clay. Obviously, this book is intended for clay artists and I have adapted her technique for cloth, but this book is invaluable to me. It also wonderfully illustrates what happens when you play with proportion for bodies and heads. This method is also illustrated very well (although just for use with polymer clay, so you may want to take my suggestions as above for altering Maureen's method)

In these photos I have used Shelley Hawkey's pattern for Dylan the Elf from the December 2006 issue of Doll Crafter and Costuming.

Other resources

There is also a great article from the March/February issue of Soft Dolls and Animals by Penny Mason which gives a slightly different approach to this method. Back issues can sometimes be purchased on E-bay.

Other methods of doing wire armatures

Patti Culea's Roxanne Goes Solo pattern gives one method of creating a pattern for the body pieces, inserting the wire and stuffing around it.

Mimi Winer also has a free online article for this method at:

<http://www.mimidolls.com/DCC-Techniques/Index.htm>

Jack Johnston's polymer clay book called Art Dolls: Basic Sculpting and Beyond uses a method where the wire is inserted into a generic body stocking and then needle sculpted. I have tried this method and found it effective, but it is not my preference.

Susanna Oroyan's book Anatomy of a Doll is an essential doll making book which gives several wire armature variations. A classic from a recently and very sadly departed master of the doll world.