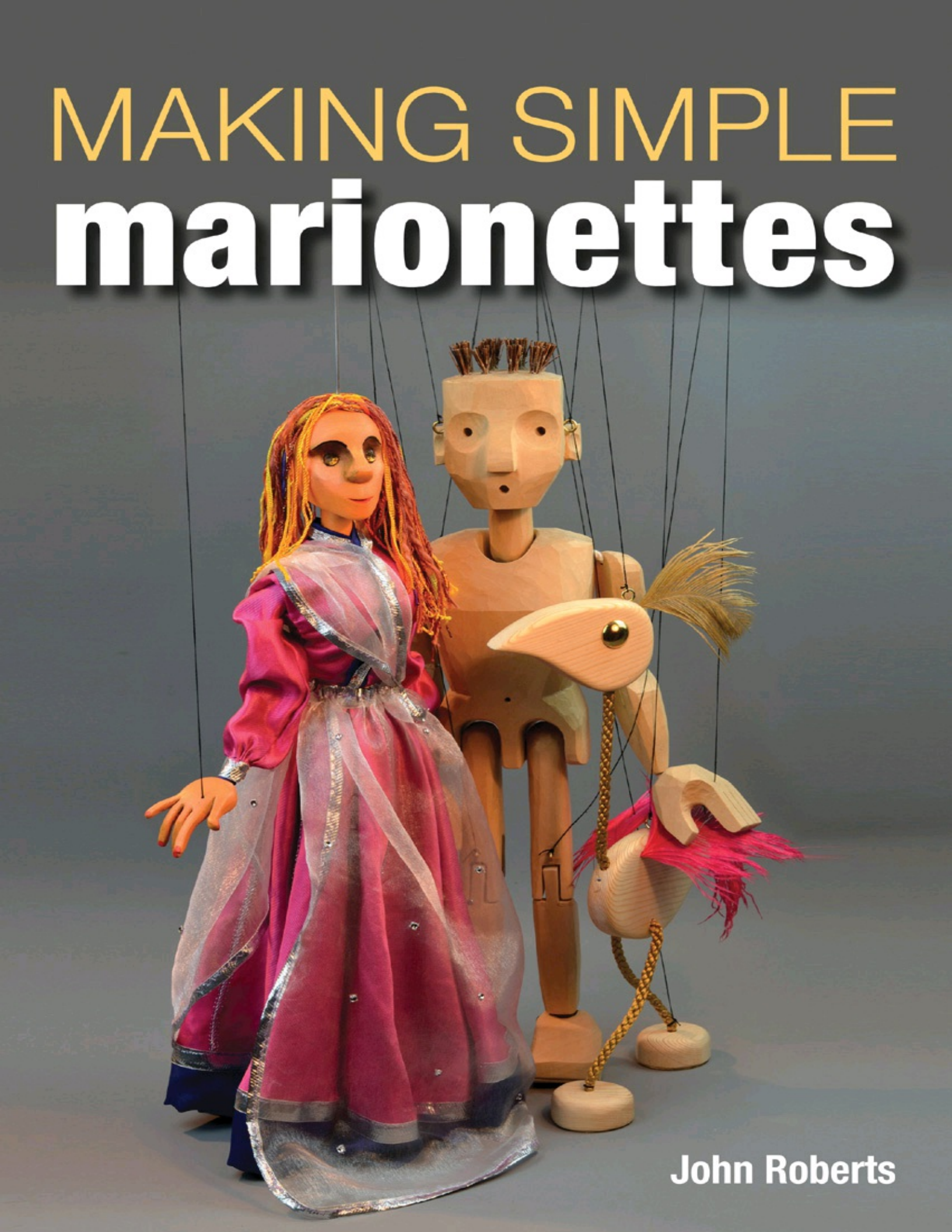
MAKING SIMPLE marionettes



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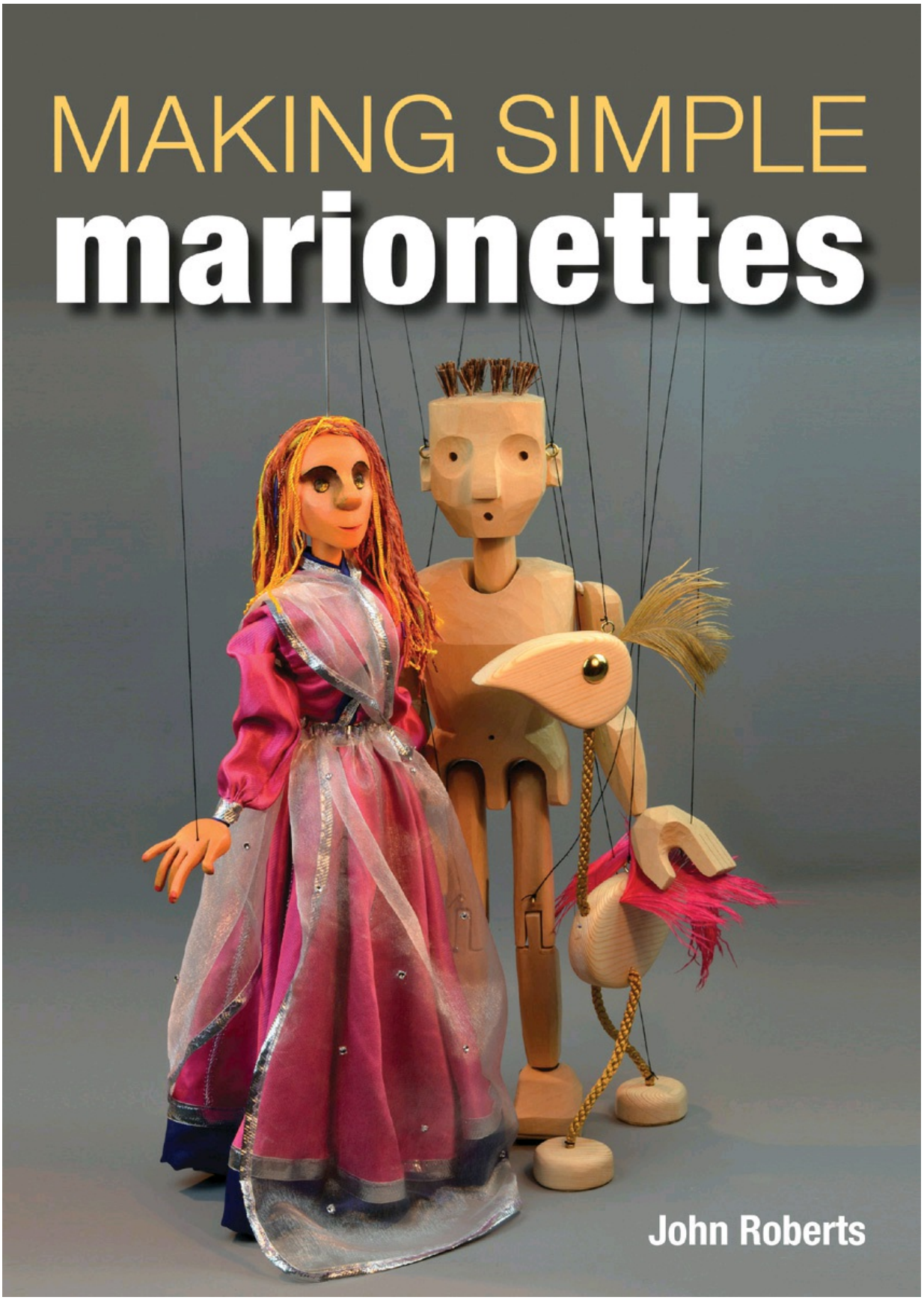
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INTRODUCTION

Scope of this book

This book is an introduction to making simple marionettes.

My aim is to guide the reader through making three very different marionettes, and along the way learn a bit about the background of this special form of puppet.

Much of the book consists of step by step projects, each designed to use different tools and materials, starting with very simple and fast methods, working through slightly more complex techniques, and ending with the most challenging of the projects. The resulting puppets also have differences in how they can be used, who they can be used by, and for what ‘audience’.

Guidance is given on level of ability needed to complete each project, what tools and materials are needed, and how long they will take to make. All of the projects use simple hand tools and should be achievable with a moderate ability at making things.

There is an overview of different styles of puppet, with examples from around the world, to illustrate the vast range possible, and show how there are many common elements in how they are designed, made and performed.

My hope is that you will enjoy making the puppets detailed in the projects, and will use them to perform for someone, to see their happiness and amazement when you bring your creations to life.

I hope too that you will be inspired to make more puppets of your own design, see puppet shows, and find out more about this amazing art/craft form.

Awooden puppet head on the workbench.

How I got interested in marionettes

I was very young, around five or six, when I was given a lovely set of glove puppets, made by my brother and costumed by our mother, along with a simple little puppet stage. I made my own glove puppets and made numerous alterations to the stage, adding a proscenium arch, curtains,

scenery and lighting. I used these glove puppets in their stage to put on little shows for friends and family.

The first puppet I was given – a glove puppet with a papier mâché head, that although a bit chipped, has survived more than sixty years.

About the same time I was taken to see a puppet show that captivated me. I remember it as a magical production with music, voice, scenery and

the most beautiful string puppets of medieval peasants and sheep. From then on my obsession was learning how to make marionettes.

Growing up in South Africa, there were very few opportunities to see professional puppet shows so I relied on books, some of which were terrible, a few were OK, and there was one little book that was inspirational: *Your Puppetry* by John Wright. I was given this book on my twelfth birthday and it set my future direction. The book starts with these words: *This book is intended for those who propose to take their puppetry seriously*… and it referred to puppetry as an 'art'. Reading this book was like having a great teacher standing next to me telling me how to make an excellent marionette. I only discovered decades later that the show with peasants and sheep, that so fascinated me, was by the author of the book.

Your Puppetry **by john Wright: the book that influenced me more than any other, published in 1951, the year I was born**.

My early attempt at a marionette show of *Hansel and Gretel*, with the help of my sister and mother.

I carved wooden marionettes, built a large stage and coerced my parents and sister to help make puppet costumes, write a script, record music and voices and then learn how to operate the puppets.

All through my school years and even through my architectural studies at university, my interest in puppetry continued. In 1980, roughly twenty-five years after I saw that first enchanting show, I was invited to join The Little Angel Puppet Theatre, in London, as a director. This theatre was founded by John Wright, the very person whose work originally sparked my interest.

During my ten years at The Little Angel Theatre, I toured with the

company around the world to puppet festivals, performing and seeing some of the best shows of the time. I even operated puppets from the show that I first saw, called *Mac the Sheep Stealer*.

Mac the Sheep Stealer **by john Wright's Marionettes, that started my passion for marionettes in 1957**.

Origins and uses of puppets

Probably the earliest puppets were made by prehistoric cave dwellers at night, using the light from a fire to cast shadows of their hands, twigs or bones onto cave walls. There is no evidence for this, but there are accounts of puppets dating to ancient times, with many world cultures having records going back thousands of years.

There is a human fascination with making inanimate objects come ‘alive’ such as playing with dolls or toy cars, or pretending a hairbrush can talk. People see faces in door-handles, burnt toast, and so on. Puppetry taps into this fascination.

Puppets have a long and varied history with many cultures using them for religious rites, morality plays, education and as satire, political comment or pure entertainment.

Sometimes puppetry is part of the mainstream of theatre, but often it has been more on the edge of cultural events. For example, in Britain in the seventeenth century, when human theatres were closed, puppets continued to perform.

Some puppetry performed today continues long traditions passed down the generations, while other puppetry is ground-breaking, inventing new ways to use this ancient art.

Characteristics of different puppets

Here is a short overview of how marionettes fit within the larger world of puppetry.

There are four main forms of puppet, each with its unique qualities.

Hand puppets

This category has a number of variations:

Finger puppet

This simplest of types is often a child’s first puppet. These fit onto fingers, or fingers are poked through holes to become the legs of the puppet.

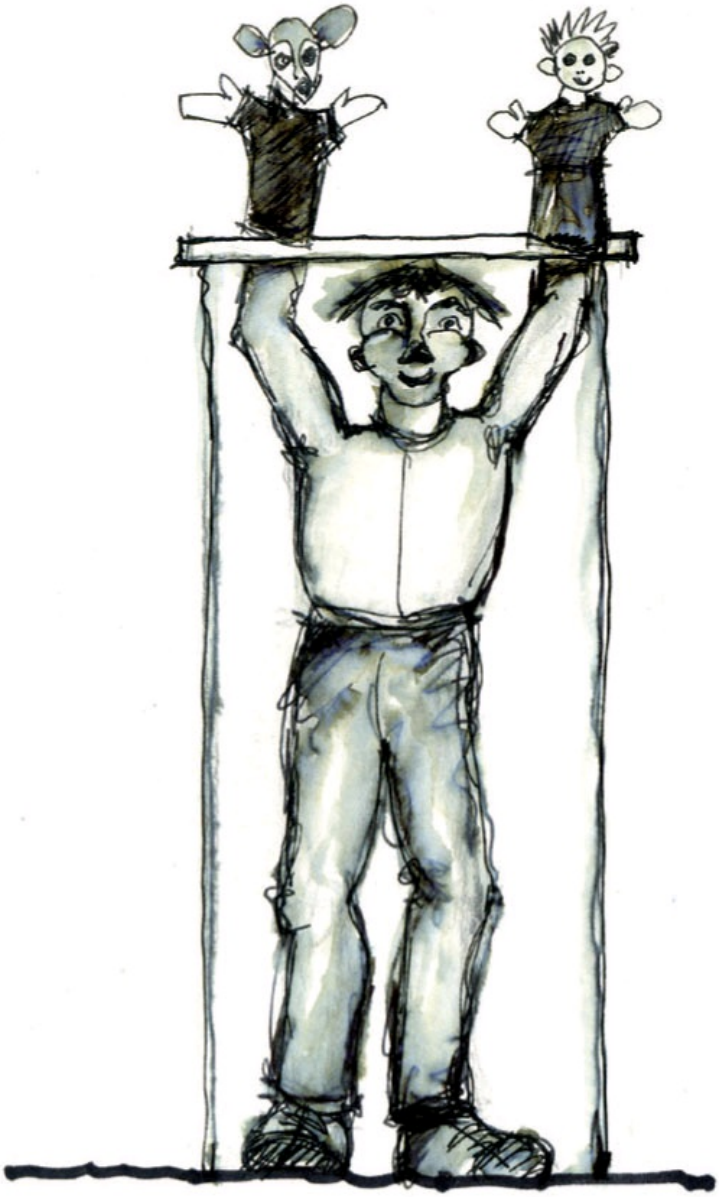
A crowd of finger puppets can fit on just one hand.

Fingers become legs for this paper octopus puppet.

Glove puppet

Another puppet type that is frequently used as a toy.

They can be easy to make, needing just a head and some fabric for the body of the puppet, which is worn on the performer's hand like a glove. Making the puppet move is instinctive.



A sketch of a glove puppet 'booth' without its fabric cover, showing how the puppeteer performs the puppets above his head.

This simplicity has contributed to the wide distribution of this puppet type over time and around the world. Another advantage is that one person can perform two puppets at the same time, with a puppet on each hand. The puppets are commonly performed above the puppeteer's head in a little stage called a 'puppet booth'. This makes for a most economic and portable form of puppet theatre.

Glove puppets can pick up objects easily unlike most other puppet types

and they can move fast, lending them to slapstick comedy. They are not as elegant as other puppets, having limited arm movements, and usually no legs. Some glove puppets, especially traditional ones from China, can be extraordinary, able to do somersaults, be beautiful and poignant, as well as comic.

An exquisite Chinese glove puppet with legs, a fan, moving fingers and even a hat that rotates. Performed by puppet master Yang Feng, a fifth generation puppeteer.

A modern-day Mr Punch with large head and small hands, carved in wood. Based on Piccini's famous puppet of around 1800.

In Britain the most famous traditional puppet is Mr Punch, who started life as a marionette imported from Europe, coming from the *commedia dell'arte* character Pulcinella, with the first recorded performance in London in 1662. Punch became a glove puppet performed by a sole performer, sometime in the eighteenth century. This transformation from marionette to glove puppet changed Pulcinella's personality from a comedic, graceful marionette to the anarchic, violent, slapstick puppet that is Mr Punch.

A sock plus two 'eyes' on elastic, and some 'hair', makes a talking hand-in-head puppet.

Hand-in-head puppet

Sock puppets and *The Muppets* are examples of hand-in-head puppets, with the puppeteer's hand fitting inside the mouth of the puppet, allowing the puppet to 'lip sync' (lip synchronize) to spoken or sung words.

Bare hand puppet

Here the glove of the ‘glove puppet’ is absent, leaving the bare hand exposed. First pioneered in the 1930s by Russian puppet master Sergey Obraztsov.

A wooden ball with simple eyes and a nose on a bare hand can be surprisingly expressive.

Rod puppets

Any puppet controlled by sticks from below or behind the puppet is called a rod puppet.

The puppeteer may be out of view, hiding behind a screen, with the puppet performing on a 'play-board' or narrow stage above the puppeteer's head.

Large rod puppets with rods to head and hands, worked from below. ***The Bewitched Baobab Tree*** **by PuppetCraft**.

A sketch of three performers working together to animate a Bunraku puppet. The master-puppeteer stands on clogs and has his face showing. The other puppeteers have their faces covered with hoods.

Alternatively, the puppet operator may be visible standing behind the puppet, working rods coming from the back of the puppet. This form comes from a Japanese tradition called Bunraku, after the man who came up with the idea. In a *Bunraku* show each puppet is worked by three skilled puppeteers.

Bunraku technique has been modified in modern times to be used for

large and small puppets, performed by one person or by a team. If performed at table height these puppets are commonly referred to as ‘table-top’ puppets.

Rod puppets are usually bigger than glove puppets, so they can perform for larger crowds. They can have legs unlike most glove puppets, and are able to perform a wider range of movements, with longer arms, and can be given very subtle movement by the puppeteers.

A table-top puppet by PuppetCraft.

Vietnamese water puppets are a very unusual form of rod puppet. The technique started as a folk art made and performed by farmers in rivers. Brightly painted wooden puppets are fixed to long bamboo poles that are submerged just below the surface of muddy water. Puppeteers stand chest deep in the water, hidden behind a screen. The puppets emerge from the water, without any visible means. Simple puppet movements are controlled by the bamboo poles and cords that articulate arms, or make the puppets spin. The performances are enhanced with music, singing and fireworks!

Brightly coloured Vietnamese water puppets are reflected in the water from which they rise.

Shadow puppets

The audience watches shadows cast by puppets onto a screen. The puppet may be two-dimensional or 3D, translucent, transparent, coloured or black. The light shining on the puppet can be the sun, a candle or an electric light. Any material can be used to make shadows, including paper, cardboard and found objects, or shadows can be made using just your

hands. Shadow puppetry uses deceptively simple techniques to transform a scruffy bit of cardboard, a feather, a hand or a complicated design, into a magical on-screen creation.

Asian traditional shadow puppets have been made for centuries from leather, cut into intricate patterns, and coloured with inks or paints. If the leather is very thin the colour can be seen as beautiful tints through a thin white fabric screen. Thicker leather will cast a solid black shadow.

Indonesian wayang kulit uses hundreds of finely cut and coloured shadow puppets to tell stories from the Hindu epics *Ramayana* and *Mahabharata*, accompanied by a large orchestra called a gamelan.

Simple shadow puppets cut from black cardboard, seen behind a drum-skin which is used as a screen.

A delicate Chinese shadow puppet cut from translucent leather which is coloured with inks, that produce a softly coloured shadow.

A *wayang kulit* puppet cut from thick leather and intricately painted. The colours can only be seen when watching the show from behind the screen.

Marionettes

A marionette is a puppet controlled from above. It can be worked by strings (often called a string puppet) or by rods.

For many the archetypal image of a puppet is *Pinocchio*, the famous string puppet boy, whose nose grows when he lies. He is from the Italian

children's novel written in 1883 by Carlo Collodi, which was turned into the famous animated film by Walt Disney.

A drawing of *Pinocchio* used as the logo for a shop selling puppets in Australia.

It is thought that the word 'marionette' derives from the Middle Ages when little figures of the Virgin Mary, or 'small Madonna' were made to move using strings.

There is a distance between the marionette and puppeteer, giving a

feeling that the puppet is moving of its own accord. This effect is strongest when the human operator is not visible, but even when the operator can be seen, the only connection is the strings, and the longer these are, the greater the effect of independent movement will be. If properly lit, against the right colour of background, the strings of a marionette can be completely invisible.

The marionette is one of few three-dimensional puppets that one puppeteer can fully articulate on their own, moving legs, arms, body and head. The puppet can do a full 360-degree spin, as there are no rods sticking out of the back of the puppet, and can fly and float without visible support. This freedom of movement is unique to the marionette.

The Little Angel Theatre's production of *Philemon and Baucis* by Haydn. Strings from the operator's 'hat' and over his shoulders control the puppet's head and body.

Simple marionettes are often made as toys, while the most complex ones take years to learn to control. The marionette is considered by many to be the most difficult of the puppet forms to master, in both making and performing.

There are references to marionettes in ancient writings and illustrations from many countries, including Egypt, India, China, North America, Greece, Italy and Britain. Marionettes have performed ritualistic ceremonies,

dramas, folk tales, variety acts and operas. There is a long tradition of marionette shows used as miniature versions of human theatre, capitalizing on the universal fascination of seeing small creatures moving ‘on their own’. These productions can achieve the lavish scenery and lighting of human theatres, at a fraction of the cost. Special effects, like flying and being cut into pieces are simple to achieve on the marionette stage, as is having animal puppets performing alongside human characters.

Monkey King **from the foremost marionette makers and performers in China, The Quanzhou**

So popular were marionette musicals, that Joseph Haydn, the great classical composer, wrote five operas for marionettes, for performances at Esterházy Palace, Hungary, during the 1770s and 1780s.

In China, puppet operas tell epic tales of the character *Monkey*, blending folk tales, history and religion. These puppets are the most complex of any traditional string puppet, with up to thirty-six strings on a single character. The puppeteers have a seven-year apprenticeship to learn to bring these most challenging puppets to life, singing as their voices, while manipulating the handfuls of strings. This is a form of puppetry that has a 3,000 year history. It has even influenced the human opera, with the movements of the puppets being mimicked by their human counterparts.

A Victorian juggler marionette.

Another popular type of puppet, that still endures, is the ‘trick’ marionette. Widespread across Europe and Britain from the 1770s on, they became a firm favourite with audiences. Puppets are able to perform the impossible: necks elongate; limbs fly off and then re-assemble; a large puppet breaks apart to become a crowd of smaller puppets; a juggler performs gravity defying tricks. This tradition lives on today in the performances of cabaret acts and buskers.

A scene from *Thunderbirds* showing puppet characters Scott, Lady Penelope and Virgil.

The puppet of John Cusack dressed in monk's robes from *Being John Malkovich*.

Nowadays marionettes are not as widely seen as in the past. This is a general trend with all types of puppet around the world, as the popularity of the puppet has been usurped first by books, as more people became literate, and then by TV and film.

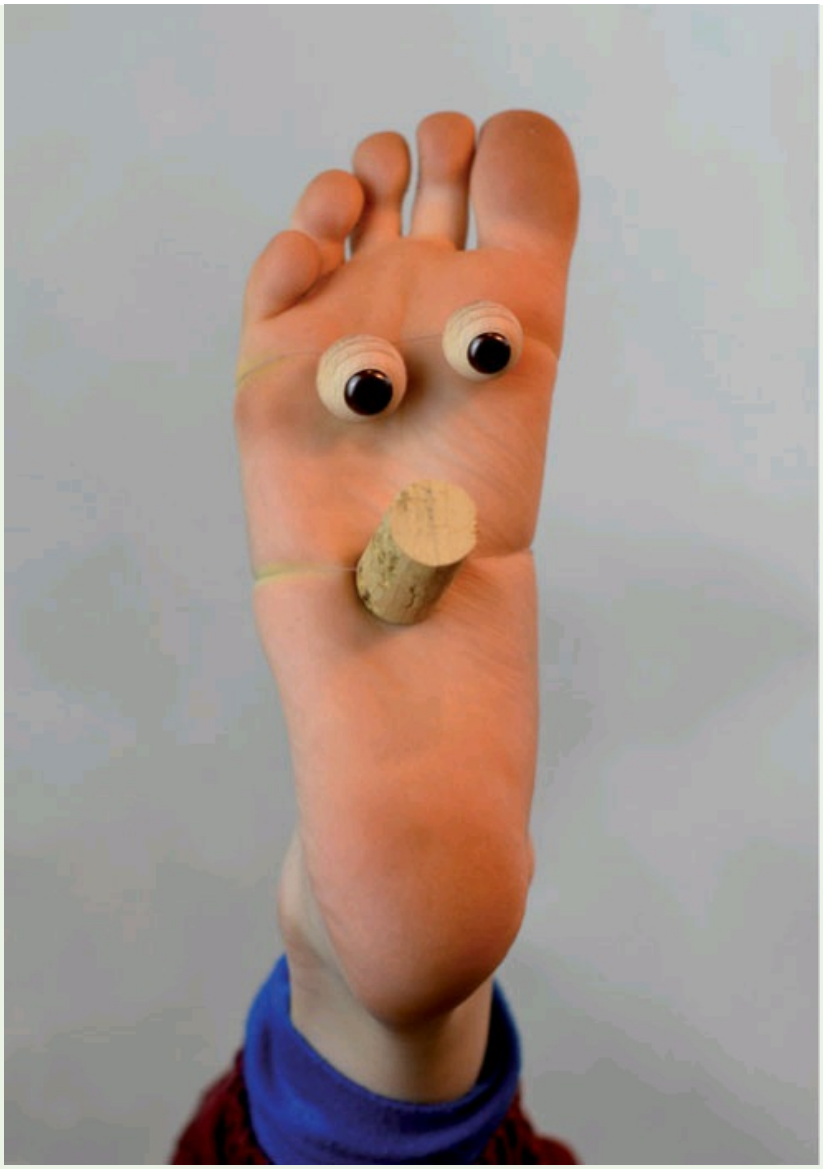
Marionettes have occasionally sneaked into these 'new' entertainments. *Thunderbirds* was a very popular British science fiction television series in the 1960s, using 'Supermarionation', which added moving eyes and lips using electronic controls.

The 1999 comic, fantasy movie *Being John Malkovich* used some exquisite marionettes of the actors to great effect.

Of all the types of puppets, the marionette has declined most, as it is a challenging puppet form to get right. It is particularly demanding to tour, often needing a lot of equipment and space. However, there is still a rich variety of traditional and new marionette performances in many countries around the world. Its rarity has made the marionette very special.

UNUSUAL PUPPETS

Some puppets do not fit neatly into the four main categories of puppet types. For example, there are puppets that use more than one technique; there are foot puppets and toy theatre can use any of the puppet types, but all in miniature.



A foot puppet is one of the more unusual puppet types.

Kneehigh's production of *The Tin Drum* uses a puppet as the central character, onstage with human actors.

THE FUTURE OF PUPPETS

Some forms of puppetry have died out or are nearly gone. However, the appeal of puppetry is evident in how puppets, big and small, have endured and are being used in novel ways. More and more human theatre is incorporating puppets, performing alongside actors as equals.

Puppetry is a rich and evolving craft, art and theatrical form, with endless possibilities.

CHAPTER ONE

FROM IDEA TO PERFORMANCE

Whether a marionette is simple or complicated, there are many aspects that are similar in their design, making and performing. Here is an overview of this process, with examples from amateur and professional puppeteers, showing some of the richness and variety possible.

Puppetcraft's production of *Monkey!*

When making a marionette there are lots of things to consider: who will do the making, what materials are available, who will perform the puppet, who will watch the performance, what the puppet will do, and what it is for – entertainment, education, therapy, and so on.

A mock-up from cardboard jointed with pins to test how a puppet will move.

Starting point

Every puppet starts with an idea. This might be a story, a particular material you want to use, or what you want the puppet for. Who will perform the puppet might be the starting point, as a child or an experienced professional puppeteer need different complexity of puppet.

Where the puppet will perform might be the starting point, with an intimate space able to have a tiny puppet, while a large street parade will need a bold design.

Most puppets start as a rough design

Small sketches are made of the puppet in different views, a maquette (a small model) or a mock-up is made from clay, scrunched paper, plasticine, kitchen foil or cardboard. By working at a small size, many different ideas can be tried out quickly.

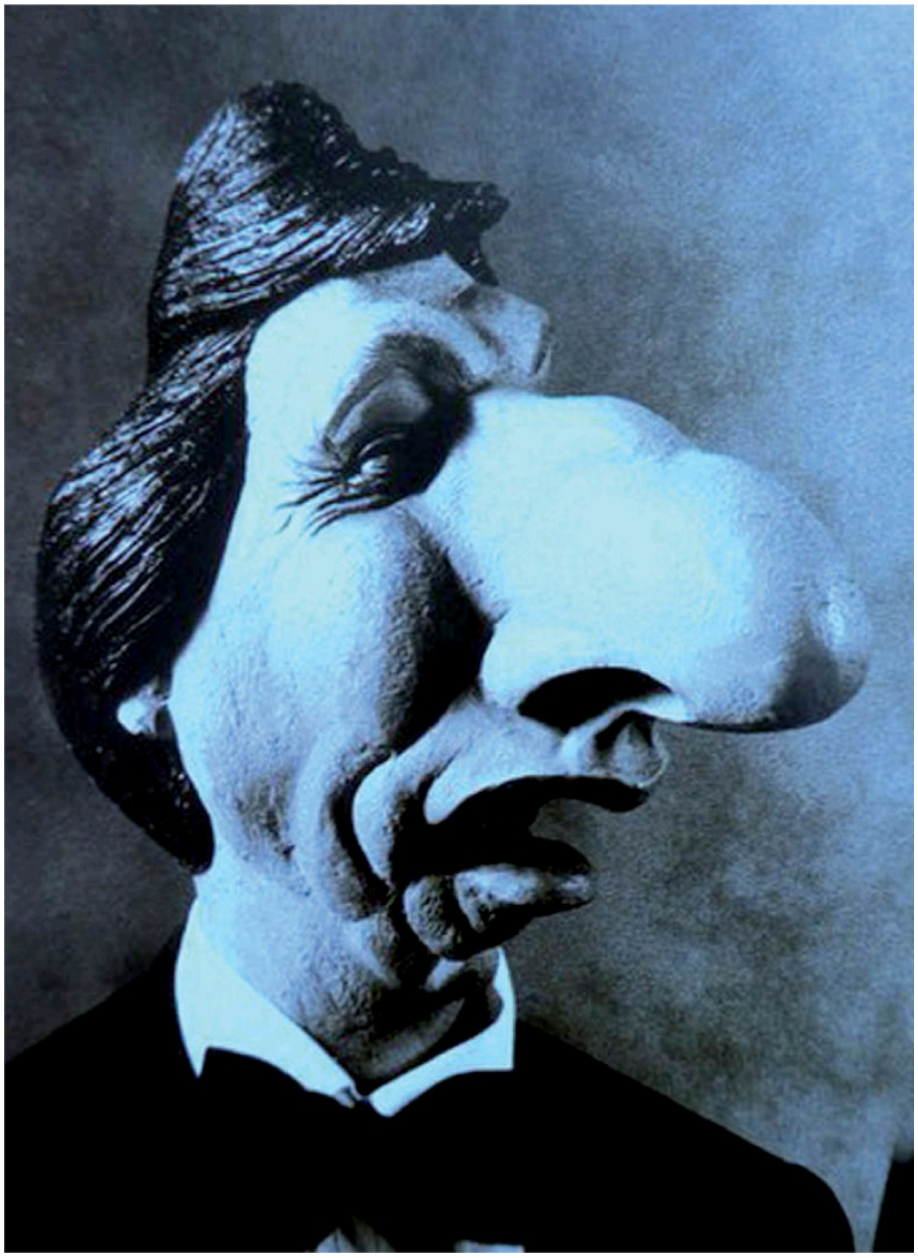
The style of your design may be naturalistic, caricatured or even abstract. Anything is possible with a puppet. There is a strange wonder about an ultra-realistic puppet looking
and moving like a miniature human or animal. Puppets often have exaggerated features, to make the puppet easily seen from a distance, as political satire, for comic or artistic reasons.

Even at this early stage you need to decide how the puppet will be viewed by an audience, for instance, for a puppet that is to entertain a few people who can get close to the puppet, there can be fine detail, while for a large audience bolder forms and colours will be needed.

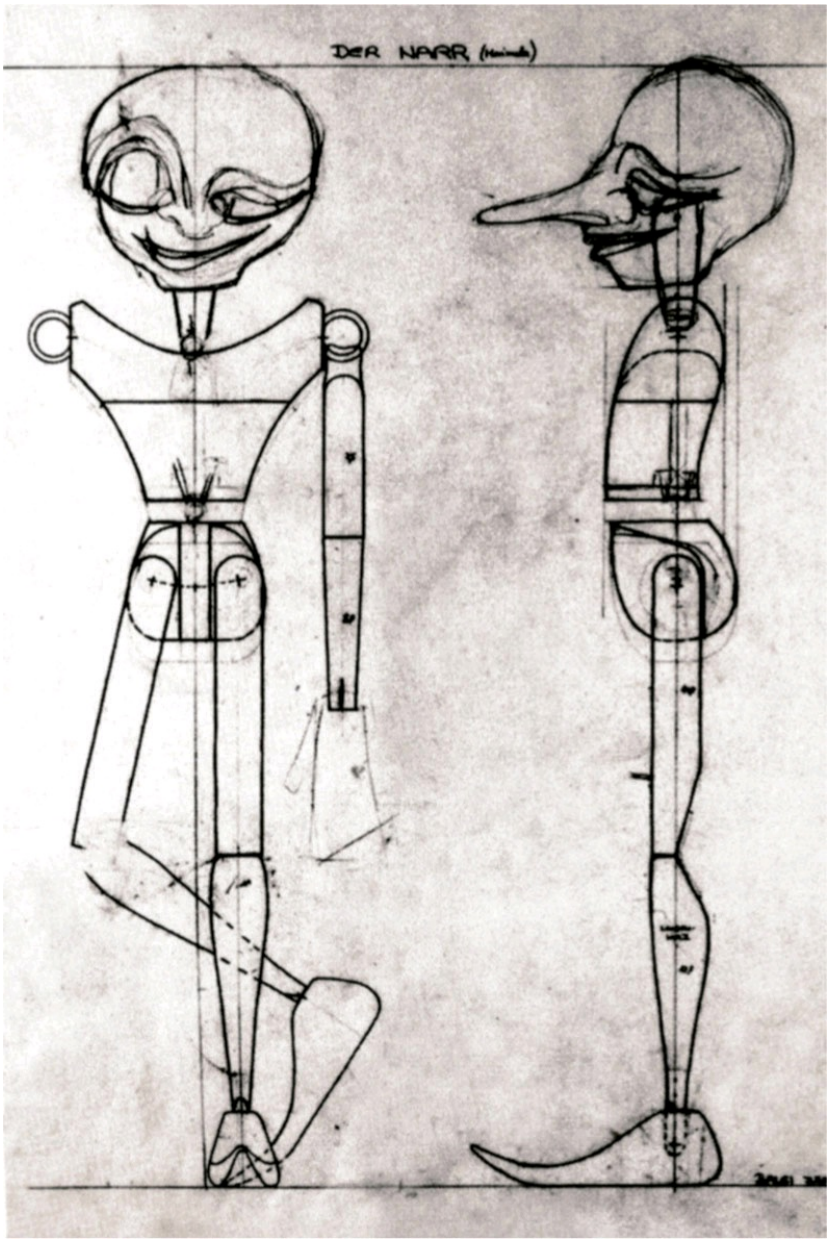
How the puppets will ‘talk’ will affect how they are designed, with some having moving mouths and changeable facial expressions. Others rely on the whole body of the puppet to express emotion.

Non-realistic marionettes of *The Roel Puppets*. The director Olive Blackham was interested in using puppetry as an art form in its own right, rather than making a miniature version of the human theatre.

A puppet, from the West End production of *Nice Fish*, made to be a miniature, realistic version of an actress.



Exaggerated features were used to portray actor and film star Dustin Hoffman for the TV show *Spitting Image*.

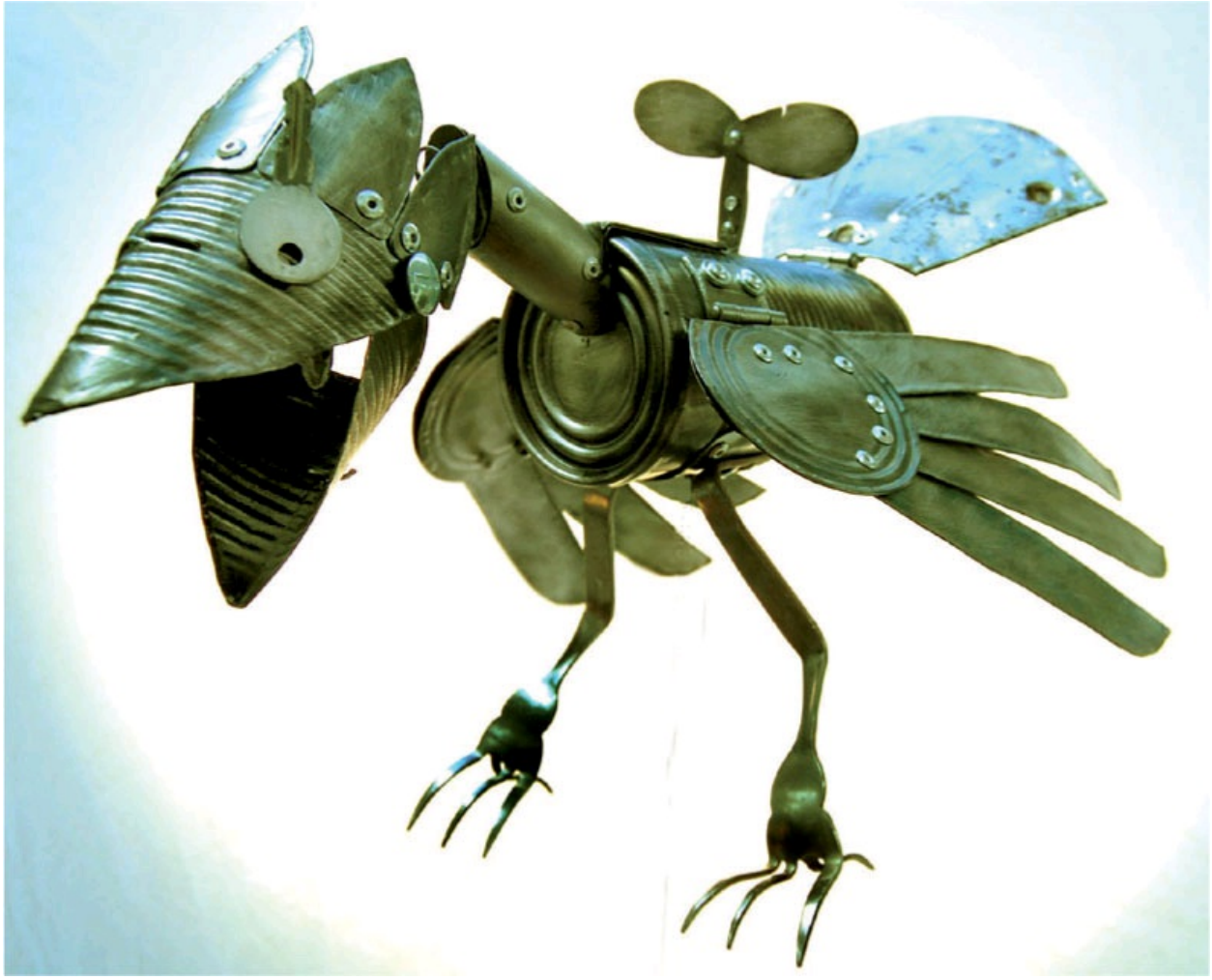


A design by *Düsseldorfer Marionetten-Theater*, for a puppet character with large head, as an artistic stylization.

A moving mouth on this puppet gives a comical, chattering movement.

Experimentation and play

Rather than designing the final puppet, you can try out various materials to see what they can do and what they can create. This often leads to unexpected results that can be very exciting. The method is driven by the material's movement, weight, sound and texture rather than a formal design. You may have a rough idea of what you want to create, but you need to be flexible enough to alter your idea as the making progresses.



A metal wind-up bird made by experimenting with discarded junk, to create a puppet for *The Tin Forest* by PuppetCraft.

Size and weight

The size and weight of a puppet are fundamental to how a puppet will move, so they need to be thought of from the start.

Size

It seems obvious that a large audience needs big puppets, so as to see them well, but this is not always the case. It is amazing how even fairly small puppets can be enjoyed from some distance if they are well

designed and wellstaged. Human eyes are wonderful at seeing detail. The size of a puppet will grow in the viewer's mind, especially if the puppeteer is not visible, so there is no way of comparing how big or small the puppet is. A common comment after a show, when the audience see the puppets up close is 'they are so much smaller than I thought!'

Slow big movements of the large giant contrast with the fast movements of the small child puppets. PuppetCraft's production of *The Selfish Giant*.

The puppet's size has a major effect on how it will move, with small light-weight puppets moving fast, while large puppets have a slow movement. A marionette's limbs act as pendulums – with long limbs swinging slowly, short limbs swinging fast.

Small puppets

There are many advantages of going small: the stage can be small too;

transporting the puppets and sets is easier; small venues can accommodate the stage size. But there are disadvantages too. Audience numbers need to be limited, making can be difficult and the puppets can be very fragile.

Large puppets

Can be good when there is a big audience, a large space to fill and when a bold impact needs to be made. Disadvantages are the high costs to make, they are difficult to operate, transport and store. The large space needed to perform will limit where the puppets can go.

An ideal size for a marionette of a human ranges from about 30cm to 70cm. Smaller puppets do not have enough weight to control easily. Larger puppets become ungainly in movement and are very tiring to perform.

The Salzburg Marionettes **started using very small puppets, but increased the size to get better movement and to be seen well by larger audiences**.

Weight

Marionettes have only two forces acting on them to get them to move: the downward force of gravity, and an upward pull from strings. So the weighting of the whole marionette, as well as its separate parts, is important to achieve the right articulation. Rod marionettes have additional forces of push and twist acting through the rod.

A heavy puppet will be ground-based and slow moving. A light puppet will be difficult to hold still, possibly being blown around, but can be made to move fast, float easily and is less of a strain on the puppeteer's arms.

A marionette is usually held by one person with outstretched arms, so it is important to keep the puppet as light-weight as possible, but with enough mass to control it well.

EXCEPTIONS TO THE RULES

Marionettes from Sicily (*Opera dei Pupi*) are the heaviest and tallest of any traditional marionette, weighing up to 30kg. Dressed in embossed metal armour, they are up to 1.3m tall and are controlled by a thick metal rod to the puppet's head, a thinner rod to the puppet's sword hand, and a string to the other hand. The movements are bold, made for great crashing battle scenes.

A rod-marionette from Sicily, made from wood, with metal armour.

French company Royal De Luxe is the best example of breaking all the rules for a marionette's size and weight. It has made wooden marionettes 15m tall that roam the streets, suspended from cranes, each animated by over thirty people.

Tiny bits of fabric can make wonderful little marionettes. The lightness and irregular movement of the fabric, which hangs below a small weighted head, is perfect to express playful running, jumping and dancing.

The Little Girl Giant by Royal de Luxe stands 5.5m tall and is operated by a team of puppeteers pulling on ropes.

Bits of silk fabric make the children for PuppetCraft's *Pied Piper*.

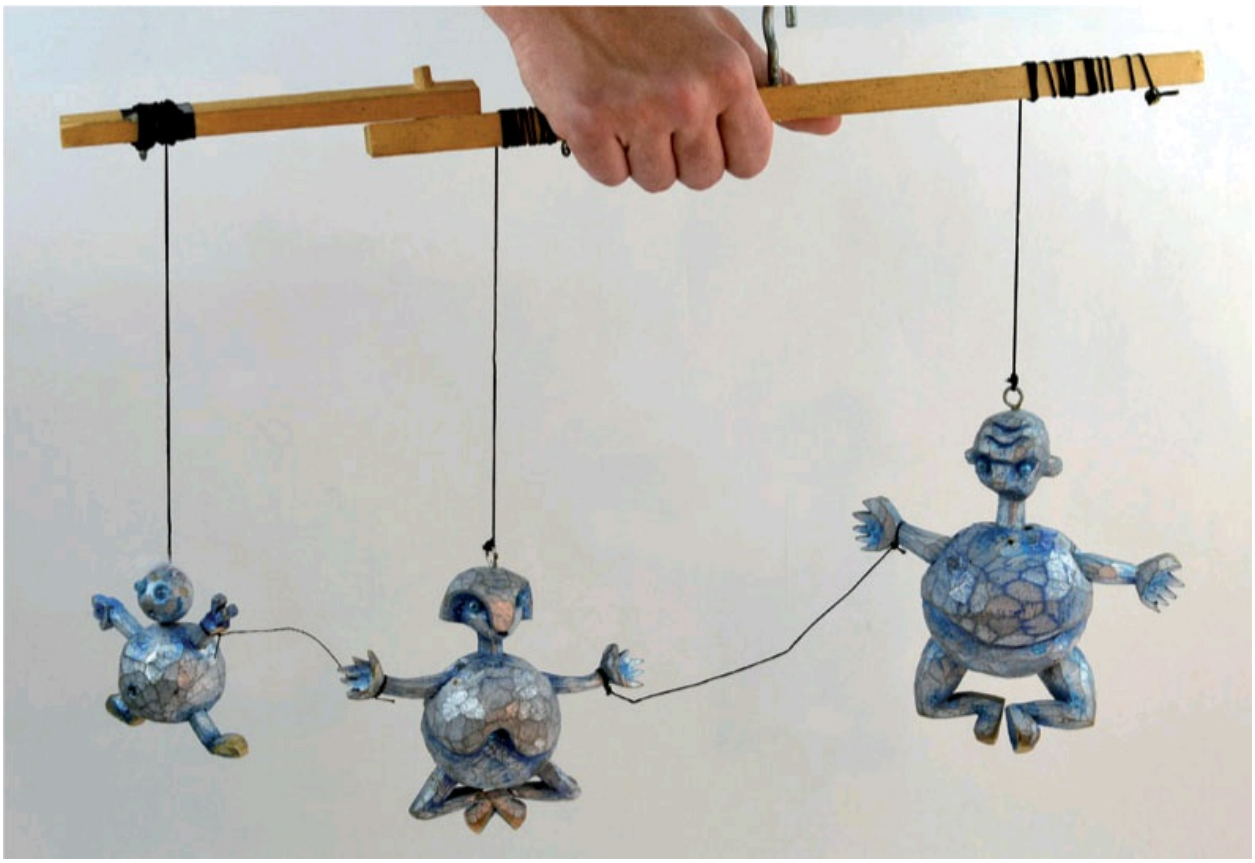
Pulling the strings

The marionette only comes to life when animated, or operated, by a puppeteer. If the puppet operator is young or unskilled, the puppet needs to be simple in design and construction to produce limited but good movements.

Skilled puppeteers can control a highly complex puppet, capable of performing a great range of movements. It is rather like musical instruments in an orchestra; a triangle can be played easily, while a violin takes years to master, but can create richer music.

A rod-marionette with only one control rod.

Chinese marionettes have up to thirty-six strings: they are the most complex of any traditional marionette.



Mother, father and baby Hail, from a show by PuppetCraft. all three puppets can be worked by one hand, as they are suspended on elastic from a single control.

Two puppeteers work together to perform a Chinese puppet.

By simplifying the controlling method, and limiting the range of movements, it is possible for a puppeteer to hold one puppet in each hand, or, by joining a group of puppets onto one large control, one operator can perform a whole group of puppets simultaneously.

Some complicated marionettes need two or more puppeteers to bring them fully to life.

Making the puppet

Marionettes can be made from anything, including cardboard, wood, plastic, glass, fabric and metal. The method selected to make a puppet will depend largely on what the puppet needs to do, who the maker is, how long-lasting the puppet needs to be, and how much time and budget there is.

Experience has shown that some materials work better than others.

Traditionally the most used method of making marionettes is by carving them from wood. Wood is most used as it is easily found throughout the world, is pleasant to use and makes finely shaped puppets that are strong enough to last for decades. To get movement, sections are joined together with anything flexible like string, leather and rope, or are pivoted together with nails.

***Monkey*, a carved wooden puppet by John Roberts**.

Plastic from milk bottles and packaging have been used to make a Harlequin puppet.

Other materials commonly used

- Plywood sheets: to make light-weight strong, simple forms.
- Synthetics: plastics, foam rubber, fibreglass, latex rubber. Some can be cast to make multiple versions of a puppet. Some are transparent/translucent. 3D printers are being used to make all the parts of a marionette. Some plastics can be cut, filed or folded to make puppets.

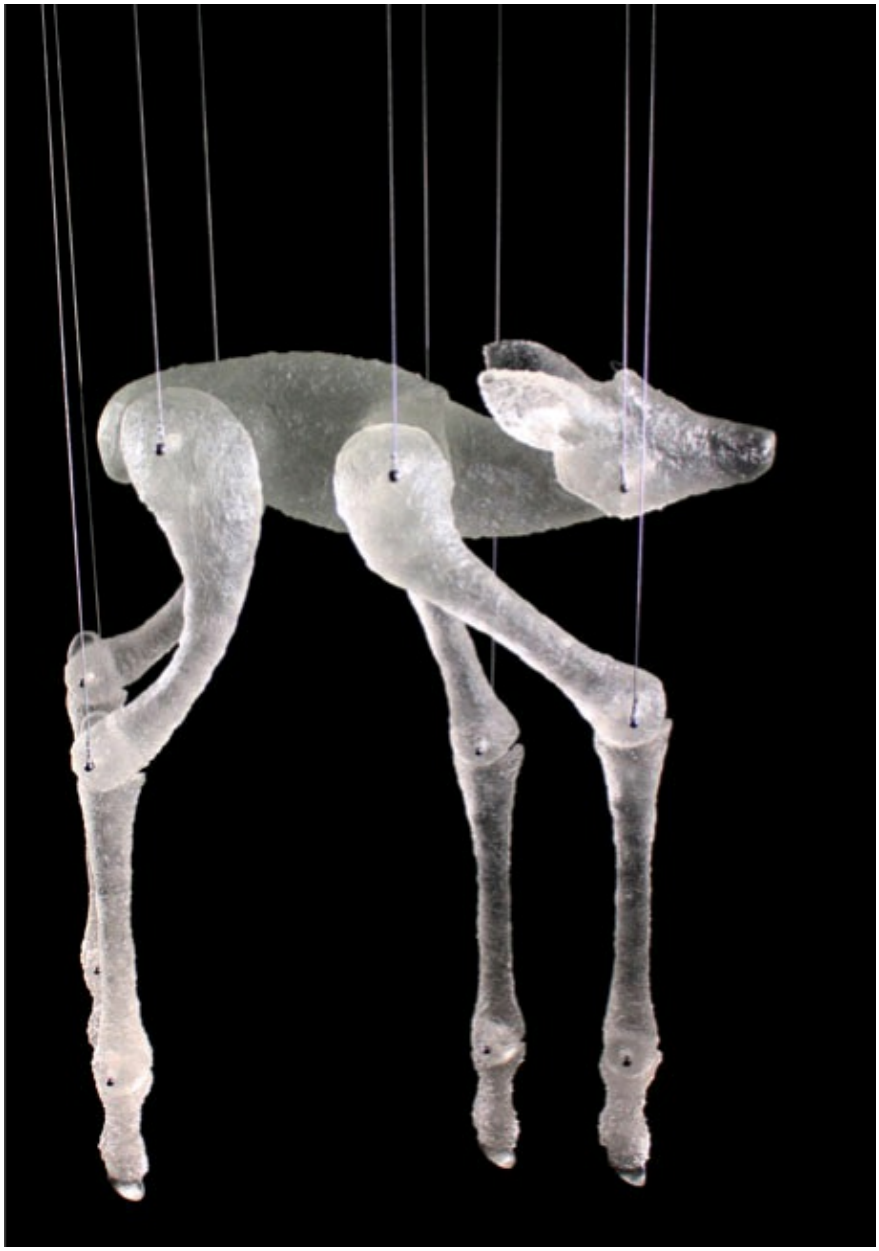
- Cardboard and paper puppets are fast to make and can be great fun, but will break up after a short amount of use unless well reinforced.
- Papier mâché is a versatile material that can be used for all parts of a marionette.
- Fabric puppets work well if properly weighted.
- Wire is good to make a thin, strong framework or skeleton, to take foam rubber or other padding … or to make a skeleton puppet!
- Willow frames covered in tissue paper or fabric can be used for large marionettes.

A fabric marionette by Nori Sawa. The accentuated stitching and the material's texture are strong aesthetic features.

Large light-weight structures made from willow frames covered in tissue paper make translucent puppets that can be illuminated from within.

Unusual materials can be interesting

Puppets have been made from glass or porcelain. They are very beautiful and make gentle sounds like chime bells, but they are extremely breakable and heavy.



A kiln-cast glass puppet, made for display in a gallery, by artist Caterina Urrata Weintraub.

A traditional Chinese marionette is a combination of wood, wire and fabric.

Marionettes can be made from fruit, vegetables and bread, but they will not last long, will rot, and mice will be a danger!

Each material produces different shapes, textures and movements. Often a combination of materials is used to utilize the nature of each material, for example, a structure of wood or wire is used as a strong core, and is then covered in soft, pliable fabric or rubber.

The marionette stage

Once the puppet has been made, painted, costumed and strung onto its control, it can be brought to life … on a stage! A marionette can perform in many places: on a specially built puppet stage, on a street corner, on an actor's stage, in a classroom, in a church, and so on.

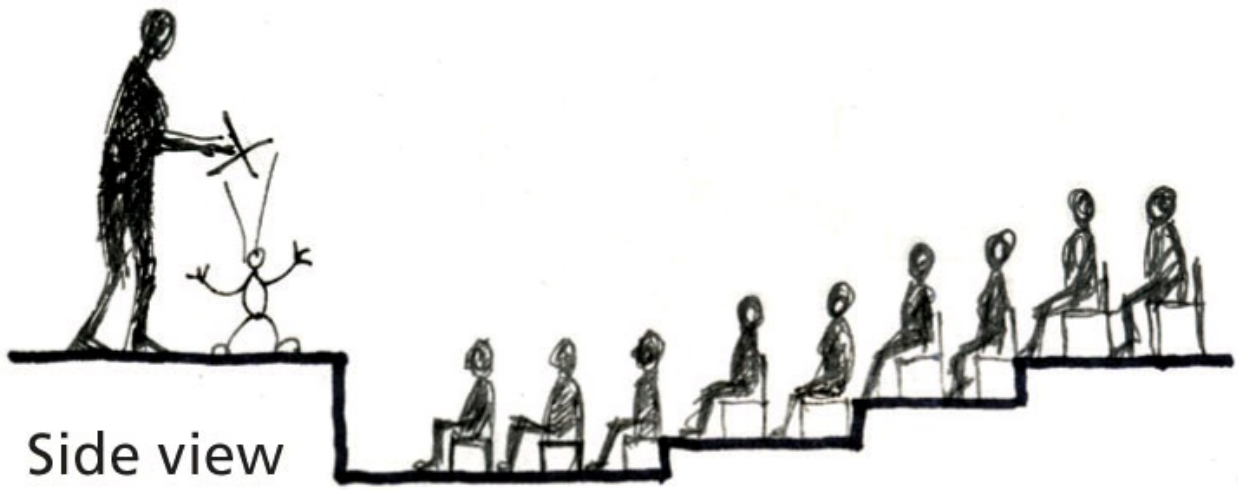
Each 'stage' has its own qualities:

- A purpose-made puppet stage can have scenery and lighting to enhance the look of the puppets and create atmosphere. The puppeteers may be invisible, masked by a curtain.
- A busker on a street corner has no control over lighting, external sounds, and performs with the puppeteer in full view.
- Cabaret-style will have a puppet moving about a full-size human stage with the puppeteer in view, or working from the shadows, with just the puppet spot-lit.

A common need for all types of stage is good sight-lines. Most puppets are smaller than humans, so it is essential that the whole of the puppet can be seen by all of the audience. A marionette usually performs at or below the puppeteer's foot level.

Side view

In the simplest arrangement, the puppeteer performs the puppet on the floor. The number of people who can see the puppet is limited. By arranging the audience to sit and stand, a simple 'raked' audience can see far better.

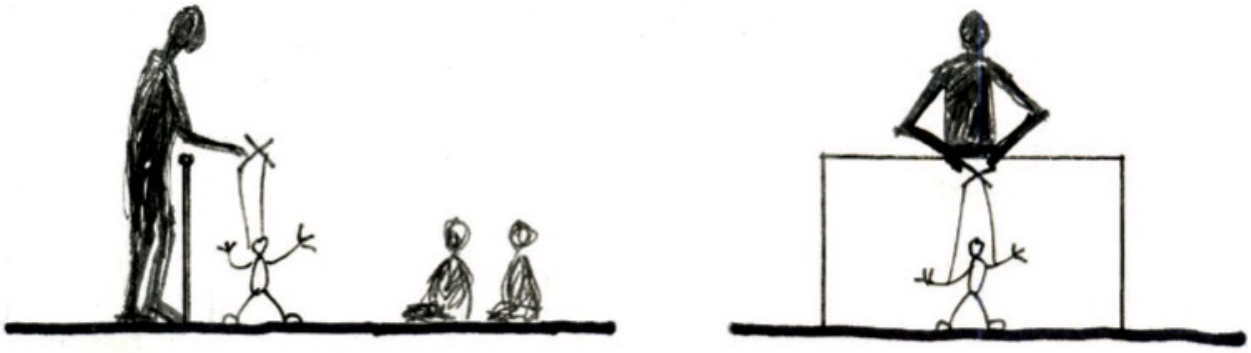


By raising the puppet onto a platform, a larger audience can see the puppet, and a raked auditorium allows even more people to see well.

Hiding the puppeteer

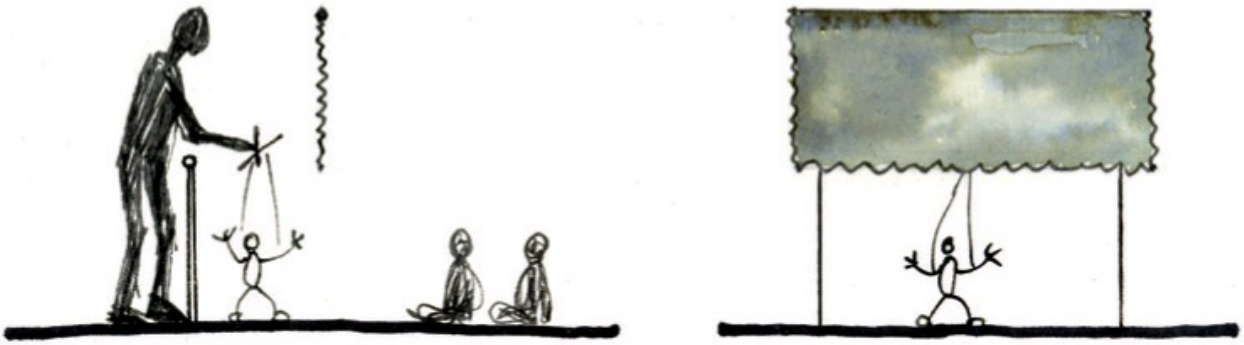
Sometimes it is interesting being able to see the puppeteer and the mechanics of how the puppet is worked. Some shows use the interaction between puppet and operator as part of the performance. In an informal setting, like a classroom, home or street, this ‘exposed puppeteer’ is the most practical way of performing. It also gives the greatest freedom to where the puppet can move.

Sometimes it is better to hide the puppeteer so as to concentrate the audience’s focus on the puppet without seeing the human above.



Side view Audience view

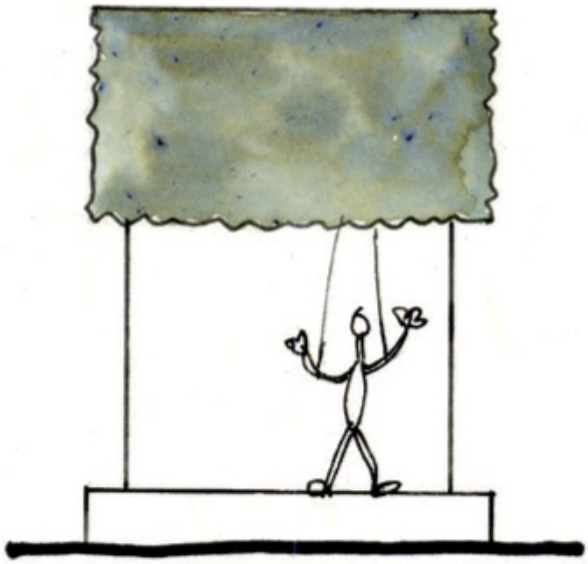
Simple masking in the form of a backdrop will screen the puppeteer's legs.



Side view Audience view

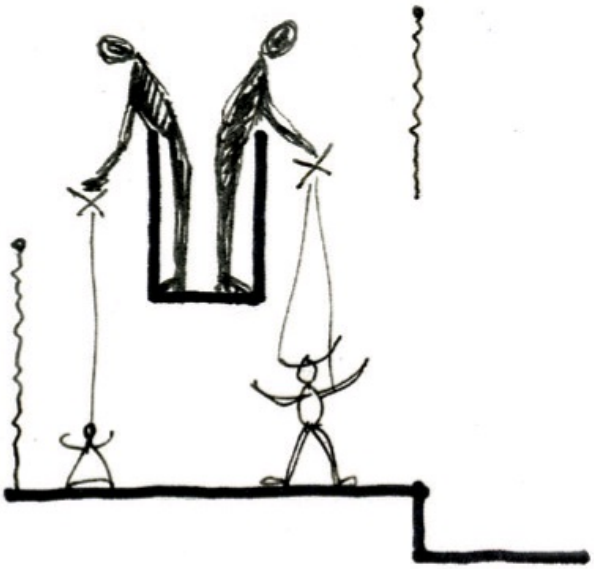
With the addition of a cloth hanging to mask the puppeteer from view, only the puppet is seen.

Side view

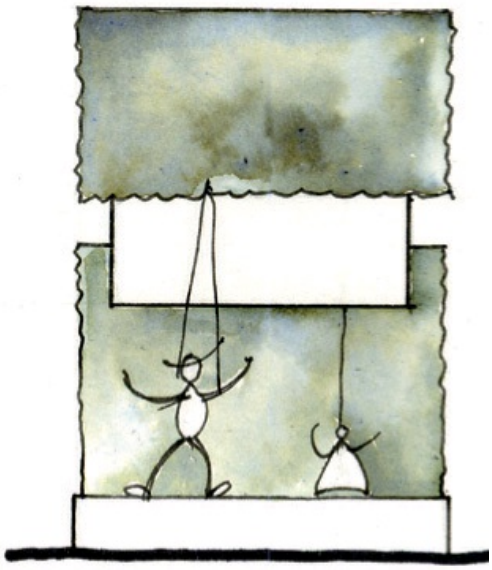


Audience view

To increase the height of the puppet's acting area, the puppeteer can stand on a raised 'bridge'.

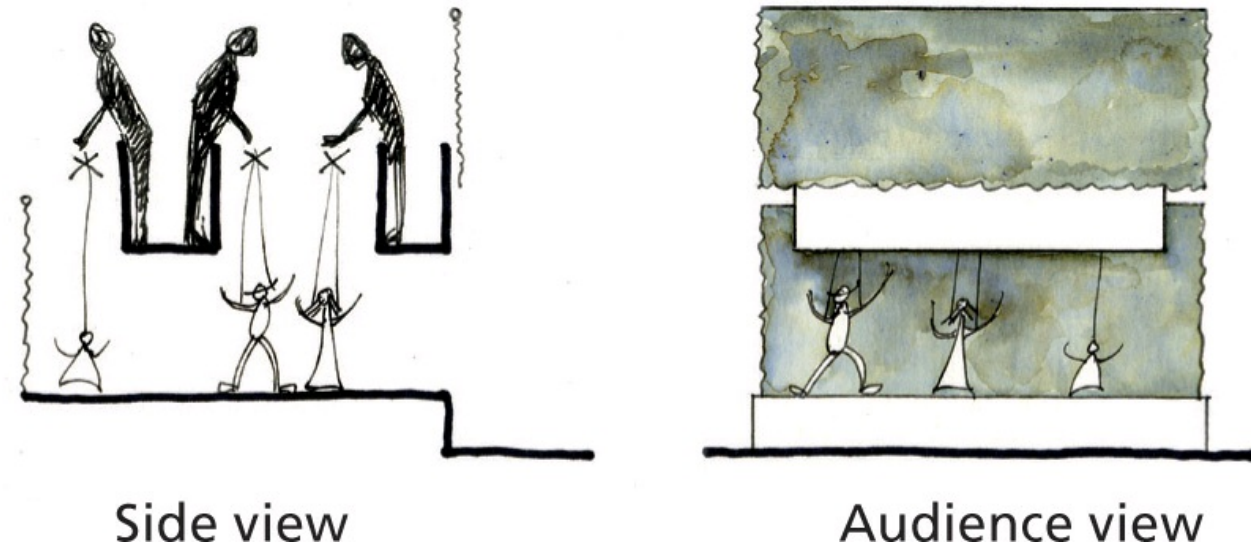


Side view



Audience view

A fly-over bridge allows the puppet stage to have a great depth for scenery and lighting.



Large productions use two bridges, one over the proscenium and one over the centre of the stage.

Permanent theatre or on tour

A purpose built puppet theatre can incorporate all the specialist needs of a complicated marionette production: good sight-lines, high bridges, lighting and sound equipment, rails to store the puppets, facilities to fly in scenery and so on.

The Little Angel Theatre, built in a bombed-out hall in London, has an excellent raked auditorium, generous backstage spaces and a workshop.

Taking all the kit for a show on tour requires ingenuity and a lot of hard work. Of all the puppet forms, the marionette is the trickiest to tour, because of the need to get the puppet and puppeteer off the ground, so the audience can see well.

Some clever puppet troupes have solved this problem by adapting a bus, caravan or even a boat into a portable theatre.

Other puppeteers keep it simple, performing with just a few lights provided by any theatre, or performing on the streets.

A touring marionette bridge, stage, masking and lighting, that packs down to fit into a van and can be assembled in a few hours. PuppetCraft's show *Monkey!*

The Puppet Theatre barge has an intimate auditorium and a fully equipped marionette stage.

Cabaret-style marionette performer Scott Land.

A busker on the streets performing cello music with a puppet of himself: Ettenoiram/travelling puppeteer.

A Punch and Judy show on the beach at Broadstairs in the 1950s with the traditional dog, Toby, sitting alongside the puppets.

Audience and purpose

All marionettes, like all puppets, are made to perform. The audience for a puppet show can be as varied as the many ways of making the puppets. The shows can be for children, families or adults, it all depends on the content – what the puppets will do and what the purpose is for using them.

Here are some examples showing the diversity of audiences.

In Britain in the early part of the twentieth century, puppetry was considered a child's entertainment, dominated by *Punch and Judy* glove-puppet shows on holiday beaches.

In the 2000s, the potential for theatrical puppetry for adults was rediscovered, with major productions like *War Horse* and *The Lion King* showing that puppetry can appeal to all ages.

In Indonesia, India and China, puppets perform long, epic stories from religious texts, for huge crowds of family audiences, combining history, religion and entertainment. Sometimes these same shows are performed in temples with no one there other than the performers, for the entertainment of 'the gods'!

The first marionette to become a television star was *Muffin the Mule*, in Britain in 1946. This was the start of a trend to use puppets on TV for children's programmes.

The acclaimed National Theatre production of *War Horse* has changed many people's perception of puppetry. The show is dominated by life-size horse puppets created by South

African puppet company Handspring.

A crowd of around 1,000 gathers to watch an outdoor performance of a Chinese marionette show.

A lavish production by the Quanzhou Puppet Troupe of the popular Chinese classic *Journey to the West* with well-known characters: the monk Tripitaka, Monkey King, Friar Sand and Pigsy.

Muffin the Mule was made in 1933 to be part of a puppet circus for the Hogarth Puppets, before becoming famous when shown on television.

A latex rubber puppet caricatured of Prince Charles from *Spitting Image*.

A giant 12-metre tall marionette controlled by ropes and pulleys performing for a large crowd in an aircraft hangar. ***Uprising of the Beast*** **by Bread and Puppet Theater, 1990**.

The toy Walking Bird puppet made in Project 1.

In 1984 the satirical television show for adults, *Spitting Image*, was launched, running until 1996.

Since the 1960s, Bread and Puppet Theater, based in the USA, has used puppetry in all its forms including large marionettes, often in issue-based theatre.

There are numerous ways marionettes are used:

- As a toy. A simple marionette is needed that is easy to use and easy to

untangle when the strings get into a mess … and they will!

- As a teaching tool to educate in a school, religious or other context.
- As a therapeutic aid. To work with people young and old, using the unique qualities of puppets, as art therapy and in role-play.
- As a theatrical being. Be they human, animal or abstract in form, they can be a silent character or a ‘speaking’ puppet with words spoken by the puppet operator, a narrator, or using a pre-recorded soundtrack. This includes mime, comedy and tragedy.
- As solo singers or part of a puppet musical or opera.
- Marionettes are brilliant dancers, as they can spin really fast, do high-kicks well beyond any human’s capability and can float off the ground.
- Variety acts, such as tightrope walking, performing magic, and playing a musical instrument.
- In street parades. For instance, since 1931, Macy’s Thanksgiving Day Parade in New York City has used large helium filled balloons, that are upside-down floating marionettes.
- As satire and political comment.
- As art. Artists have exhibited marionettes in art galleries.

For PuppetCraft's show *Monkey!*, the puppeteers speak for the puppets they are working.

The Dancer puppet, made in Project 2, spinning and floating.

Marionettes are used as pure entertainment, an educational tool, satire, art or as a therapeutic aid. They are wonderful when they are doing what they can do best, be it exaggerated movements, trick transformations or floating. They can be funny or serious, telling stories, or just dancing.

Very little is impossible on the marionette stage, and the more this capability is used the more interesting the performance will be.

STRENGTHS AND WEAKNESSES

Marionettes are bad at:

- Very fast, precise movement, which is extremely difficult as there is a time lag to all the movements due to the length of the control strings.
- Imitating accurately the full range of movements and emotions of a human. It is best to leave complex expressions to the human actor, and to choose which movements you want your puppet to perform well.
- Speaking long scripts. Again best left to human actors. It can be interesting to use gibberish rather than actual words.
- Picking up and putting down objects. Some puppets have hands that can open and close, to pick up props, but this is a difficult skill to master. An alternative is to have a 'run-through' string from the object to the puppet's hand and up to the control, so pulling the string will guide the hand to the object. Not easy!
- Taking off clothes. As the strings run through the costume, this becomes a tricky move, while putting clothes on is nearly impossible.

Marionettes are good at:

- Not trying to be little people, but rather finding things they can do better than their human counterparts, or portraying the 'essence' of people.
- Being animals. Fish, birds, lions and so on all make wonderful marionettes. A puppet of a human and an animal will feel like they are part of the same world; in the human theatre having a person and a lion talking to each other is difficult to achieve, while for puppets this is easy.
- Doing something active. They are best when they have something dynamic to do, like climbing on a chair, jumping over a hole, and waking up.
- Dancing. Some of the best marionette performances are purely dances to music.
- Variety acts. A weightlifter, a musician, a juggler, and a clown are all classic marionette acts.
- Floating and flying. A bird, mermaid or astronaut are all excellent

ideas for a marionette.

Doing ‘puppet tricks’.

- Expanding, becoming taller and taller.
- Transforming. There are puppets that can transform in a blink from being a beautiful princess into an ugly demon; some change from being male to female; others change from being a large single figure into a lot of little puppets.
- Coming apart. The Victorian *Dissecting Skeleton* is the most famous, with the skeleton able to fall into a pile of bones and then re-form again. Puppets can be cut in half or beheaded quite easily.
- Exaggeration, for example, a fat person can be really, really fat, a thin person can be really, really skinny. Their facial expressions and movements can be larger than life.
- Singing. Being a stylized form of communication, singing works well with puppets. Haydn wrote operas for marionettes, and The Salzburg Marionettes have become famous performing Mozart’s operas.
- Telling stories: this can be through moving to a spoken narration, dialogue between the puppets, or just through movement like a ballet.

A large flying bird puppet with a tiny puppet *Sinbad*, by PuppetCraft.

A modern version of *The Dissecting Skeleton*.

A traditional Indian marionette that transforms from a man, by flipping the puppet over, to reveal a woman hidden beneath the skirt.

The Salzburg Marionettes performing Mozart's *The Magic Flute*.

CHAPTER TWO

MAKING METHODS

Form

A marionette can be human, animal, abstract or alien in form. The look of the puppet can be chosen to be whatever you want: rounded shapes or sharp, crisp forms, textured or smooth, detailed or simple, brightly coloured or plain.

The outer surface is what will be seen, so materials are chosen to give the desired form, colour and texture. The colour and finish can be altered by applying paint or a covering.

Workbench in PuppetCraft's workshop.

This carved wooden head has crisp forms. It can be left as it is, to show the wood or it can be painted.

A puppet made from stuffed fabric has soft, rounded forms.

Function

The materials used to create the form need to be strong enough to hold all the parts together during performances, or an additional structure needs to be added under the surface.

The structure of a marionette performs the same function as a human or

animal skeleton; it supports the body, allows movement and does not break or fall apart! To achieve movement, rigid sections of the skeleton are connected with flexible joints, each with a precise range of movements with a ‘stop’ position, for example, the knee joint only allows the leg to bend in one direction.

A marionette’s core can be made from rigid parts, connected together with flexible joints, or the whole structure can be pliable, like rope or fabric. All marionettes have some additional needs: firm attachment points for strings to control the puppet, and ‘just the right weight’ – not too heavy … but not too light.

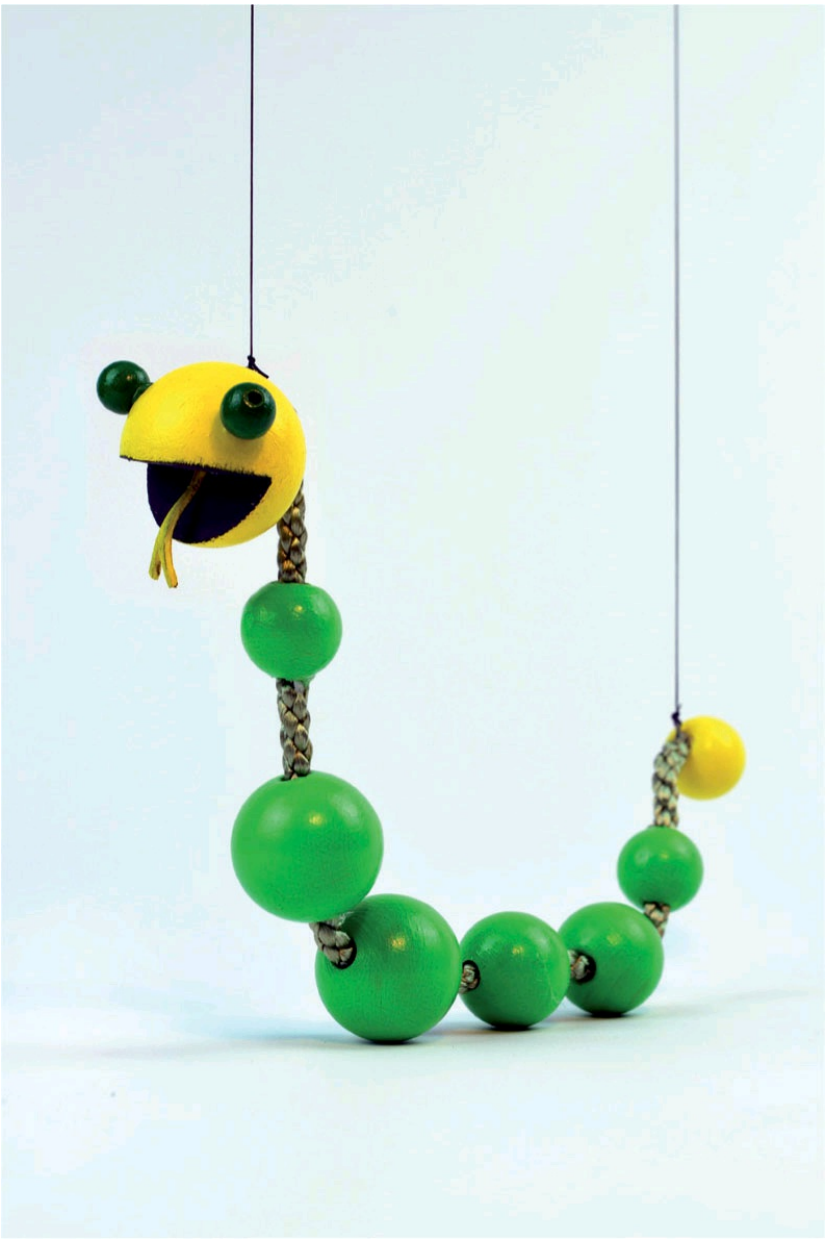
Materials

The materials to make marionettes are selected to match the needs of form and function.

- Some materials are able to fill both needs. For example, wood can be shaped into a form, while being a structural material too, able to make strong joints and attachment points for strings; a fabric handkerchief can act as both form and joints, because of its flexibility.
- Different parts of a marionette need to have different weights. For a human puppet, the head and chest need to be as light as practical, while the pelvis wants to be the heaviest section, being the centre of gravity. Feet should have enough weight to anchor the puppet, while hands need to have a medium-weight so as to be responsive to the puppeteer.
- Often, materials with different characteristics are combined. For example, a wooden pelvis for weight is combined with a light papier mâché head and a wire-frame body, all joined with bits of fabric.
- The ‘longevity’ of the puppet needs to be considered. If it is to last for only a few hours, fragile materials and structure are fine, but if a puppet needs to perform hundreds of times without needing repair, very robust materials and jointing methods need to be used.
- The puppet’s environmental impact should be taken into account. Even when a puppet is small, it is worth deciding which are the least polluting materials to use. Being a natural material, wood is an excellent

example of a low-impact substance, if it is sourced from a sustainable forest. Some plastics come with a high ecological cost, while others are made from recycled materials and can bio-degrade. If you can ‘up-cycle’ bits of discarded plastic, you are helping reduce waste.

A carved wooden puppet jointed with cord and screw-eyes to give movement. The wood is structurally strong, making fixing the control strings easy.



Combining flexible rope with the weight of wooden beads gives this puppet its look and characteristic movement.

A handkerchief puppet where one material provides both form and movement.

Different making methods

The method of making will be dictated by who will do the making, what skills and tools they have, and by the form and functional needs of the puppet. Budget and time available will also affect the choice. Different techniques are appropriate to use for different parts of the marionette. Some of the making methods can be used for the entire puppet.

Below are techniques and materials commonly used to make simple marionettes.

Papier mâché layers

Often used to make heads, and can be used for arms, legs, bodies and feet, but seldom for hands unless they are large or very simple.

First, a shape is modelled from clay or plasticine. This is easy to do in such a malleable material that can be added to. Layers of paper are glued over the finished shape. When the papier mâché is dry, the form is cut open, the clay/plasticine is removed and the two halves are glued together again, making an extremely light and strong hollow shell.

Papier mâché layers can also be built over any light-weight form, like a plastic bottle, a balloon, a wire frame or scrunched paper. The advantage here is that the dried papier mâché does not need to be cut open to remove the original form.

A clay head is modelled, covered in papier mâché layers, cut open to remove the clay, and then fixed together with a wooden neck and wire attachments for control strings.

Papier mâché pulp

Paper-pulp is good to use to make any part of a puppet, including hands.

This can be modelled and once dry it can be sanded and painted. The shapes tend to be less refined than working in clay/plasticine, and as it dries the paper pulp usually shrinks and makes a rough surface. To get a smooth finish, it can be covered with a filler.

A plastic bottle is turned into a head by adding a neck and wire fixings, before a layer of coloured tissue paper is glued on.

Scrunched newspaper, wrapped in masking tape, makes a light core for a papier mâché pulp head. A wooden neck and a cross piece for head strings are built into the paper before the pulp is sculpted. A wire armature is made for the hands to give form and strength.

Carving

Carving wood is the most commonly used traditional method of making marionettes. Some plastics can also be carved.

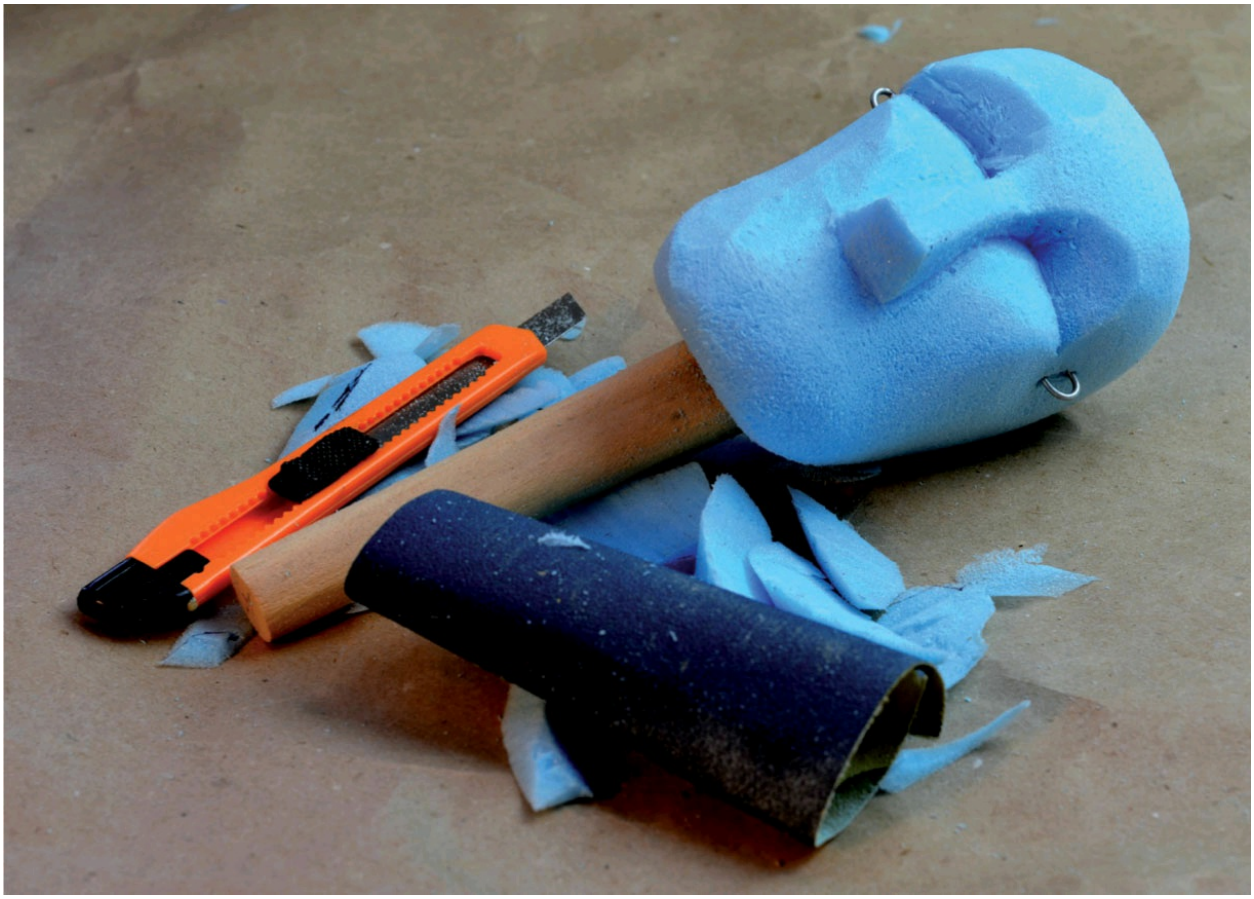
Carving is a 'taking away' method, so it needs careful planning and execution. The forms tend to be 'sharp' with crisp, simple flat shapes.

Wood is excellent for any part of a puppet. With a few tools the entire marionette can be carved. Once mastered, this technique is very fast, without the need to wait for anything to dry. Wood can be carved into simple or complex forms. Once the puppet has been roughly shaped, it can be refined into silky smooth surfaces, textured, painted or left as bare wood. As wood is strong, it simplifies forming connections and joints. The puppet can be reduced in weight by hollowing large sections.

The puppet detailed in Project 3, carved from wood, with wooden, rope and leather joints.

Many aerated plastics like polystyrene, styrofoam, Plastazote and foam rubber can be carved. A big advantage of these modern materials is they are light-weight, making them good for larger heads and body parts. Only very simple hands can be made from these plastics. It can be cut with a saw and a sharp craft knife. Polystyrene and styrofoam can be sanded to give a surprisingly smooth surface and then covered in layers of paper, or a gauzy fabric glued on, to make a light but strong shape. Plastazote and foam rubber is used when a bulky shape is wanted under clothes. As foam rubber is flexible it can be used where soft movement is needed.

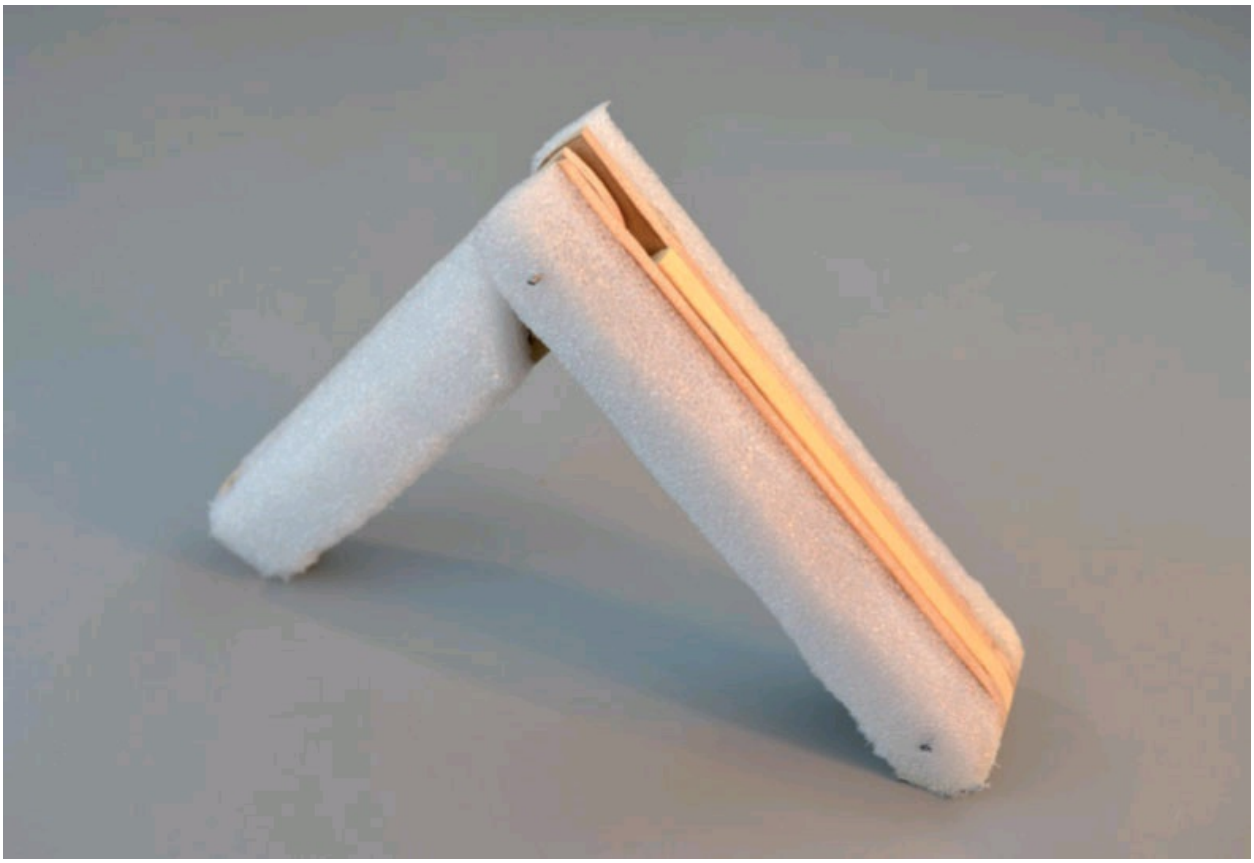
These plastics need a structural core and string fixing points built into the puppet.



Blue styrofoam is cut with a saw and then carved using a craft knife. A wooden neck is glued into the head and string-fixings are made with wire. Sandpaper is used to smooth the carved surface.

The styrofoam head has a few layers of paper glued over it to make a strong surface. The dry papier mâché is sanded before adding a layer of filler.

A hand with soft fingers and thumb, made by gluing foam-rubber to a palm-shaped piece of wood.



A leg made from a plywood core, with foamed plastic glued on to give form.

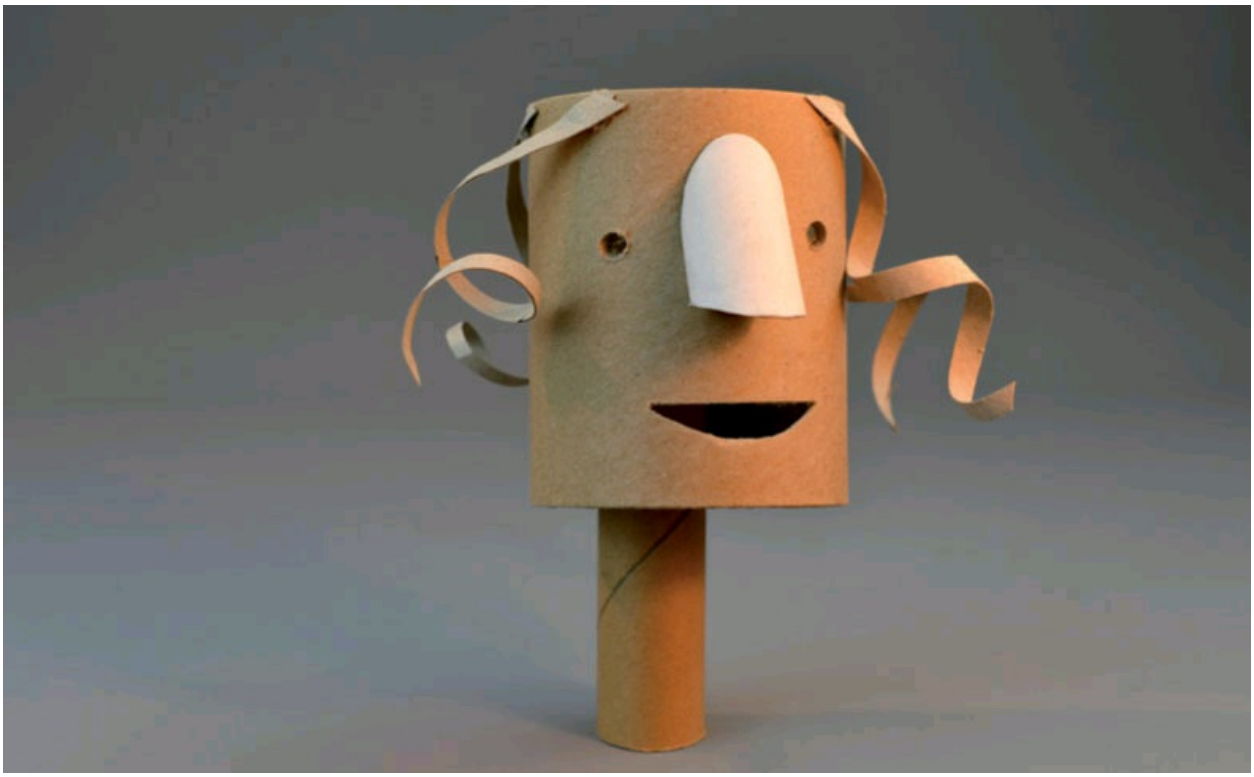
Blocks of wood

Bits of wood can be sawn, drilled, glued, screwed or nailed together to make any part of a marionette. It is strong enough to connect securely, and is easy to sand and paint. Different woods can be chosen for their properties: colour, weight and strength.

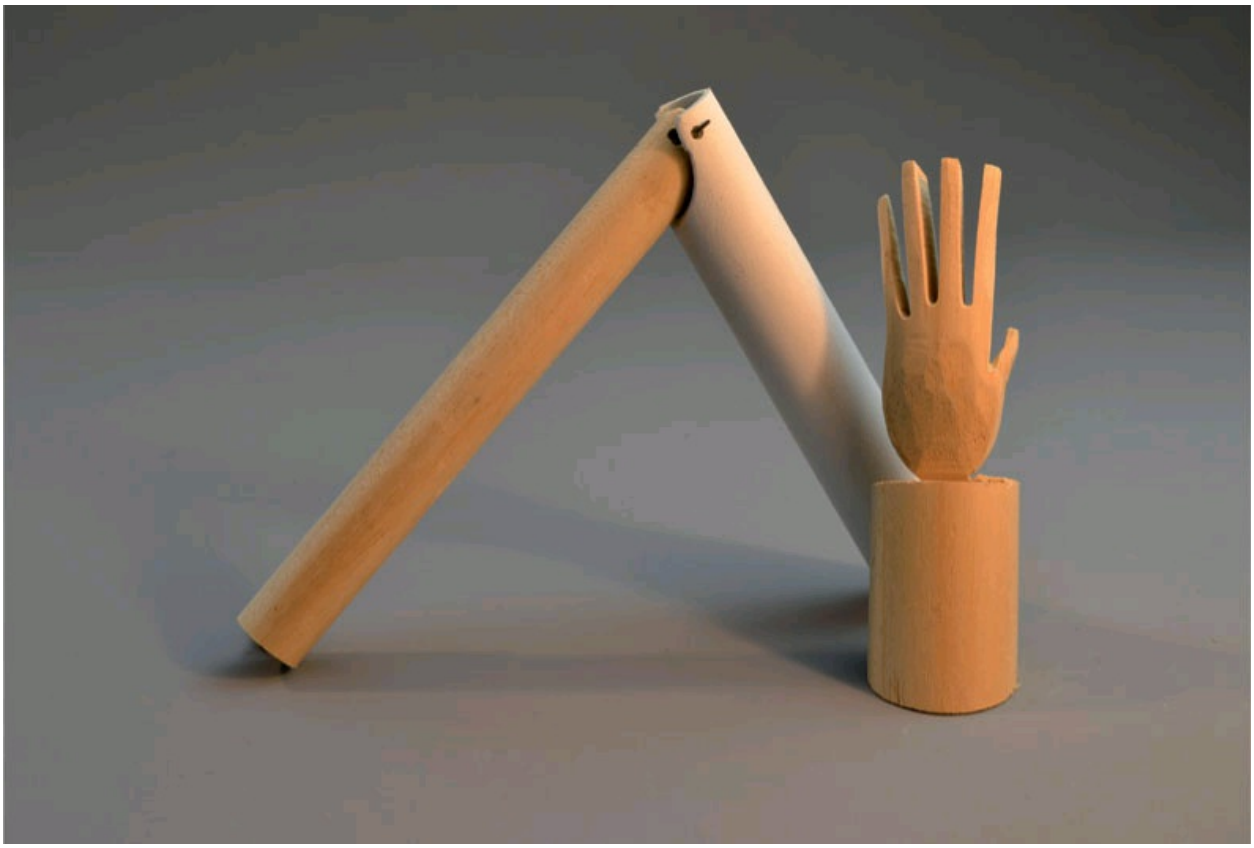
A stylized head made from sawn and sanded bits of wood, glued together.

Tubes and dowels

Wooden dowel rods, bamboo and plastic tubes make excellent arms and legs. Large tubes can be used to make bodies and heads. These are strong and easy to join. Simple hands can be made by cutting into the tube/dowel or by gluing tube/dowel fingers onto a palm shape.



Different size cardboard tubes glued together to form a head.



A knee joint made from a plastic tube and dowel, and a hand cut from a thick wooden dowel.

Rigid sheet materials

Rigid sheets of wood, plywood, cardboard, plastics or metal can be cut, drilled, glued or riveted together to make simple forms. Very thin sheets can be bent into gentle curves.

A head and hand made from plywood, built up in 'contours'.

Thin, flexible sheet material: paper, cardboard, leather and plastic

Cut, folded and rolled paper, card, thin plastic or leather make very light and strong puppets. Simple shapes are easy, while complex forms are more tricky, but amazing detail is possible. Think of the art of origami.

For a fast-to-make marionette that does not need to last, scrunching paper over a strong core can work well. Weight in some form will be added to feet, hands and body, and wire loops bedded into the paper will take the marionette's strings.

A try-out puppet, made from scrunched newspaper wrapped in masking tape, over cardboard. The head is a cardboard hollow box-shape.

Fabric, knitted and felted

An entire puppet can be made from sewn fabric, knitted or felted, with sections stiffened with an internal frame or by creating hollow pockets that are stuffed with something like sawdust or sheep's wool. Sections without stuffing form the joints.

A fabric puppet made with some sections lightly stuffed to allow movement.

A knitted puppet head with sheep's wool fleece for its beard.

Needle-felted and wet-felted puppets made from dyed sheep's wool, over a pipe-cleaner jointed core.

Polymer clay and epoxy putty

Polymer clays such as Fimo or Sculpey model like a fine clay/plasticine, but dry hard, by being baked in a household oven.

Epoxy putty like Milliput or PlasticWeld is used by mixing two parts together, before modelling. The putty sets at room temperature and is extremely strong.

These products are expensive, heavy and can be chipped, so are best only used for small puppets or parts of a larger puppet. Good for finely shaped hands, over a wire core.

A small head made completely from polymer clay, including the hair. The eyes are added diamanté.

Wire

Used mainly as a structural core, or an anchor point for strings or joints, wire can also be used to make an entire puppet.

A wire puppet, quickly made using just a pair of pliers. Lead weights have been added to the feet and body.

Frames

Wire, thin strips of cardboard or plastic, reeds or split bamboo can all be formed into open lattices that can be useful to make bulky sections like the chest and pelvis. Simple, large heads can also be made. The result is a strong, light-weight, open frame that needs to be covered in some way, usually with fabric or foam rubber. Sometimes the framework might be left

exposed.

A vintage puppet chest from China, made from strips of bamboo woven into a beautiful light shape.

Using found objects

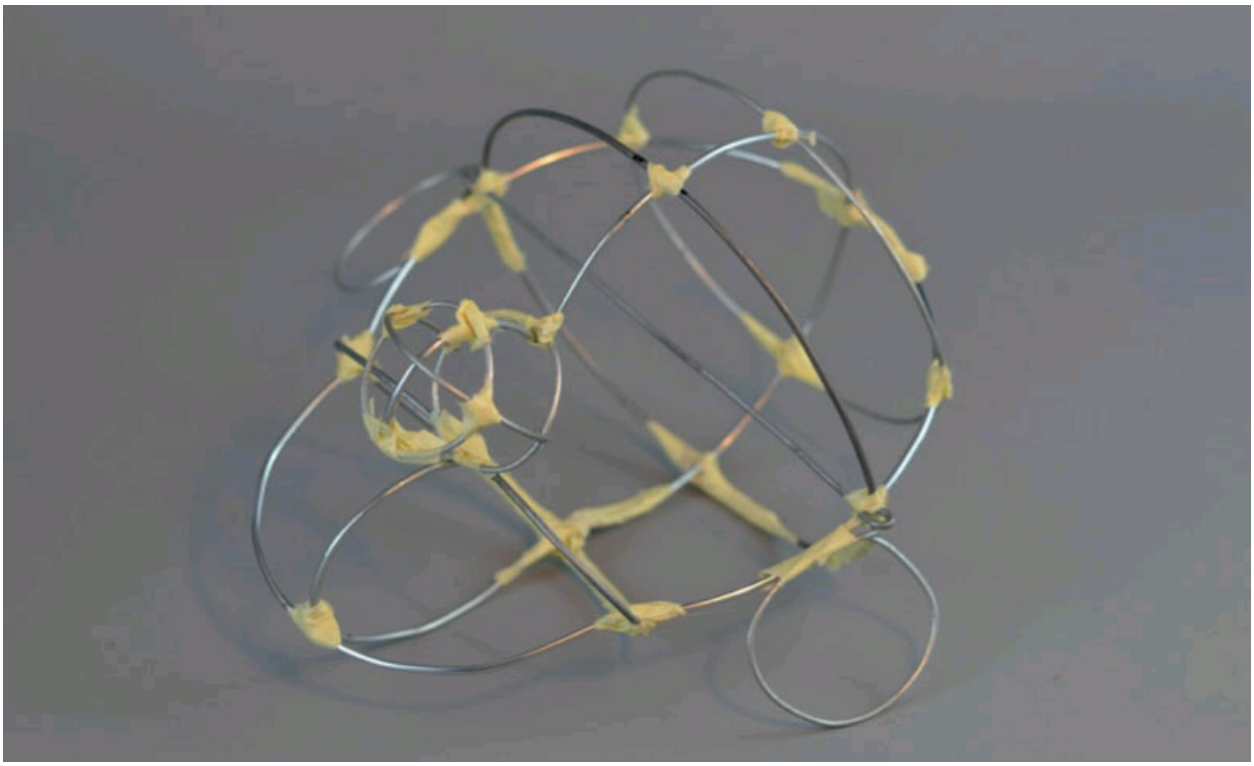
Joining together everyday objects can make great puppets. For example, leaves, feathers, branches, tin cans and forks can all be tried.

Objects can be used for their shape, for example, a plastic milk bottle covered in tissue paper makes a very effective head. Alternatively, objects can be used without modification, leaving all their qualities unaltered.

It is tricky to get the right weight and balance when fixing found objects

together while allowing movement. If the objects are fragile or perishable, the puppet will only last a short time, while if more robust things are used, the puppet can be as strong as any other making method.

Tin cans, old spoons and forks have been wired together to make a junk metal creature.



A simple head made from wire, bent and taped together, and covered in a stretch fabric.

Bits of firewood have been sawn, drilled and screwed together, creating some type of animal puppet.

Combining materials

This is a very common method of making a marionette.

Materials are chosen for their different attributes to get a good balance between form and function, to make a puppet that moves well, is well balanced, with just enough weight at the right places, looks good and is strong enough for its planned life.

Less usual methods

With imagination and experimentation, almost any material can be made into a marionette. People have tried using ice, kitchen foil, beaten copper, fruit, bread, and pretty well anything!

The Spirit of Unhappiness **with carved wooden head, hands and chest, with flowing fabric connecting it all together. From The Bet, made by John Roberts for Norwich Puppet Theatre**.

MORE COMPLEX METHODS

Any technique can be used to create simple marionettes, but the complexity and cost of some methods do not make them an obvious choice. Expensive and hi-tech materials are usually only justified if the puppets have a very particular requirement, such as needing to be very robust, or very light, or if you need to mass produce your puppet.

As modern materials are developed, the range of puppet making techniques are constantly expanding and changing.

CASTING

This makes a very accurate copy of a shape. A clay or carved wooden form is sculpted. A negative mould is then made of the sculpted form using a rigid or flexible compound. Liquid is poured into the mould to make the final product, or layers of paper or fibreglass can be laid into the mould.

A rigid mould is made from plaster of Paris. If the original shape is clay, a two-part mould is made, so it can be opened to release the original. If cast over a solid form, the plaster of Paris mould may need to be made in many sections, to be able to get the original out.

A flexible mould can be made from silicon or rubber. This makes releasing a complicated shape with undercuts and detail far easier. But the materials are expensive, so this is a costly option.

The final form can be cast from fibreglass, papier mâché layers, plastic or rubber. All of these materials make excellent puppet heads, hands and bodies that can be painted and are very robust.

This is a useful technique if you need a number of copies of the same puppet. The process is often slow. You need to make the mould, there can be a long drying time and finishing usually requires gluing sections together and cutting away the leftover casting and joining marks.

A two-part plaster of Paris mould has been made of some carved heads, from which latex rubber casts are being prepared.

Two identical polyester resin heads have been cast from a flexible silicon mould. The mould was made by pouring silicon around a carved wooden head.

THERMOPLASTICS

There is a large range of thermoplastics that when heated become pliable, and when cooled become solid again. Used when an extremely light-weight finished product is wanted. Most thermoplastics will soften again if heated, so working a puppet near a hot light may cause a meltdown.

Sheets of thermoplastic

Sheets can be cut with scissors, softened with hot water or a heat gun, and shaped over a form, sticking well to itself.

Vacuum forming

A body part is made from wood or clay, which is placed in a vacuum forming machine. A sheet of thermoplastic is heated and sucked over the shape, which is removed to be used again, leaving a thin, strong plastic shell.

Granules

Softened granules are pressed into a mould to make a finely detailed component, or the heated granules can be worked in the hands to model simple shapes.

COMPUTER AIDED DESIGN

Computer Aided Design (CAD) is opening up a whole new way of making puppets. This requires investment of time to train the designer/technician, and there is a high cost to buy the equipment. A shape is designed on a computer, or a sculpted part is scanned. To make the finished 3D object, the computer guides a milling machine to cut plastic, wood or metal into the designed shape, or a 3D printer 'prints' layers of plastic to make the most intricate forms imaginable, including interlocking components.

Different thermoplastics are softened with a hot-air gun. There are thick cardboard-like plastics, transparent sheets, and plastic beads.

Computer aided designed (CAD) parts are manufactured in nylon by a 3D printer.

CHAPTER THREE

GETTING READY TO MAKE

Each of the three projects in this book uses different techniques, but there are some tools, materials, equipment and methods that are common across the projects.

The finished puppets described in the three projects.

The workspace

If you have a workshop with a bench and vice, that is great, but a strong table is all that is needed.

If a ‘clean’ table is used, protect the top by placing a blanket on it, and then clamp a sheet of plywood or MDF (at least 15mm thick x 50cm x

50cm) on top of the blanket with two G-clamps. Protect the underside of the table against damage from the clamps with pads of cardboard.

A dustsheet can be put on the floor to catch sawdust.

Whatever your space, have bright lighting.

A hook above your table is needed so you can hang your puppets up while working. If you can't put a hook in your ceiling, use some form of a stand to support a rail, from which you can hang a cord with a wire hook at the end.

A warning

The making process can be a danger to young children, as there will be small items, sharp tools, glues, clamps, and paints.

Some of the glue and wax is strong smelling, so you need a workspace that can be well ventilated.

The finished puppets are not toys for a young child to play with unsupervised. There are bits that might fall off and choke a baby, or eyes might be hit by spinning puppet hands and so on.

Stock tools

Buy or borrow the best tools you can. Poor tools lead to frustration and errors. The saying 'a bad workman blames his tools' is wrong! It should be 'a good worker knows the value of good tools'.

From a hardware shop, DIY and tool suppliers:

- Coping saw with a few spare blades. This is an amazing bit of kit that can cut curved shapes.
- G-clamp with at least a 100mm throat. One needed plus an extra two if you are going to protect your table with a board.
- Cordless hand drill: easy and safe to use and amazingly affordable.
- Drill bits: ground high speed steel (HSS) bits made for drilling into wood, metal and plastics. Buy a set ranging from 1.5mm to 6mm, in 0.5mm increments. Buy two spare 1.5mm bits.

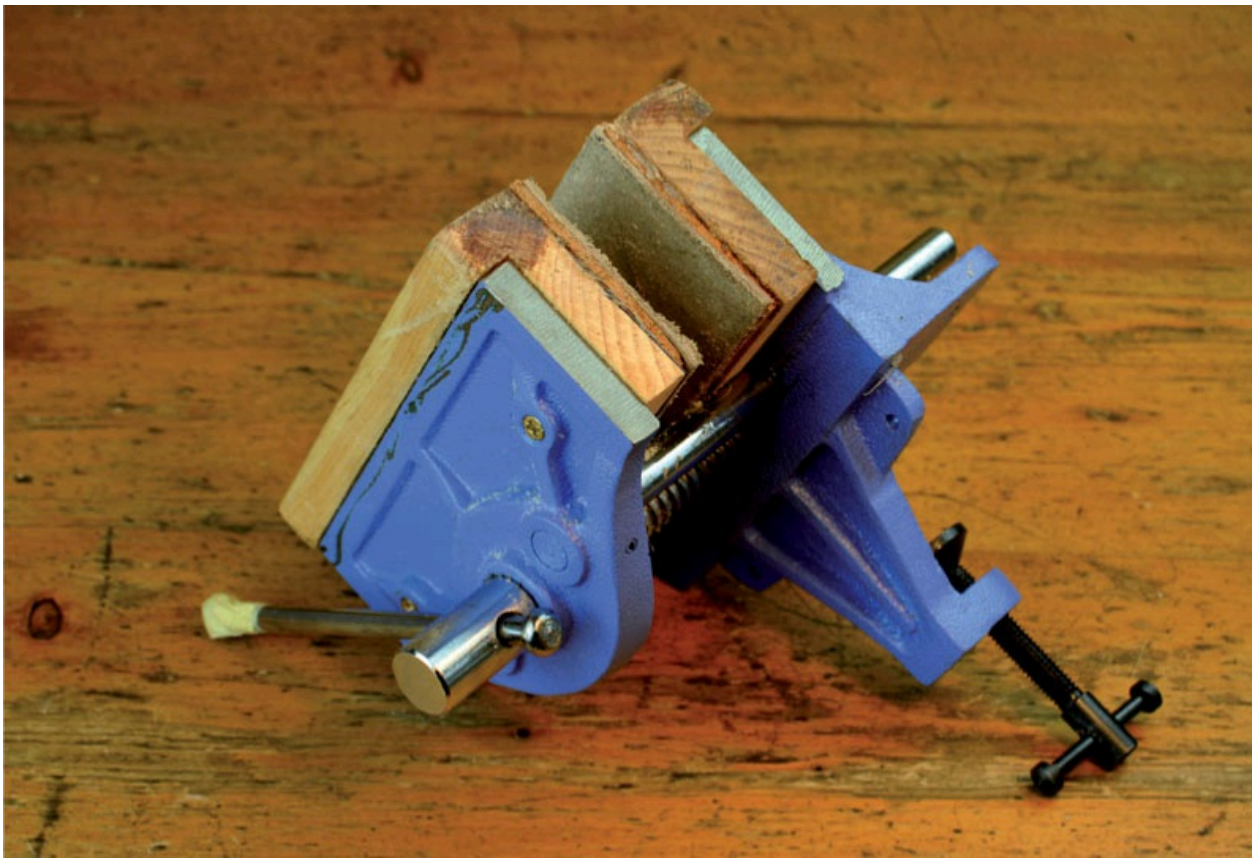
- Hammer: a small pin-hammer about 100g.
- Pliers. Get ones that can bend and cut wire.
- Bradawl.
- Pair of scissors for general use to cut paper, cardboard, and cord.
- Cork sanding block.
- Screwdriver with slotted tip about 6mm and handle about 100mm long.
- Tape measure.
- Dustpan and a new, clean brush.
- Not needed for Projects 1 and 2, but essential for Project 3: a vice to hold wood while you work. A small clamp-on vice is all that is needed, with lined jaws, able to clamp at least 10cm.

Stock tools needed for the three projects.

From a stationery or craft shop:

- 2B pencil.

- Rubber (USA= eraser).
- Pencil sharpener.
- Ballpoint pen.
- Large map pins x 2.
- Steel ruler with cork on back to prevent slipping.



A small clamp-on vice with jaws lined with wood, cork and leather to help grip wood without marking.

From home:

- Two old toothbrushes: clean and dry.

Stock items

Buy from timber merchant, supermarkets, hardware, fabric, stationery and craft shops:

- Roll of masking tape around 19mm wide.
- Five sheets of A4 size tracing paper.
- Glue: UHU All Purpose Adhesive or Bostik All Purpose Adhesive, flammable. Both these glues are clear and fast drying. They smell of acetone (like nail polish remover) till they are dry and will sting if you get a scratch on your hand. A 20ml tube is enough.
- Thread: at least 25 metres of linen, 3/18 thread of any colour. This is roughly 0.6mm thick. Used by leather workers. You may need to hunt on the internet.
- Cord: polyester or nylon, braided, any colour. 2mm x 1m.
- Chamois leather: at least 15cm x 15cm.
- Screw-eyes: 16mm overall length with 5.5mm eye-hole. Seventeen needed.
- Strip of pine wood: planed all round, finished size close to 14mm x 14mm x 1m. Can be cut into shorter lengths: 23cm, 30cm, 40cm. For controls.
- Scrap of wood, MDF or plywood to drill into. At least 15mm x 90mm x 270mm.
- Abrasive: any sandpaper will do, but cloth-backed aluminium oxide abrasive is far better than a paper-backed abrasive. Although it is expensive, it will not tear or wear out as quickly. Available from woodturner suppliers. Three grades are needed: coarse 80-grit, medium 120-grit, and fine 240-grit. At least one sheet (typically 23cm x 28cm) of each grade, or if bought in 10cm-wide strips: 1m of coarse, 0.5m each of medium and fine. Never cut sandpaper with scissors or a knife; fold and tear it across a sharp table edge.
- Two wire coat hangers. At least 2.15mm (13.5 gauge) thick wire.
- Furniture wax polish.
- Bamboo toothpicks/cocktail sticks.
- Scrap of clean white, lint-free cloth about 30cm x 50cm.
- Fabric-backed adhesive bandages/plasters for minor cuts, and some antiseptic wound wipes.
- If you are susceptible to sawdust, a dust mask.

Stock items.

Techniques

There are some techniques that will be used again and again throughout the three projects.

You may know these methods already, but for those new to this type of work, here are some tips.

Transferring designs to the wood

Trace templates onto tracing paper using a soft 2B pencil.

Cut around the outline, so you can trace around it onto the wood.

Tape tracing paper onto wood with a grainarrow aligned to the wood's grain, and draw around the paper.

For inner lines, tape the tracing to the wood with the pencil-side down. Use a ballpoint pen, pressing quite hard, to transfer the inner lines. If you

need to transfer inner lines without flipping the tracing, go over the inner lines on the back of the tracing with the 2B pencil. You can then mark these lines using the pen.

Use a bradawl to mark the centre points of circles and drill holes, pushing through the paper into the wood.

Drilling

If you have not used a drill before here is a quick guide.

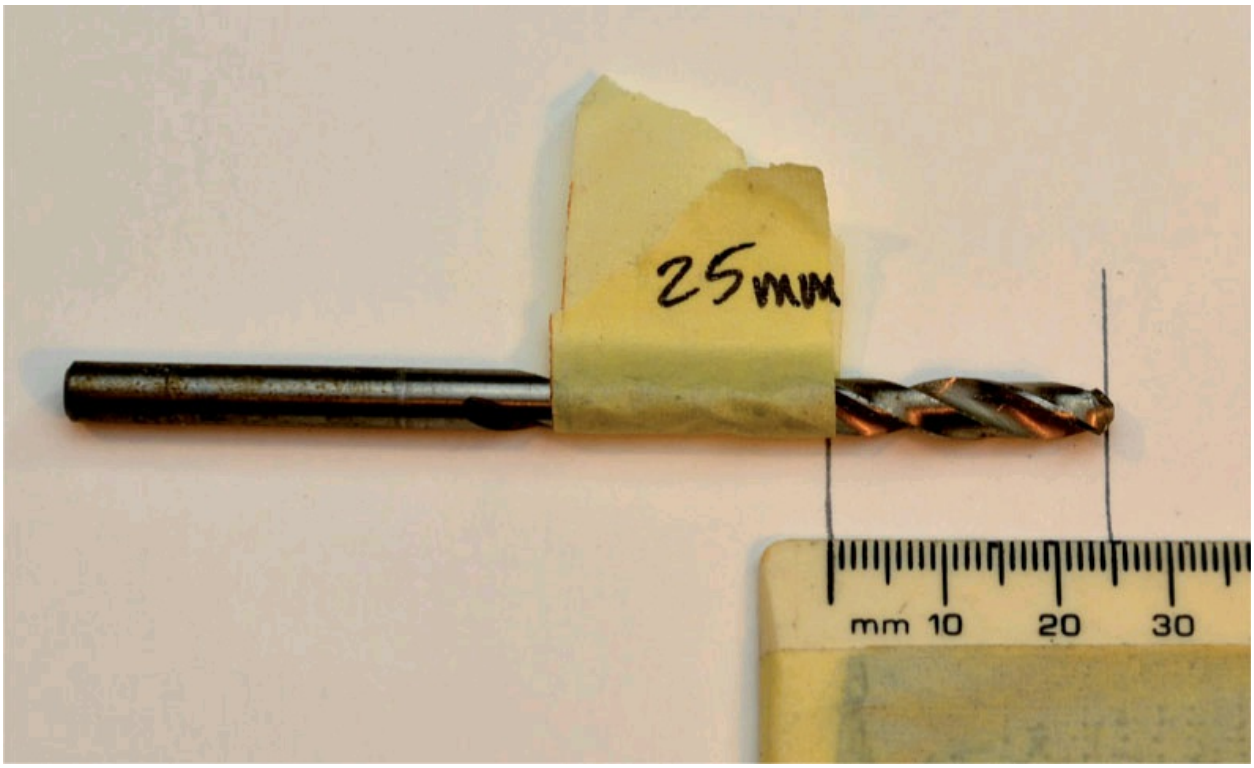
Bradawl first to mark where you are going to drill. Press and twist the bradawl into the wood about 1mm.

Put a drill bit into the chuck, by at least 10mm and tighten the chuck firmly. Check the bit is in straight by drilling into the air.

Run the drill at high speed, making sure it is set on ‘forward’ so the drill rotates clockwise as seen from the back of the drill.

Always start drilling perpendicular to a surface, going in about 1mm and stop. Angle the drill to the required angle and drill as far as you need. Once you have gone a few millimetres into the wood do not change direction, as you might snap the drill bit. Keep the drill running forward as you pull out.

If you need a hole of a particular depth, stick a masking tape flag onto the drill bit to mark what depth you want.



A masking tape flag used as a depth gauge.

Know about wood grain

Wood grain consists of patterns of darkish lines against a lighter background. These lines are made as the tree grows at different rates through the year, with slow growth producing darker, denser wood.

On the ends of a plank there will be lines that are parts of concentric rings called growthrings. This is the end-grain.

On the other surfaces of a plank the grain will be straight or curved lines roughly parallel with each other. These join up at the ends with the end-grain.

Wood is strong along the length of the grain. Pencils have the grain running from end to end, otherwise they would break!

Tying knots

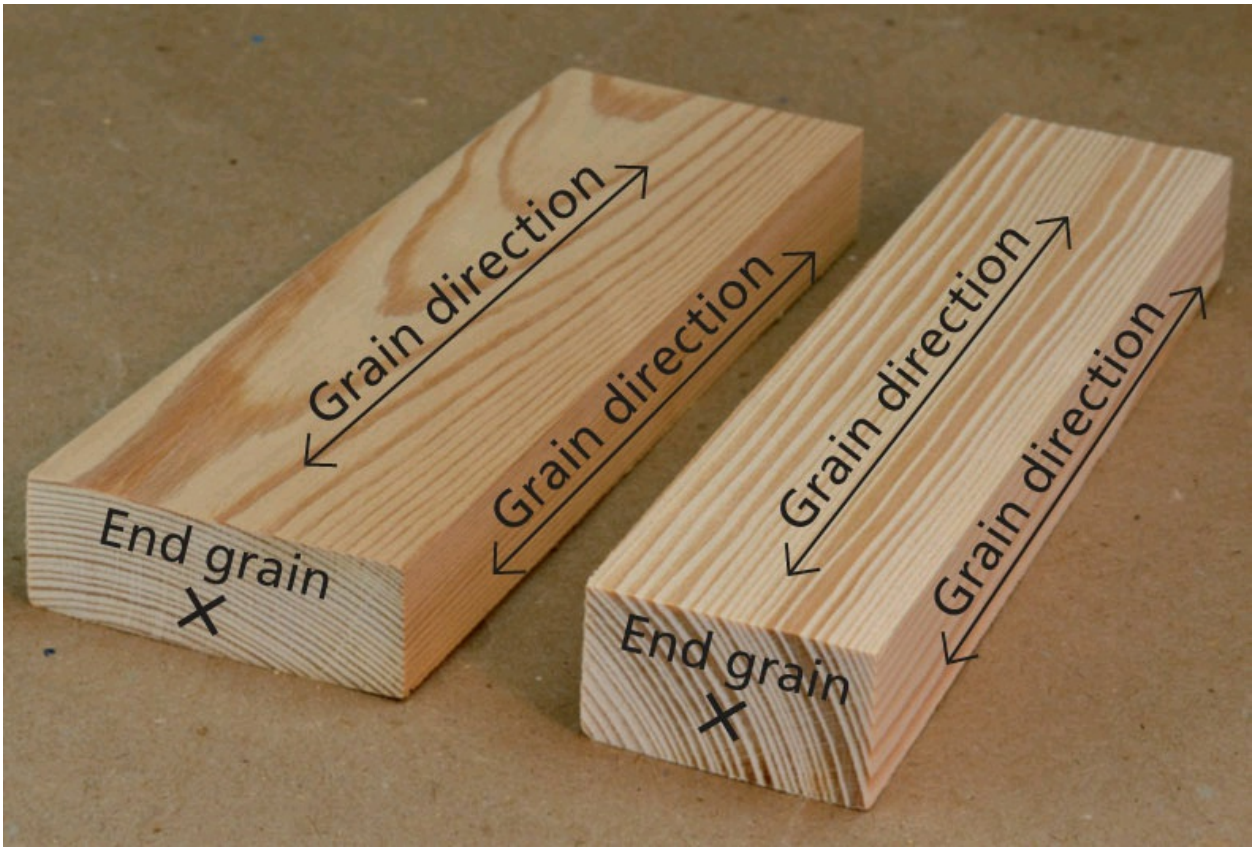
To prevent the puppet strings slipping, most knots are made as two half-hitches; I will call this a full knot.

Some of the knots are first tied as a half-hitch, so as to adjust the

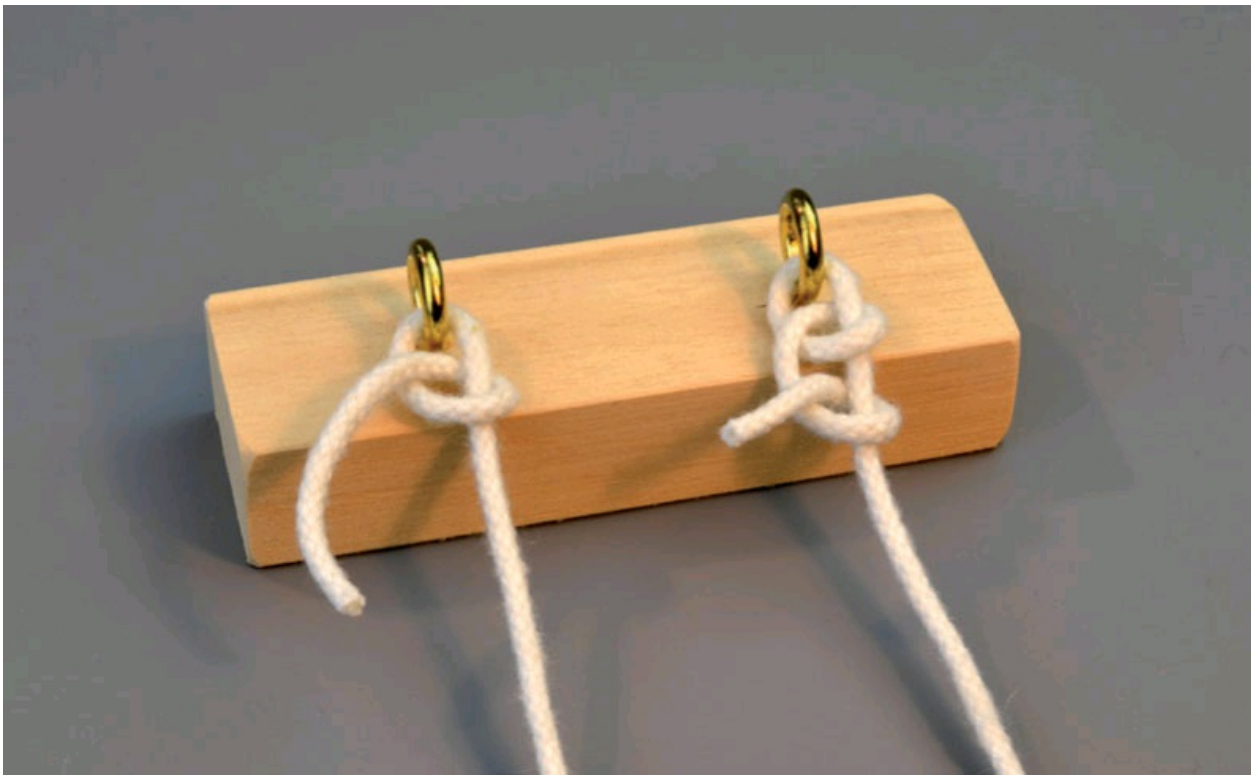
length, before tying the second hitch. I will call this a half knot.

Screw-eyes

Make sure all screw-eyes are fully screwed into the wood to prevent the puppet strings slipping out of the screw-eye where there is often a tiny gap in the eye. Do not overtighten the screw-eyes, as they can snap or start spinning in the wood. Use pliers if needed.



Wood showing the end-grain and grain pattern.



Left: a half-hitch tied to a screw-eye. Right: two half-hitches.

Hold wood firm

Always G-clamp or hold wood in a vice. This is safe and with the work held firmly you can get far greater pressure for sawing, sanding, drilling and carving.

CHAPTER FOUR

PROJECT 1: A WALKING BIRD

This is a very simple toy string-puppet.

A walking bird string-puppet can be found in many toyshops and is a popular puppet with buskers. This is because it is a very easy puppet to make and it is also simple to operate. The movement and fun that can be obtained from this marionette is surprising.

Although it is a simple and fun toy, do not let anyone under eight play with it unsupervised, as there are small bits that might fall off and strings can be a hazard for the very young.

The puppet's height is 32cm.

The Walking Bird puppet goes for a walk.

Techniques used

With a minimum of hand tools this puppet can be made in under a day.

A plank of wood is drilled, sawn, sanded and waxed. Thick cord is used to join the parts together. Beads for eyes and feathers are added before stringing the puppet onto a wooden control.

This project introduces many methods that are commonly used when making marionettes. It is aimed at an adult with little or no woodworking or craft-work experience.

A fair amount of detail is given on working with wood, tools and materials. If there are still things that you are not sure about, the internet has videos on the use of saws and drills.

For more experienced makers this is still a great little puppet to make.

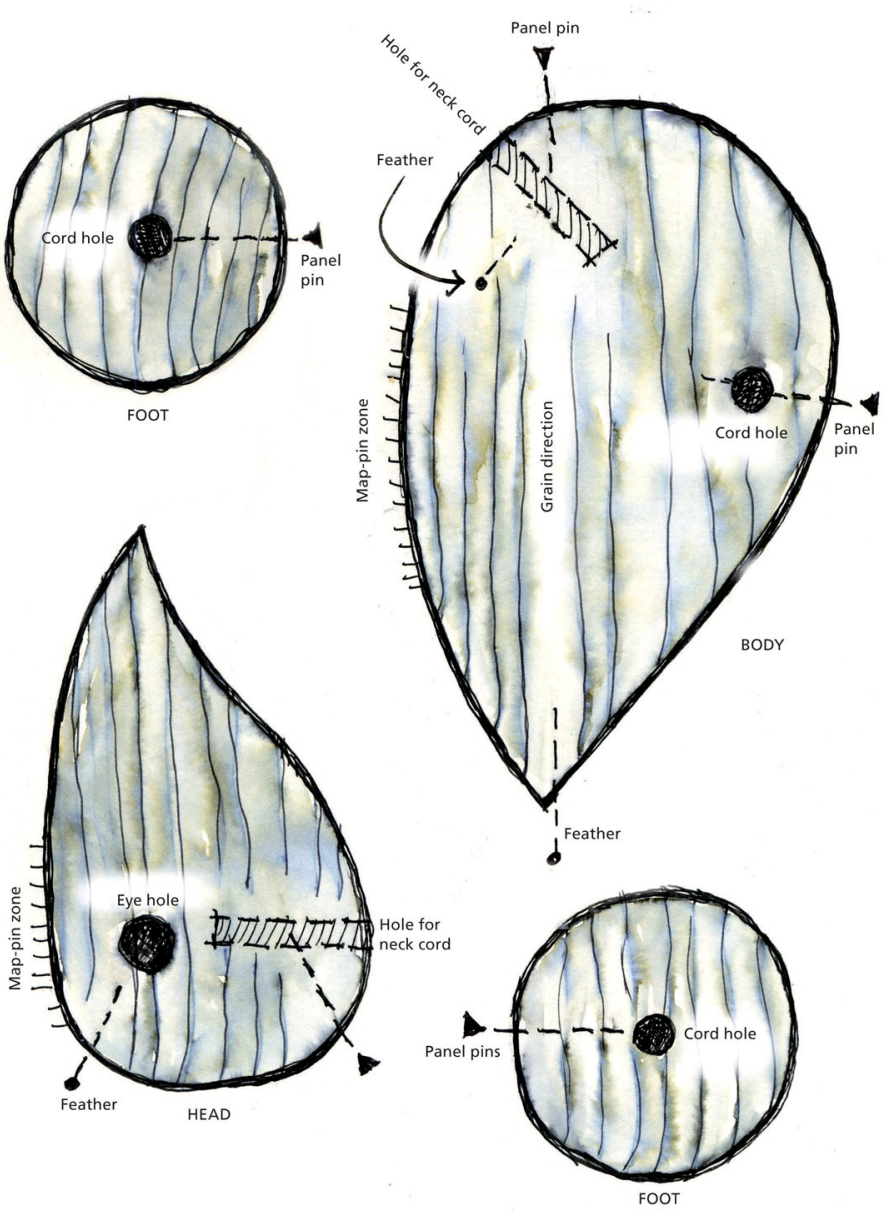
With help and supervision, a child of around ten years old might manage some of the making.

Materials

Materials needed for this project in addition to stock materials.

Buy from timber merchant, hardware, haberdashery and craft shops:

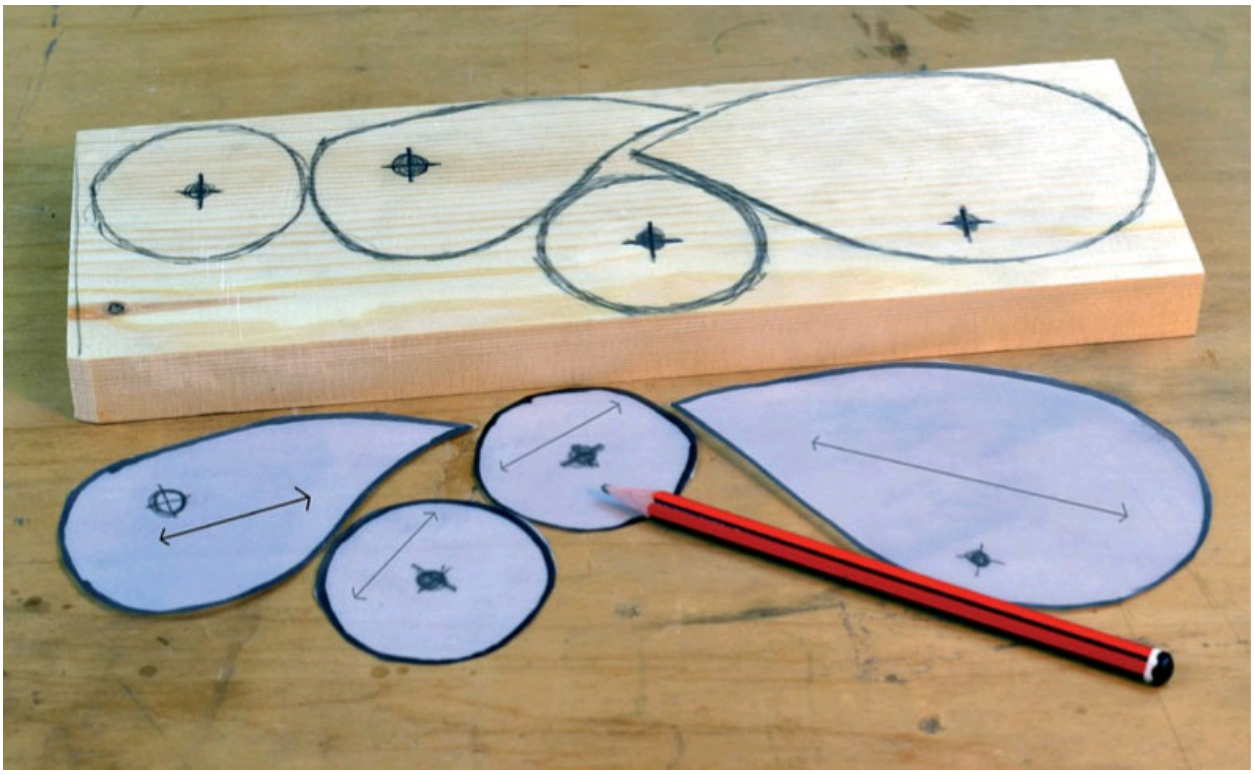
- Plank of wood that has been ‘planed all round’ (PAR), finished size close to 20mm thick x 90mm wide x 270mm long with the grain running along the length. Any soft wood like pine is good. If you want to see the grain of the wood on the finished puppet, choose wood with a strong grain pattern. Make sure the wood has no splits, and only a few small knots.
- Panel-pins. 1.6mm x 30mm. Only five needed.
- Rope/cord: 0.5m length. I have used a 5mm twisted crepe cord, bought from a craft or haberdashery shop, made from viscose/cotton. Other cords can be used, but choose a cord that is very flexible, around 5mm thick.
- Eyes: two buttons with a ‘shank’ at the back with a hole through it. I have used 18mm diameter buttons.
- Elastic: about 20cm of 1.5mm round elastic, any colour.
- Feathers: four coloured feathers, with at least two the same colour. Ostrich feathers have wonderful shape and movement. Buy these from craft shops or on the internet.


Panel pin
Hole for neck cord
Feather
Cord hole
Panel pin
FOOT
Map-pin zone
Grain direction
Cord hole
Panel pin
BODY
Feather
Map-pin zone
Eye hole
Hole for neck cord
Feather
HEAD
Panel pins
Cord hole
FOOT

Materials needed for this project in addition to stock items.

Making

Making the puppet: Step by step



making the puppet – step 1.

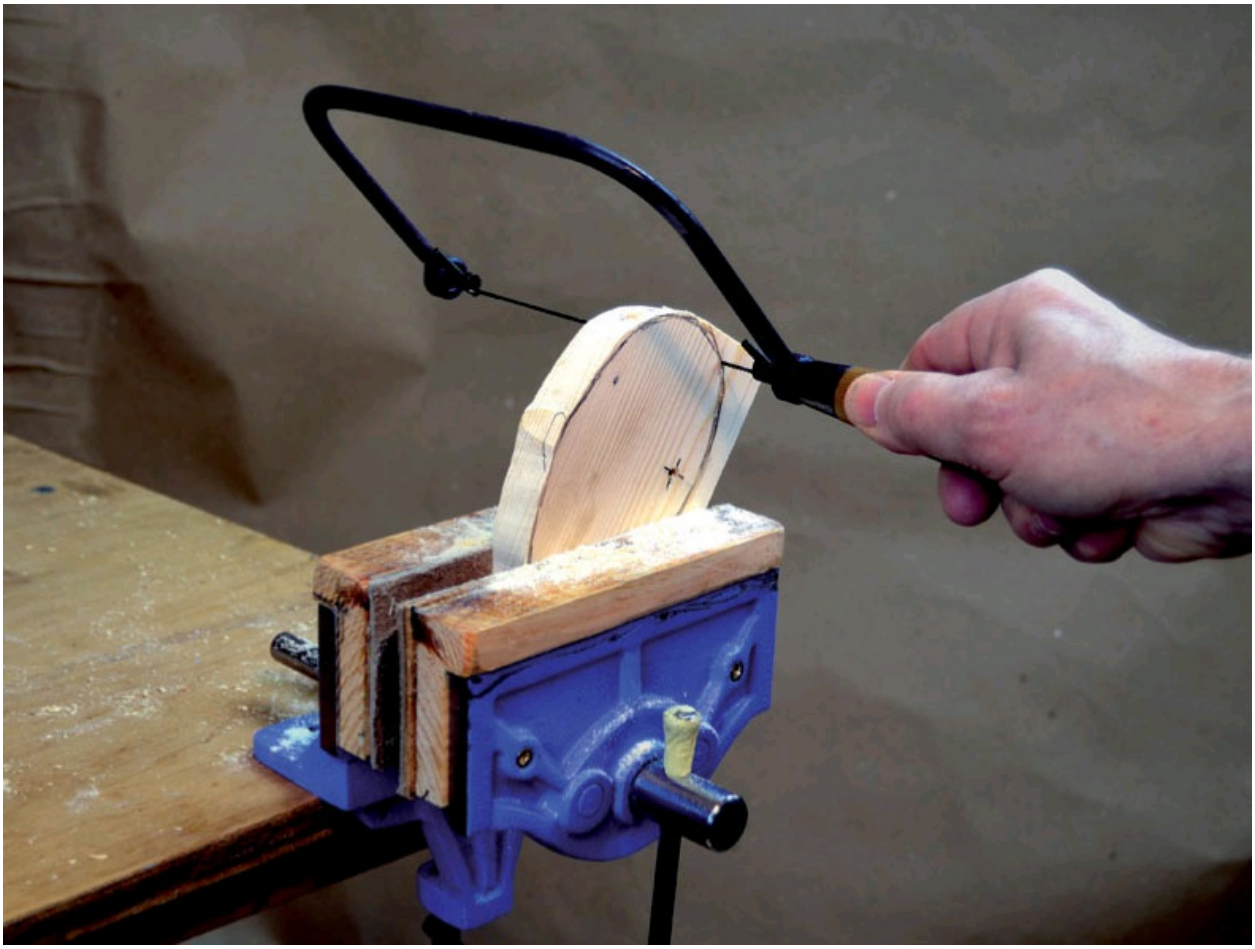
1. From the template, trace onto tracing paper the outlines of head, body and feet. Mark on the tracing grain direction with arrows and positions of holes. You can alter the shapes slightly, but keep the feet round. Cut out the paper shapes and arrange them onto the wood, aligning the grain direction arrows with the grain of the wood. Trace the shapes onto the wood and mark position of the hole centres with a bradawl.

Step 2.

2. Cut the thick cord into two pieces, 18cm for the neck and 30cm for the legs. To stop the cord unravelling, apply UHU glue to 15mm of each end of the leg cord. Then tie a length of linen thread tightly around the glued section, wrapping the thread around the cord, finishing with two half-hitch knots. Rub more glue into the thread. Repeat for the neck cord but make the glue/thread wrap 20mm. Find the mid-point of the leg cord and harden about 15mm of the cord there with glue and thread.

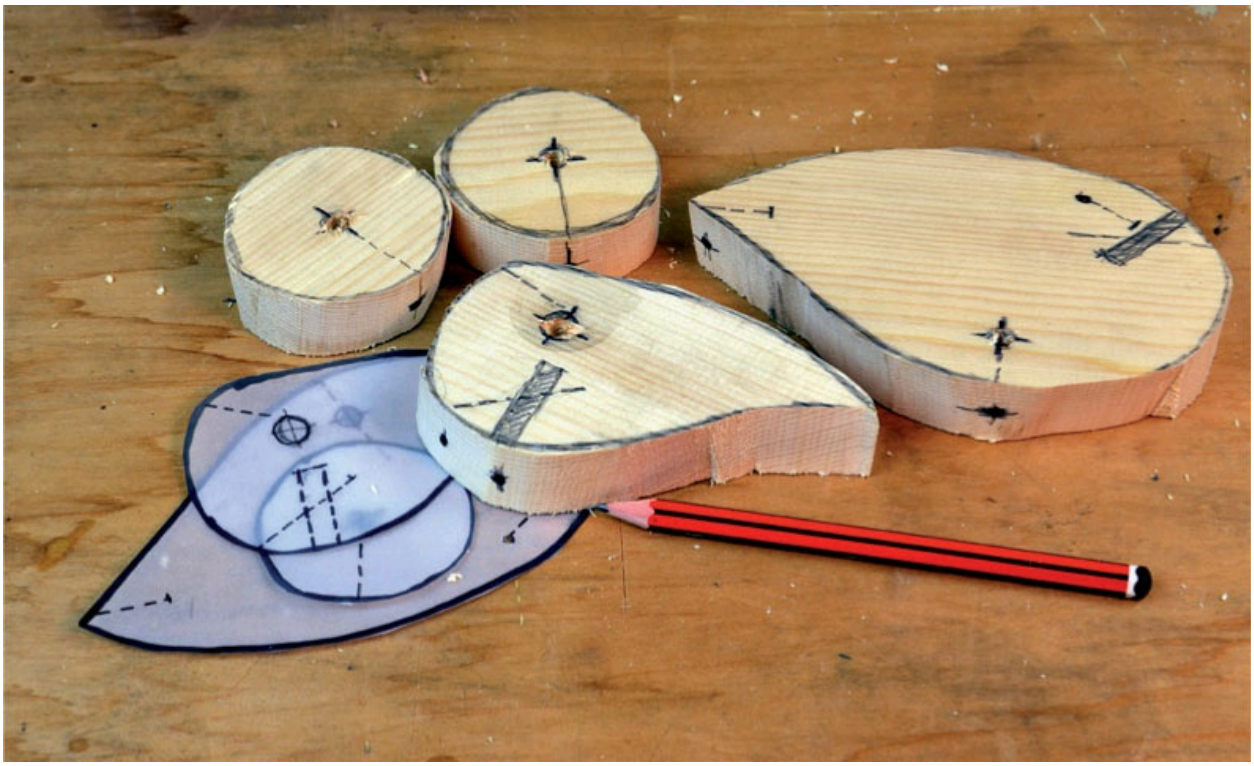
Step 3.

3. Test to see what size hole is needed for the cord to fit snugly, by drilling into a scrap of wood. If it is too tight, use a slightly bigger drill. I have used a 5.5mm drill for cord that is 5mm thick. Clamp the wood onto a scrap of wood while drilling. Drill 5.5mm holes for feet, legs and eyes all the way through the wood. Check if your button's shank can fit into the eye-hole; if not, re-drill the hole a little bigger.



Step 4.

4. Clamp the wood onto your table, with one part of the design sticking out. To prevent damaging the underside of your table, put a bit of thick cardboard under the G-clamp. Saw out the shapes, keeping the coping saw vertical. Use lots of up and down actions, and not too much lateral pressure as the blade is fragile. Some people like to saw with the handle down, others with the handle up. Be careful not to cut into your table or your hands. Re-clamp the wood as you cut around each section, keeping only a small bit of the wood projecting. If the blade of the coping saw breaks, replacing the blade is easy. You will find videos on the internet, look for ‘replacing coping saw blade’. If you have a vice use this instead of the G-clamp.



Step 5.

5. Mark onto the cut-out pieces holes for panel-pins, neck cord and feathers.


12
14
16

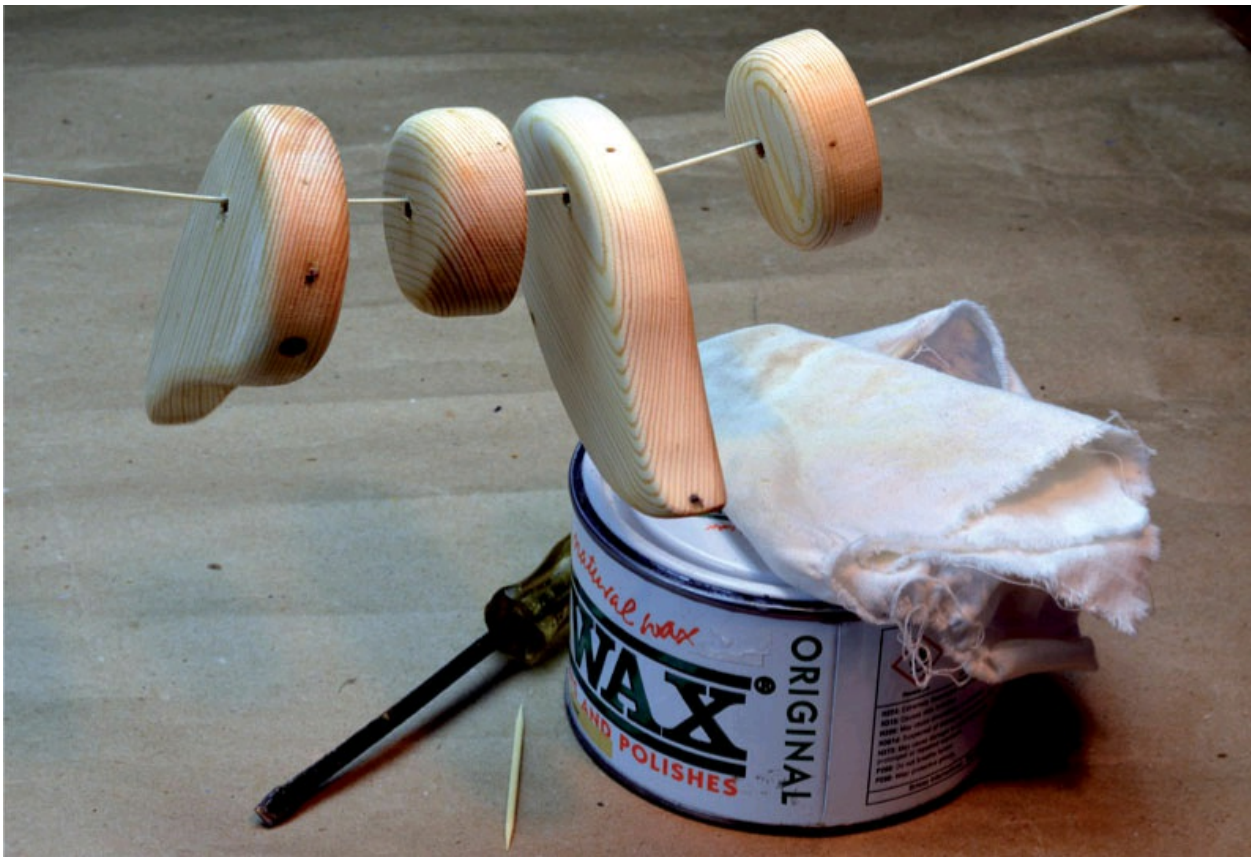
Step 6.

6. For neck-cord holes, put a masking tape flag on a 5.5mm drill bit, 35mm from the end. Clamp the wood to your table and carefully drill horizontally, going only as deep as the masking tape. For panel-pin holes, put a masking tape flag on a 1.5mm drill bit, 25mm from end. (I put my drill bit in the chuck with only 25mm sticking out.) Drill where marked, checking that you have cut across the ‘cord holes’. Also drill 1.5mm holes for head, wing and tail feathers, where marked, angling the wing holes in towards the centre of the wood, going in about

20mm.

Step 7.

7. Use coarse sandpaper to shape the pieces. Remove splinters and round the edges as much as you like. Clamping the wood and using a cork block allows you to sand quickly. Work across the grain to remove wood most efficiently. Be careful not to overtighten the G-clamp, as this can leave dent-marks on the wood. Repeat with medium sandpaper, but work up and down the grain. Finish with the finest sandpaper, without the cork block, working towards the end-grain. Rest the wood on a clean cloth as you work to stop marking.



Step 8.

8. Brush the pieces with a dry toothbrush to remove all dust and any bits of grit. Working on a clean cloth, apply a liberal amount of wood wax polish with a lint-free cloth. Clean out wax from all holes with a toothpick. Thread the pieces onto an improvised ‘washing line’ to harden. To get the wax off your hands, wash with warm water and soap. When dry, polish the wood with a clean rag, to give a slight shine. The wax will bring out the colour of the wood and protect it from getting dirty. Work on a cloth to prevent marking the wood.

Step 9.

9. Thread the leg-cord through the body and push in a panel-pin. If the cord is being held, hammer the panel-pin in fully. If the cord pulls out, pull the panel-pin out using pliers. Drill a new small hole, being careful to go through the cord hole. Try again! Never drill into cord. Attach the feet in the same way. Then do the neck, fixing it to the head and body.

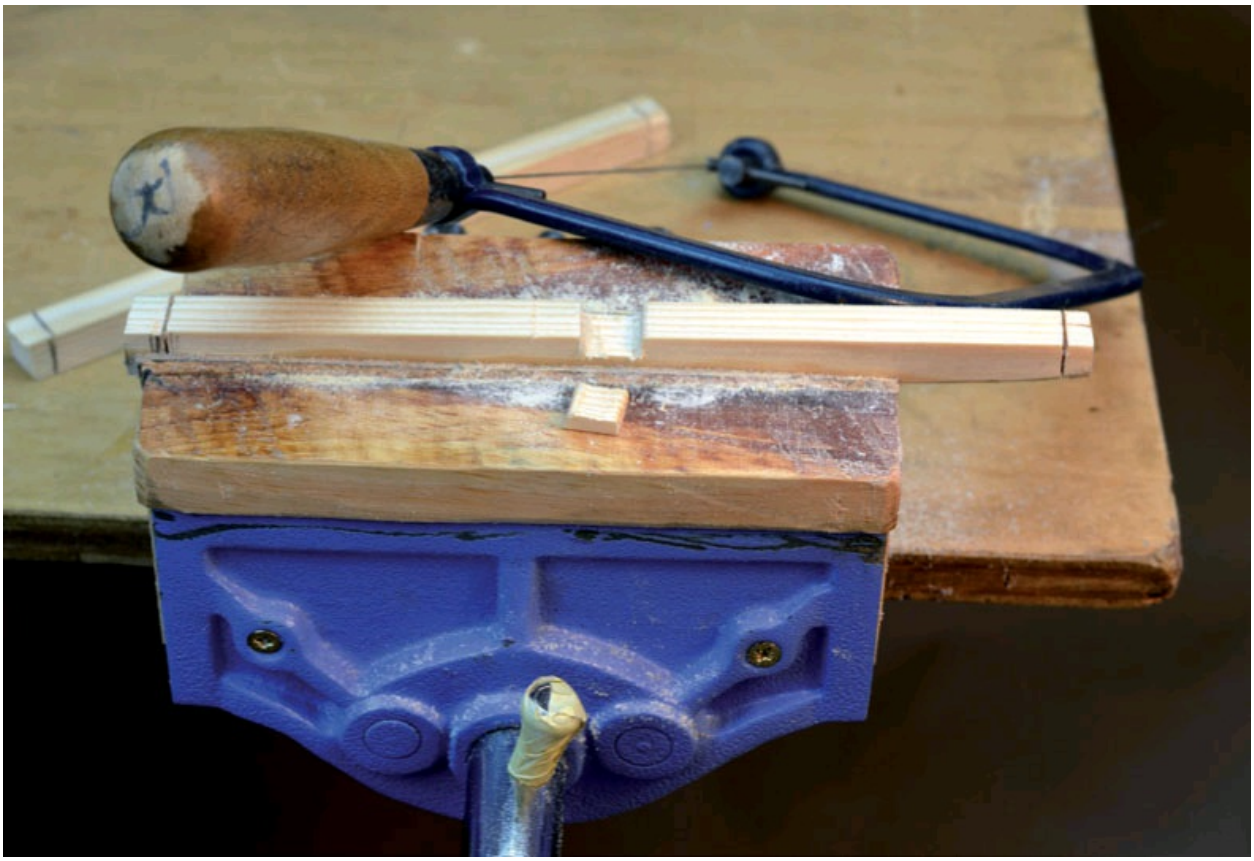
Step 10.

10. Thread elastic through one button's shank, pass the elastic through the eye-hole and tie the other button on with a reef knot (left over right, right over left), pulling the elastic tight before you make the knot, so the eyes are pulled into the holes. Tuck the elastic ends in behind the buttons.

Making the control: Step by step

Making the control – step 1.

1. Cut two 20cm lengths of 14mm x 14mm pine wood, to make bars for the control. Mark a pencil line all around the ends, 1cm from the ends. Carefully saw on the line, cutting in a saw-cut 4mm deep, all the way around. Also saw into the end of each bar, so the cuts are the same orientation on each bar, stopping when you reach the other saw cut.

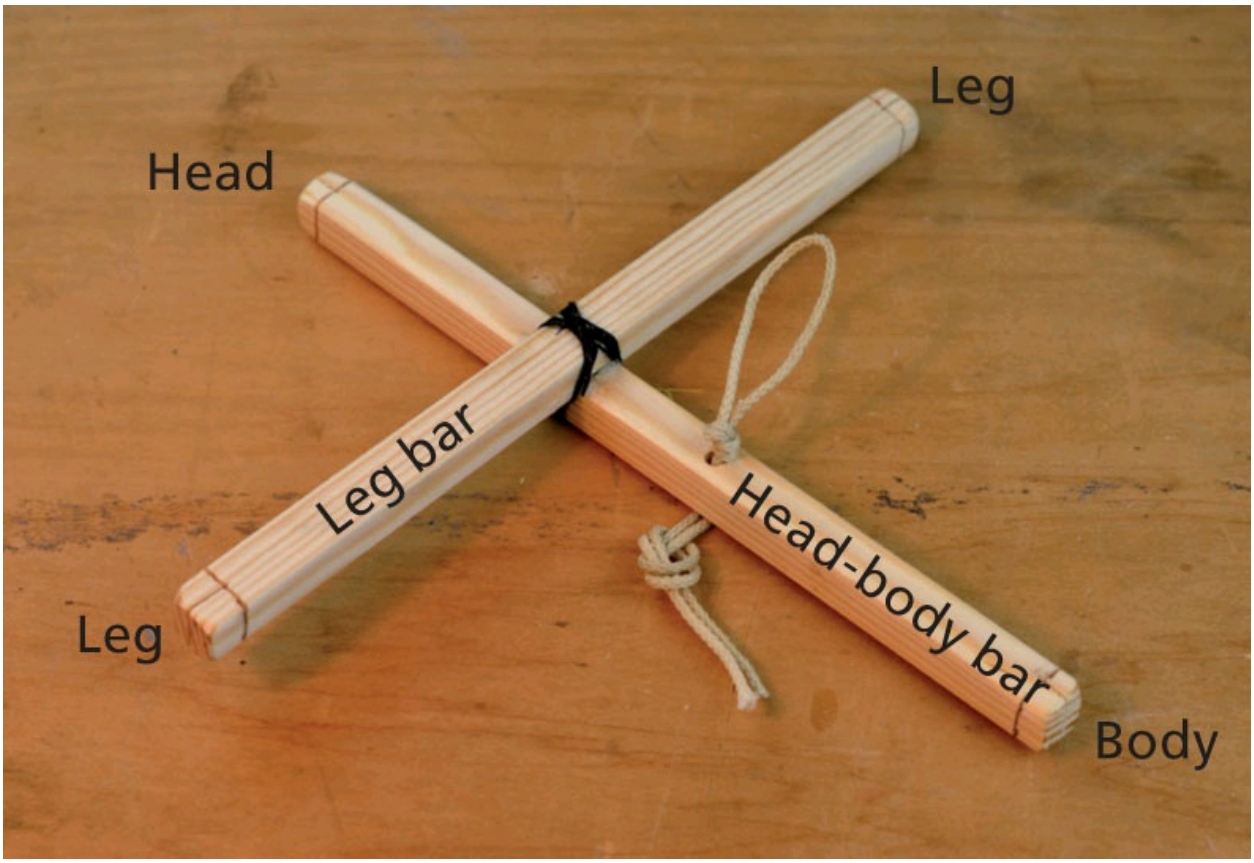


Step 2.

2. Mark one bar as the leg-bar. Mark the other as the head-body bar. At the centre point of the leg-bar, mark the thickness of the head-body bar, so they can be notched to fit together. Make sure the saw cuts on the ends of the leg and head-body bars are all vertical. Saw a small section out of the leg-bar 4mm deep.

Step 3.

3. Sandpaper the control to smooth off sharp edges. Slot the leg-bar on top of the head/body bar at 7cm from an end. This end will be the head end. Glue the two bars together with UHU, and bind with thread in a figure 8. Make sure the bars are at right angles to each other and all the end-slots are vertical.



Step 4.

4. Drill a 4.5mm hole vertically through the body-bar 3cm behind the head-bar. Tie a loop in 2mm cord, pass the ends through the hole and tie a knot below the bar, pushed up as tight as you can. Trim the ends of the cord and dab with a little glue.

Stringing the puppet: Step by step

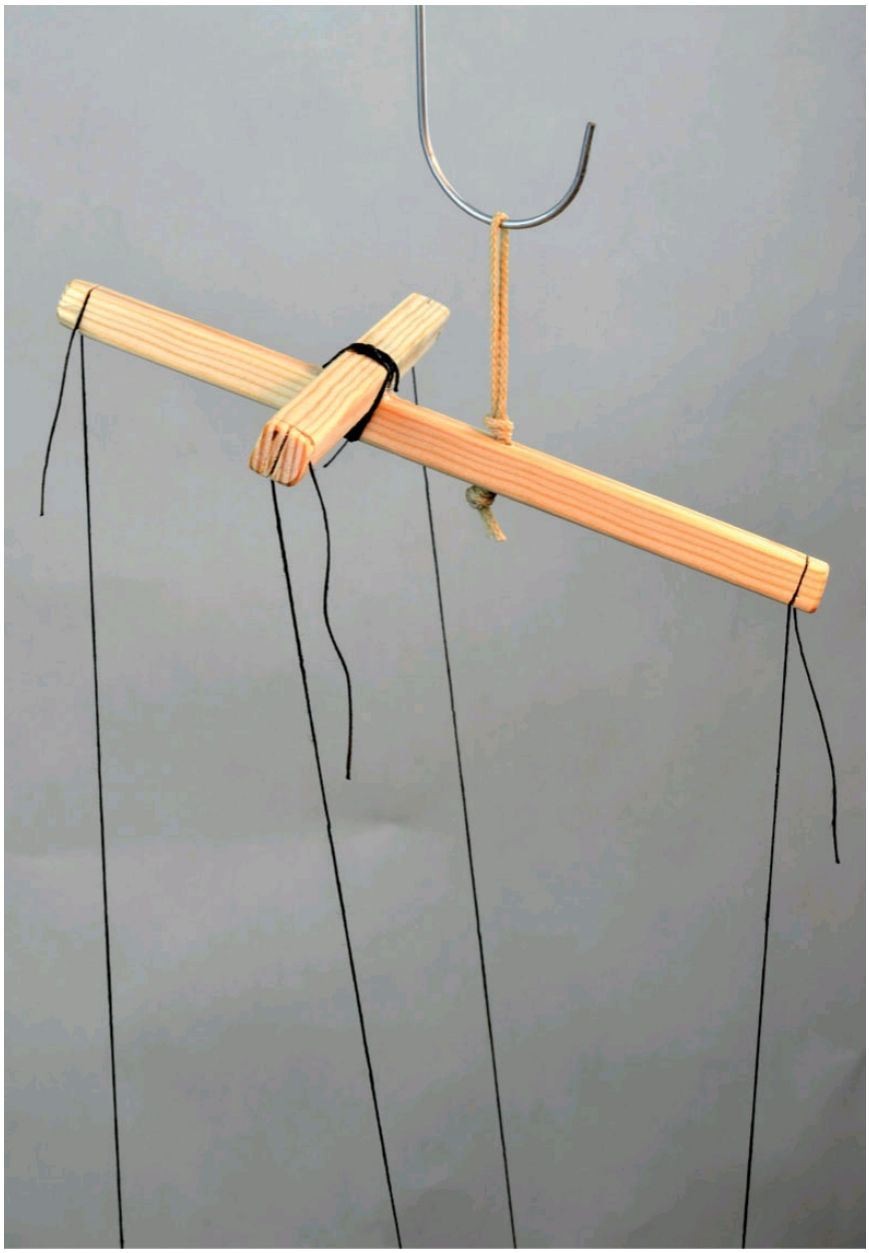
Stringing the puppet – step 1.

1. To balance your puppet, some testing needs to be done. Push mappins into the head and into the body somewhere in the mappin zone marked on the template drawing. Hang the control from a hook in your ceiling. Cut two lengths of linen thread, each about 50cm. Make a single loop at the end of each thread. Hang your puppet from the mappin in the body with one of the loops. Attach the thread to the control by running the thread up through the vertical slot at the back of the control, and wrapping the free end around the side saw-cut slot a few times.

Repeat with a thread from the head. Test out the puppet's movement. Remove the puppet from its hook and tilt the control so the head dips to the floor and try pecking. Move the mappin in the head until you get a good movement. Moving the pin in the body will affect how the puppet sits and stands. Mark the best mappin positions with a pencil.

Step 2.

2. Remove the threads and take the mappins out of head and body. Bradawl into head and body where you have marked the best positions. Screw in a screw-eye at each point. With two new threads each about 50cm long, tie onto the screw-eyes using a full knot (two half-hitches). Tie 70mm long threads tightly around the leg-cord just above each foot with a full knot. Decide how far below the control you want the puppet to perform. A good distance from body screw-eye to control is 40cm. This allows the puppet to walk on a chair or the floor quite comfortably. The longer the threads, the trickier the puppet will be to control. Start with the body string, tying it to the control. Then attach the head thread. Next, run the leg strings up to the control and tie them off with the leg-bar horizontal, so the threads are just taut without lifting the legs. Test out the movement. If all is good, trim the ends of the threads, leaving the ends about 1cm long at the puppet and about 5cm at the control.



Finishing

To prevent the puppet slipping about when walking, some leather is glued under the feet. Trace around the feet with a ballpoint pen onto thin leather. Cut the leather slightly smaller with scissors and glue on with UHU.

Decide how long the feathers should be. Cut them, allowing about 20mm extra length to go into the holes. Test out the puppet's movement to check

if the feathers need to be shorter so they do not interfere with the strings, and when happy, glue the feathers in.

Your Walking Bird is complete!

The completed puppet.

The puppet has a wide range of movements.

Performing

This puppet is simple to bring alive.

Try the puppet sitting, standing still, looking around, walking, pecking, jumping and dancing. A small box is a nice prop for the puppet to stand on, hide behind and jump off. Set a mirror so you can see what the puppet looks like from an audience's viewpoint.

Never drop the control onto the puppet as the strings will get tangled. Store the puppet hanging up, or if you need to put it in a box, put the puppet in a fabric bag, like a pillow case, and wrap the strings around the outside of the bag.

If the puppet gets tangled, simply untie one or both leg strings from the control.

A child under eight will struggle to fully coordinate this puppet's movements.

Very young children will love watching and 'feeding' it. Do not let them touch the puppet or grab the strings.

Alternatives

Instead of a waxed finish to the wood, you can use a clear or coloured varnish or paint. Artist's acrylic paint will work perfectly.

The size, shape, and materials for this puppet can be altered while still keeping the basic design principles: a simple control, long flexible legs and neck, with weight in the body, head and feet.

A seashore themed bird puppet made from driftwood, shells and found feathers.

CHAPTER FIVE

PROJECT 2: A DANCER

The Dancer is a rod-marionette that is very easy to perform.

This puppet is all about soft, flowing movements that come from the fabric skirt, flowing hair and flexible joints.

The puppet's height is 47cm.

The finished Dancer puppet.

Techniques used

This puppet can be made over about five to seven days. The process cannot be rushed as parts need time to dry.

The head is modelled in clay or plasticine, which gives you total freedom to add after and take away until you are happy with the form. The clay is then covered in layers of glue and paper. The body has a core of plywood,

joined by rope and shaped using scrunched paper. Hands are modelled in an oven-hardening polymer clay over a wire armature. The puppet has no legs. It has a fabric skirt and a wig.

This puppet is perfect for anyone who enjoys working with clay, papier mâché, paint, fabric and threads. There is a little simple sawing, drilling, sanding and working with wire.

This is a more complicated puppet to make compared to the Walking Bird, needing more time and a bigger range of materials.

The finished puppet is the easiest of the three puppets to perform.

Parts of the puppet can be made by a child but an adult will need to guide and do much of the making.

Additional kit

Needed in addition to stock items and stock tools:

- Small pliers with narrow, flat jaws.
- Craft knife with a narrow, long blade.
- Paint brushes. Three sizes: fine, medium and broad, about 3mm, 10mm and 13mm.
- Teaspoon and modelling tool. I like a wooden modelling tool with one end round and the other knife-like.
- Plastic sheet to work on.
- Glass jar or tin used as a modelling stand.
- Container for soaking paper in hot water.
- Three jars or plastic pots for water, paint and glue.
- Pallet to mix colours. I have used a plastic takeaway lid.
- Spatula for applying filler: a scrap of wood, card or plastic.
- Cling film.
- Paper tissues/towels.
- Two bamboo kebab sticks.
- Scissors for fabric.
- Sewing needles.
- Dressmakers pins.
- Thimble.
- Corrugated card, about 10cm x 18cm.

- Dowel rods in hard or soft wood:
  - About 20mm diameter x 13cm as a rolling pin, or use a rolling pin or anything round!
  - 12mm diameter x 20cm. For modelling head on.
  - To match diameter of chosen eyes. I have used 8.5mm diameter x 80mm. You can sandpaper one end of a dowel to the right size.
- Scrap block of wood, about 40mm x 50mm x 50mm.
- Nice to have: A4 sheet dark card.
- Apron to protect your clothes.
- Hand cream. Your hands will get rough when using sandpaper, and you want to have smooth hands when working with fabric.

Use of:

- Warm water, basin/bucket and washing powder/liquid.
- Oven to bake the polymer clay hands and neck.
- Oven gloves.
- Iron and ironing board.
- If you can use a sewing machine, it will speed up making the costume.

The following is needed for this project and Project 3:

- Six dress-making pins with large heads.
- Thin cardboard at least 10cm x 20cm. Card from a cereal box is ideal.
- Craft knife with wide, long blade.
- Marker pens: black, permanent, fine and medium.
- Box of matches.

Additional kit needed.

Materials

Needed in addition to stock items:

Keep all offcuts for Project 3.

- Dowel in hard or soft wood: 9mm diameter x 30cm. For arm control and neck modelling.
- Plywood: 4mm x 14cm x 14cm.
- PVA wood glue about 500ml. Use good quality glue, not the cheapest.
- Filler: ready-mixed or in powder form. Polyfilla or equivalent. (Spackle in USA.) A small amount.
- White emulsion paint: a small pot of household matt paint.
- Cord: polyester or nylon, braided very flexible, any colour. 3mm x 1m, 4mm x 2.5m.
- Clay, plasticine or other putty-like modelling material. 1kg. Light colour.
- Sculpey, Fimo or other polymer clay that hardens when baked in an oven. One 57g block, light in colour.
- Artist's acrylic paint: a small tube each of black, white, yellow, red, blue

and brown. I have used Payne's grey, titanium white, cadmium yellow, cadmium red, Prussian blue, and burnt umber.

- Florist wire: 20swg (0.9mm) at least 14 lengths, each 30cm long, sometimes called stub wire. Buy from a florist or online.
- Brown paper: 'parcel paper' with subtle stripes within the paper. At least 50cm x 2m.
- Newspaper.
- Eyes for puppet: beads, rhinestones or anything shiny. About 5mm to 10mm in diameter.

Additional materials needed to make the puppet.

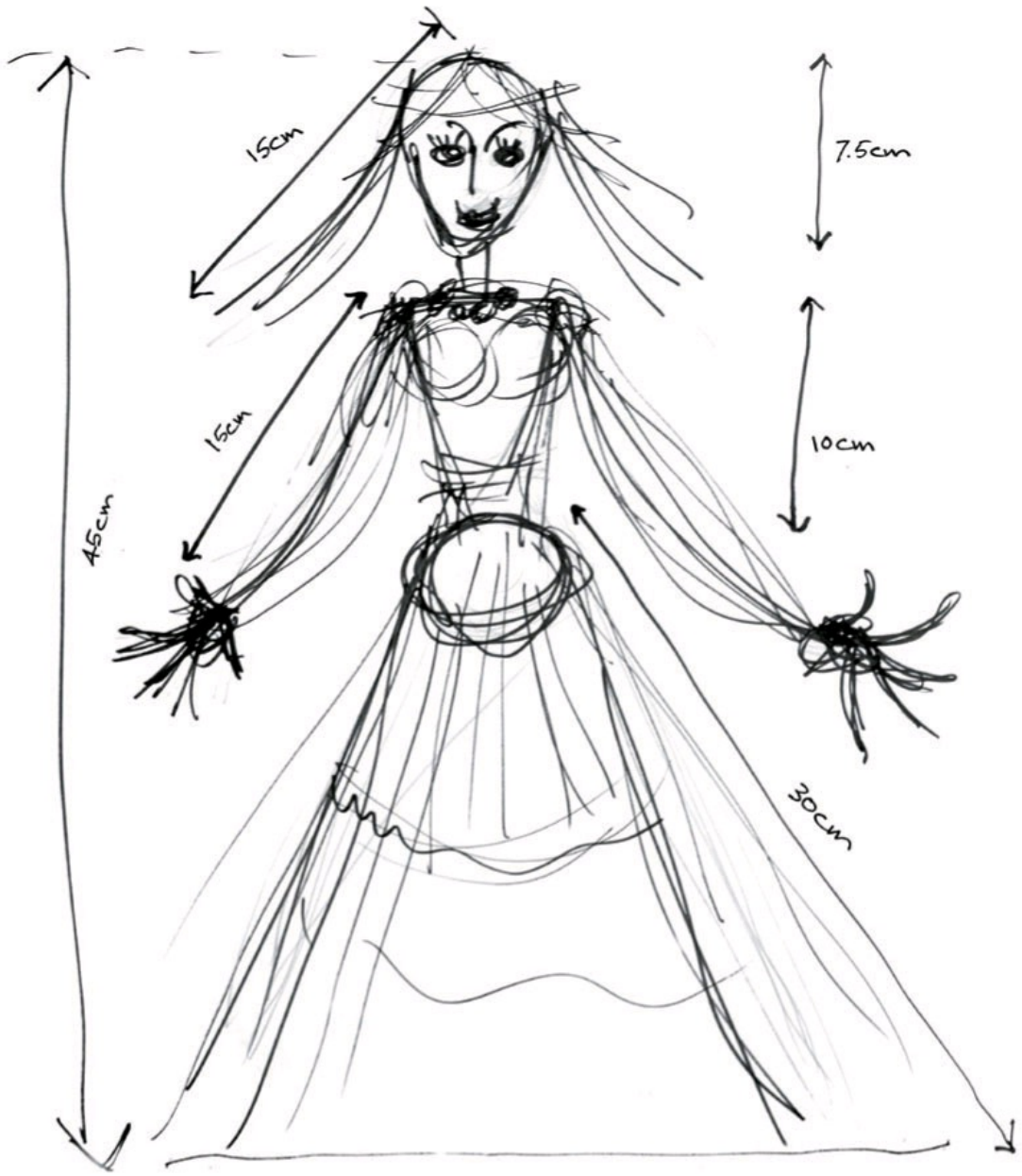
A selection of beads, buttons, and nails for use as eyes.

Materials for costume and wig.

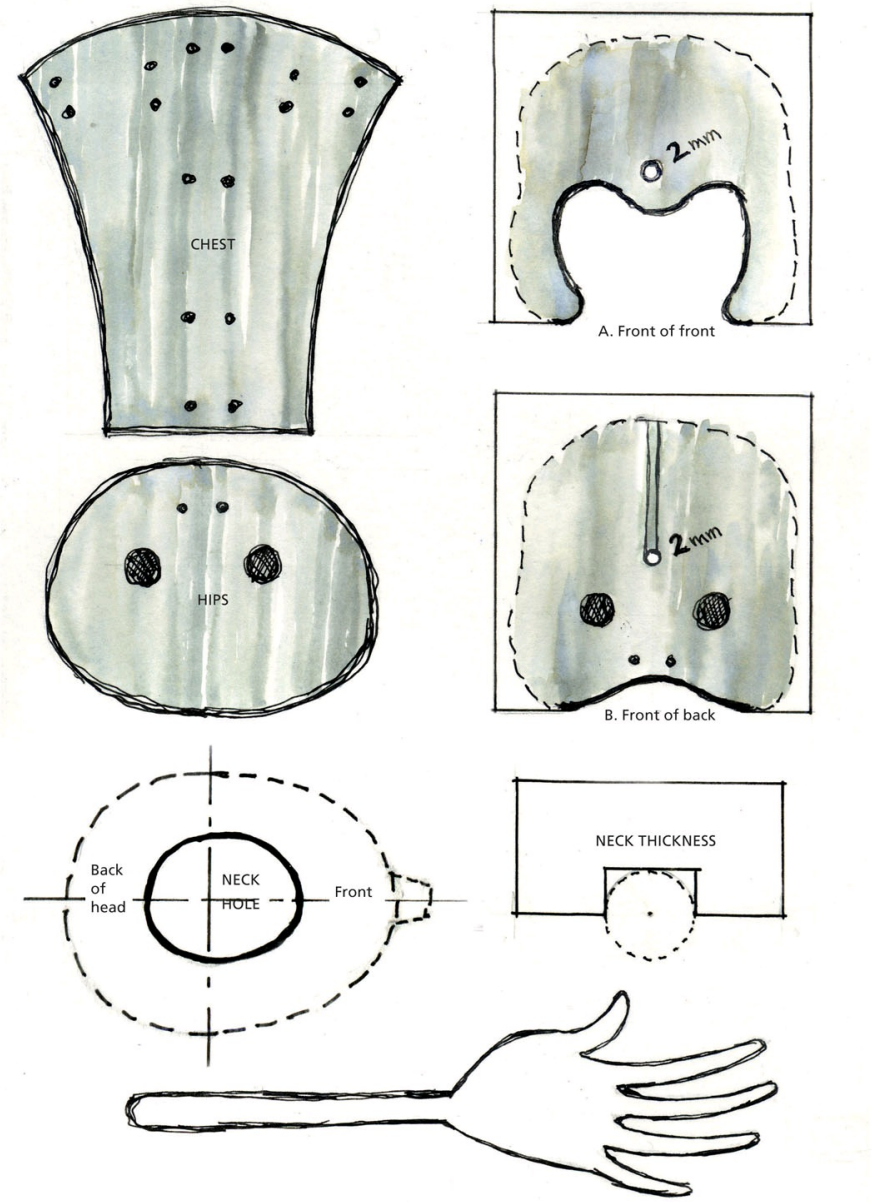
Costume and wig materials:

- Medium weight fabric for dress at least 70cm wide x 70cm. We have used a silk fabric. Silk or viscose make soft fabric that will drape well. A ‘silk mix’ fabric is fine.
- Medium weight fabric for a contrasting coloured band around skirt: at least 25cm wide x 1m. We have used a silk fabric.
- Light-weight, see-through fabric for overskirt: at least 85cm wide x 50cm, for example chiffon, georgette, or muslin.
- Narrow trim, about 6mm x 2m.
- Wide trim, about 12mm x 5m.
- Sewing thread, to match dress materials and trims.
- ‘Bling’ of your choice to decorate the overskirt: stick-on or iron-on diamanté, sequins and so on.
- Wig making materials: about 75 metres of mixed embroidery threads and rayon ribbon. We have used five different thread types and colours to bring variety.

Making



The Dancer puppet started with a quick sketch to decide size and rough shape.



Make the head: Step by step

Make the head: Step 1

1 Model head from plasticine or clay. Plasticine is cleaner to use, re-usable and not expensive for the quantity needed. I have used clay as I find it easier to shape, but it is a personal choice. Form a lump of clay about 65mm tall, 50mm wide and 60mm from front to back. Push a 12mm x 20cm wooden dowel into the clay as a neck and holding stick. A big blub of clay in a jar acts as a stand. Use your fingers, modelling tools or a teaspoon to push, scrape and pat the clay into a head shape. With the neck stick vertical, have the head looking up slightly.

Use black card to view the head against. Make the head symmetrical when seen from the front, and make the chin well below where the neck joins the head, as otherwise the neck joint will be visible.

Step 2.

2. Add on a nose, and press in to make eye hollows. Mark positions of eyes and mouth. Make the shapes bold and clear, as the forms will be softened when paper layers are glued over the clay. Do not add too much detail as this is very difficult to papier mâché. If you need to take a break for a few hours or even days, cover the clay in cling film to prevent the clay drying out. Start smoothing the forms. I use sandpaper to clean my modelling tool.

Step 3.

3. Try out different beads and buttons as eyes. Press them into the clay to see how they work. I have used some mirror-backed 8.5mm diameter beads. Check what the head looks like from front, side and three-quarter view. Remove the eyes and store them somewhere safe. Smooth the head using water applied with a paintbrush.

Step 4.

4. Tear brown paper into hand-size pieces, removing any cut edges. Soak about five pieces in boiling water for a few minutes. Dilute PVA glue with a little cold water to a single cream consistency. Paint the whole head with glue. Remove one piece of paper from the water. Squeeze all the water out. Working on a plastic sheet, paint glue onto both sides of the paper. The paper should now be very soft. Tear off small bits of paper and press onto the head, adding more glue as needed. Cover the head with overlapping bits. Use small strips over the nose and into

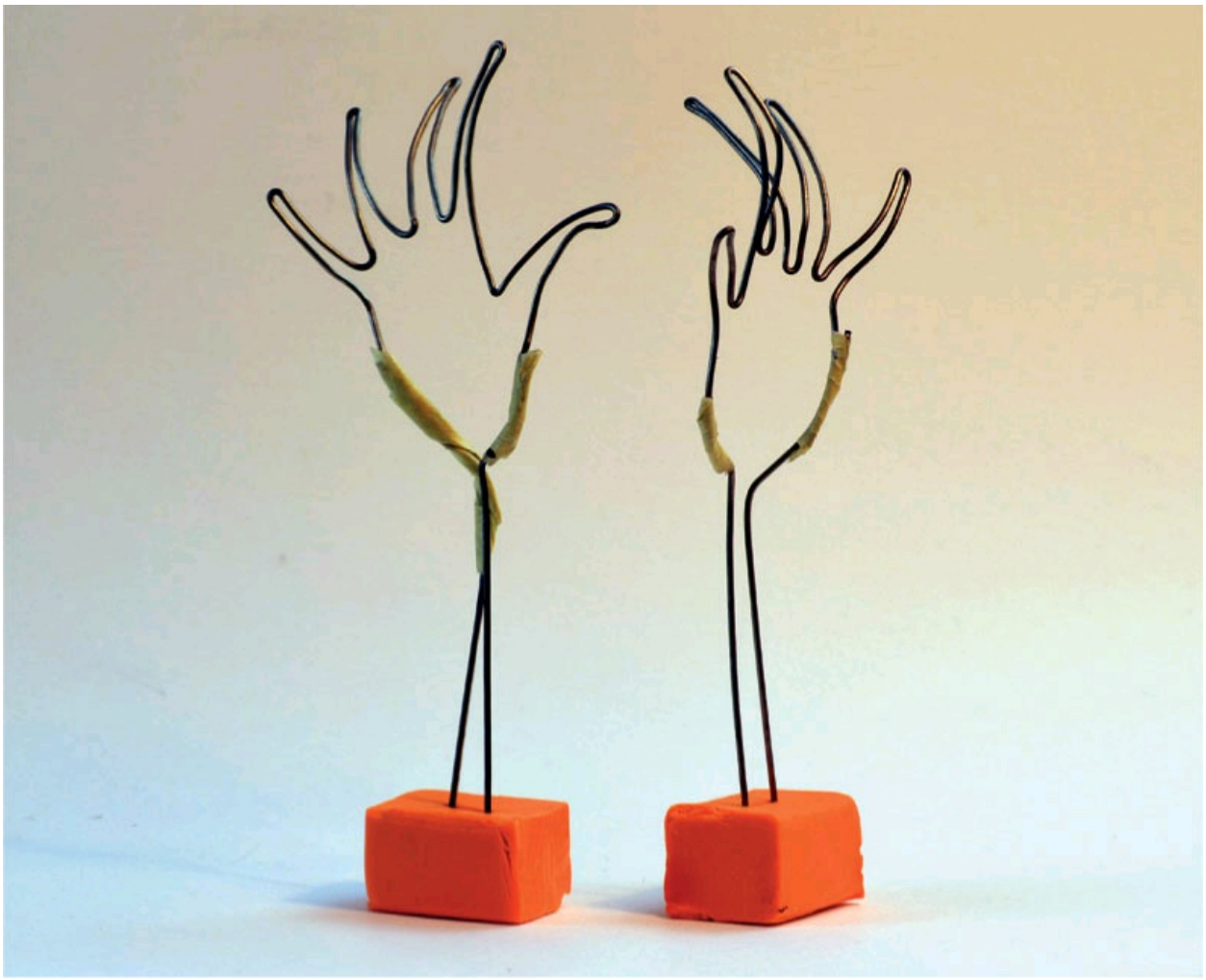
the mouth. Use a dowel that is sanded down at one end to the diameter of your chosen eyes, to redefine the eye holes; check the eye-beads fit snugly. Use a sharp pencil point to press into the mouth. Cover your diluted glue with cling film, as you will be needing it again. Allow glue to dry a little, then rub the head with a spoon to flatten the paper layer as much as possible.

Step 5.

5. When fully dry, sand the head with medium sandpaper. Scribble all over the head with a permanent marker. This will make sure when you add more papier mâché, you fully cover all parts. Add another three layers of papier mâché, allowing the head to dry fully between each layer and sand it each time.

Make hands: Step by step

Step 1 – equipment.



Step 1.

1. Trace the hand shape from the template. Bend a length of florist wire (about 30cm) in half. Place the bend on the tip of the middle finger of your tracing. Using narrow pliers, bend wire to follow about 0.5mm inside the drawing. You will run out of wire near the wrist. Cut a length of wire in half with larger pliers, and join the wire onto your wire hand, with some thin strips of masking tape, wrapped around the wires. This is formed into a handle which becomes the forearm. Repeat with the other hand. Bend the fingers into an interesting posture. Make sure you have a left and a right hand. Be careful to keep the wire just inside the hand drawing.

Step 2.

Step 2 – equipment.

2. Knead some Sculpey, Fimo or other polymer clay till it is soft. For the outside of the hand, roll out a piece between cling film, till it is about 1.5mm thick. Press the wire hand into the clay and trim away excess with scissors and a craft knife. Repeat the process for the other hand.

Step 3.

3. Roll out another sheet of polymer clay for the inside of the hand. Cut away the excess and add a lump to the palm of the hand. I use the sharp end of a bamboo kebab stick to refine the shapes, and a kebab stick whittled into a flat blade shape, to get in between the fingers. Dipping the sticks into water will smooth the clay. Make sure none of the wire frame is exposed.

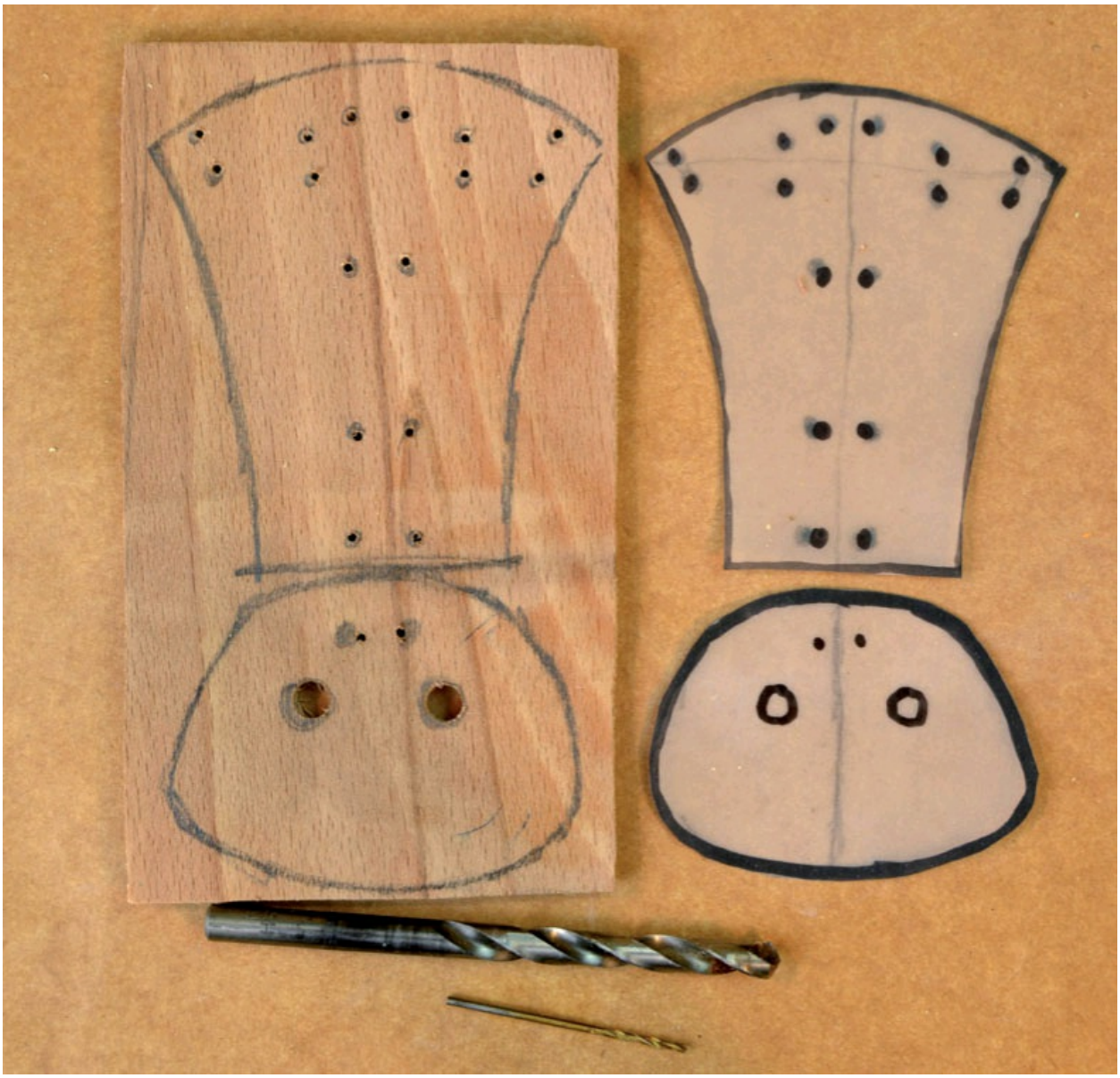
Step 4.

4. Push a large pin through the hands near the knuckle of the index finger, and near the wrist. Enlarge the holes using a bit of florist wire. Test that the linen thread can be threaded through the holes, but a double knot in the thread will not pass through.

Step 5.

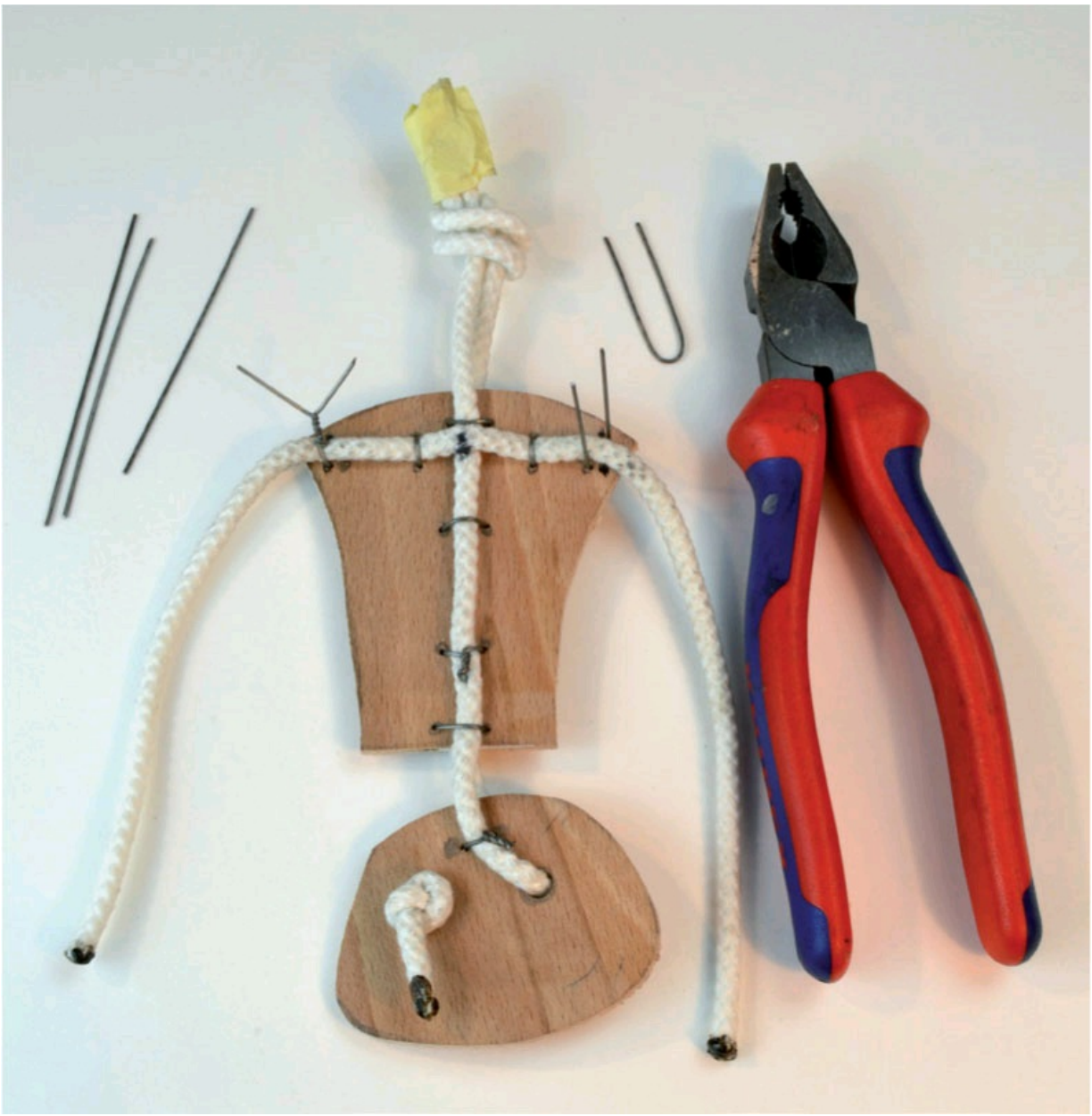
5. Pre-heat an oven to the temperature specified by the polymer clay you are using; this will range from 110 to 130°C. Place the hands in the hot oven, hanging them from wire hooks hanging from oven racks. Remove after fifteen to thirty minutes. Again this will vary with the clay used. Leave to cool fully. Sand the hands with medium and fine sandpaper. You can use a craft knife to shave away bits of the clay.

Make body and arms: Step by step



Make body and arms – step 1.

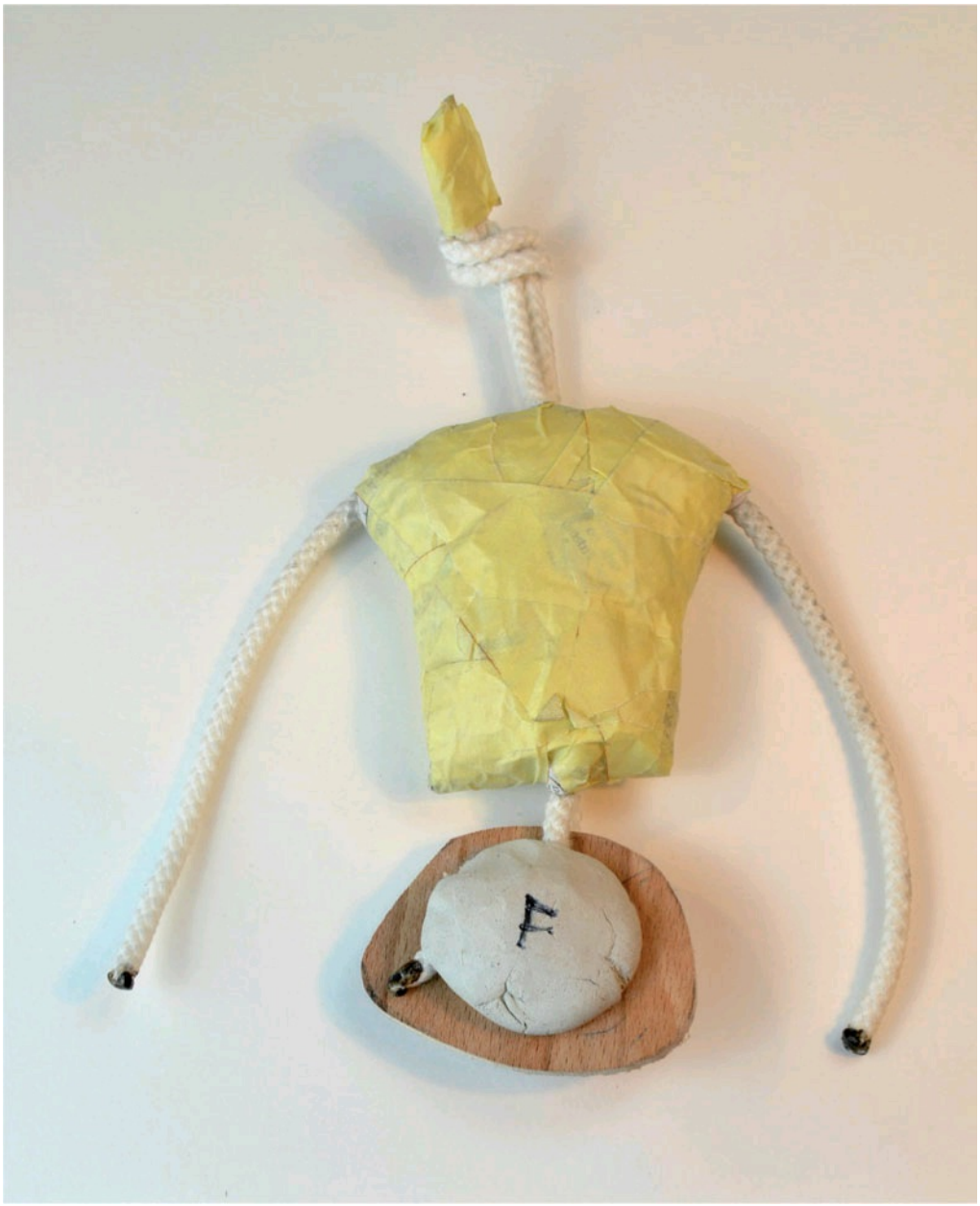
1. Trace CHEST and HIPS from the template and transfer to thin plywood. Ply is extremely strong because of its construction of layers of wood with the grain running in different directions. Drill 5mm and 1.5mm holes through the ply where marked. Cut shapes out with coping saw, and sand the edges smooth.



Step 2.

2. Cut 4mm cord into two lengths of 40cm for the spine, and one 36cm length for the arms. To prevent the cord fraying, light each end of a cord till it melts and as it cools, roll the end between two scraps of wood. Be careful as the melted cord can burn you badly. Knot one end of a spine cord. Push the cord through a pelvis hole and lay it up the centre of the chest ply. Flip the body over and repeat with the other cord running up the other side of the ply. Cut some florist wire into short lengths, each about 50mm, and bend into long staples. Push a staple

through the small pelvis holes, capturing both front and back cords. Twist the arms of the staples together with pliers. You want to tighten enough to pull the wire into the cord, but not so much that the wire snaps. Cut off excess wire and fold the wire down. Leave a 10mm gap between pelvis and chest. Fix more staples along the spine cords. Mark the centre of the arm cord. Position the mark on the spine and use staples to secure the arms.



Step 3.

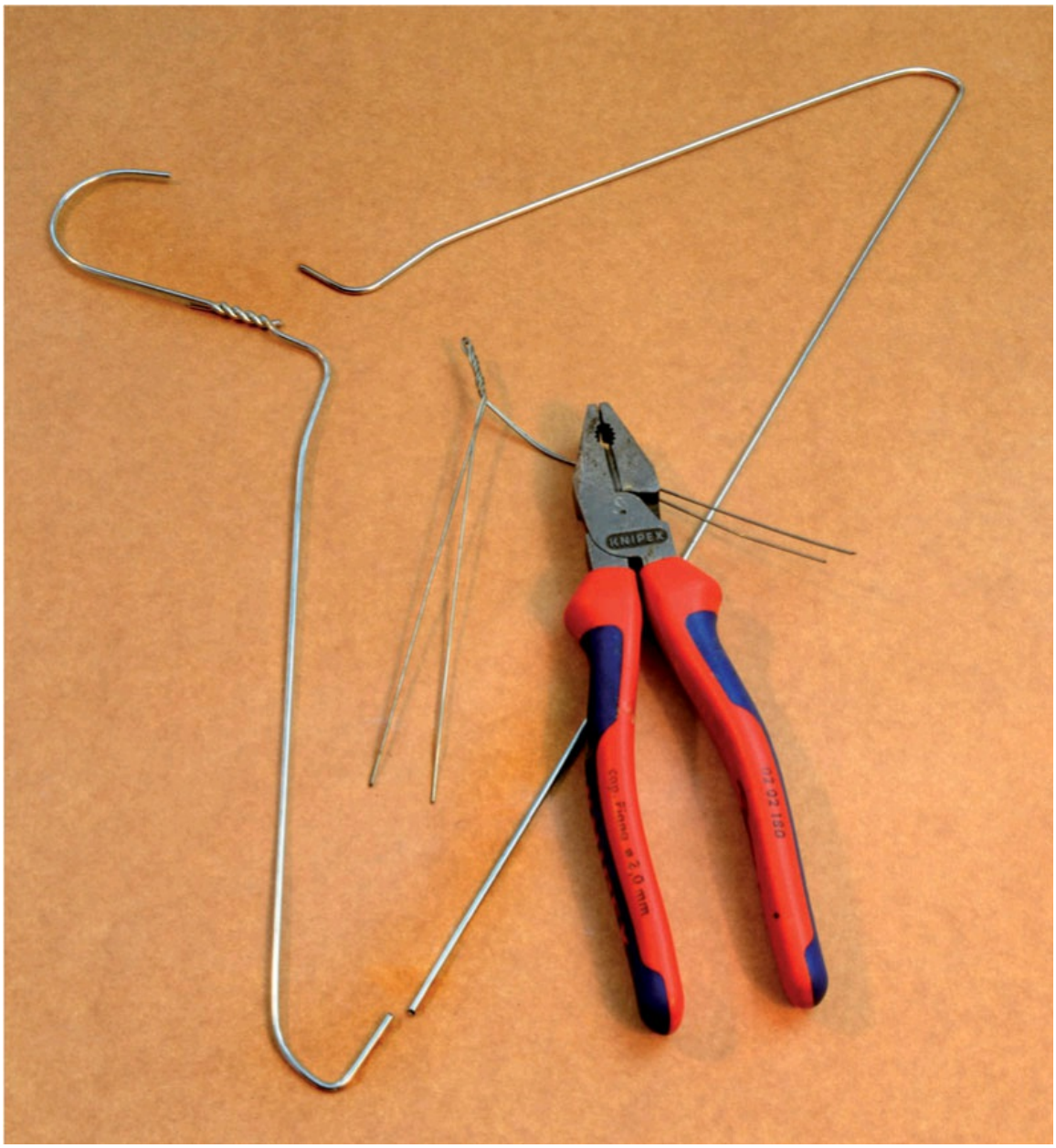
3. Scrunch some newspaper and tape it to the chest ply. Work on the front first. Build up the shape till you have a chest form without breasts. Cover with tape, rubbing it smooth. Be careful not to add much paper around the edges of the plywood. Press a lump of clay onto the pelvis, so it sits flat on the plywood. Remove the clay and let it dry in a warm place. Repeat with a lump of clay for the back of the pelvis. These bits of clay act as weights to give good movement to the puppet. If you have plasticine, use this as weights, as you will not need to pause for it

to dry. Flip the puppet over and shape the back of the chest with newspaper and tape.

Step 4.

4. When the clay weights are dry tape them (or use plasticine) onto the pelvis and cover in scrunched paper and tape. Build up each breast by rolling some paper into a ball and taping it to the chest. Measure the waist circumference using a scrap of paper. This needs to be 150mm to 160mm. Build up more paper and tape if it is less than this. If it is much bigger use a sharp craft knife to cut some paper away at the sides, and then re-tape. Cover the chest and pelvis with a rough layer of glue and brown paper.

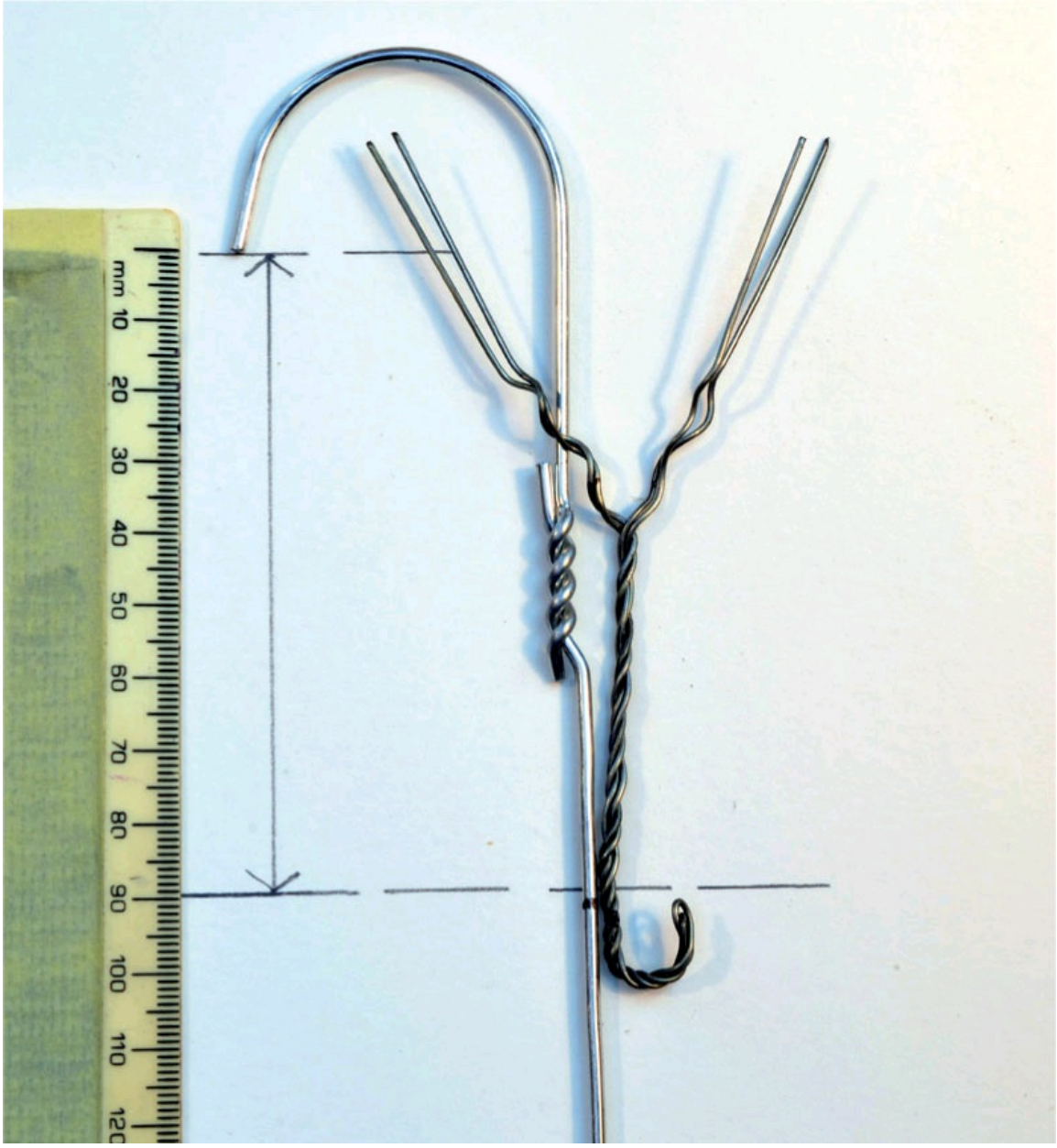
Make control: Step by step



Make control – step 1.

1. Work out which part of a wire coat hanger's hook is continuous with the rest of the hanger, and which bit is twisted on just below the hook. With pliers, cut off the non-continuous wire, as close to the twist as possible. Cutting through such thick wire with pliers can be difficult. Press hard

on the pliers to make a groove in the wire, then bend the wire at the groove, and it should snap in two. Cut off the horizontal section about 20mm from a corner, as shown. Put two 30cm lengths of florist wire together, fold in half and twist the four strands together for about 10cm.

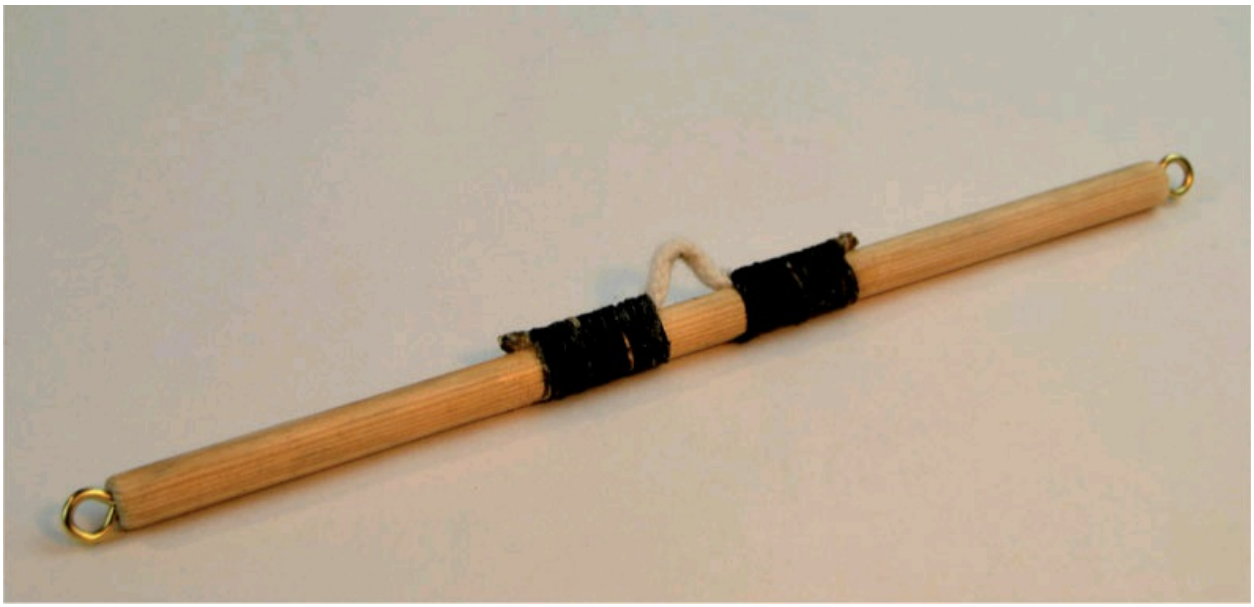


Step 2.

2. Use pliers to straighten the coat hanger wire below the twisted section, all the way to the end. Use a hammer to straighten any kinks out. Form a hook in the twisted florist wires, and place the wire against the coat hanger so that the little hook is pointing up, 90mm below the big hook. Mark this position with a permanent marker.

Step 3.

3. Twist the thin wire around the thick wire just above the twisted section and cut off excess wire. Wrap this in masking tape. Spread undiluted PVA glue on the tape and wrap 3mm cord around the wire to form a handle. Tie the end of the cord off as a half-hitch, and rub more glue over the cord. When dry, trim off excess cord.



Step 4.

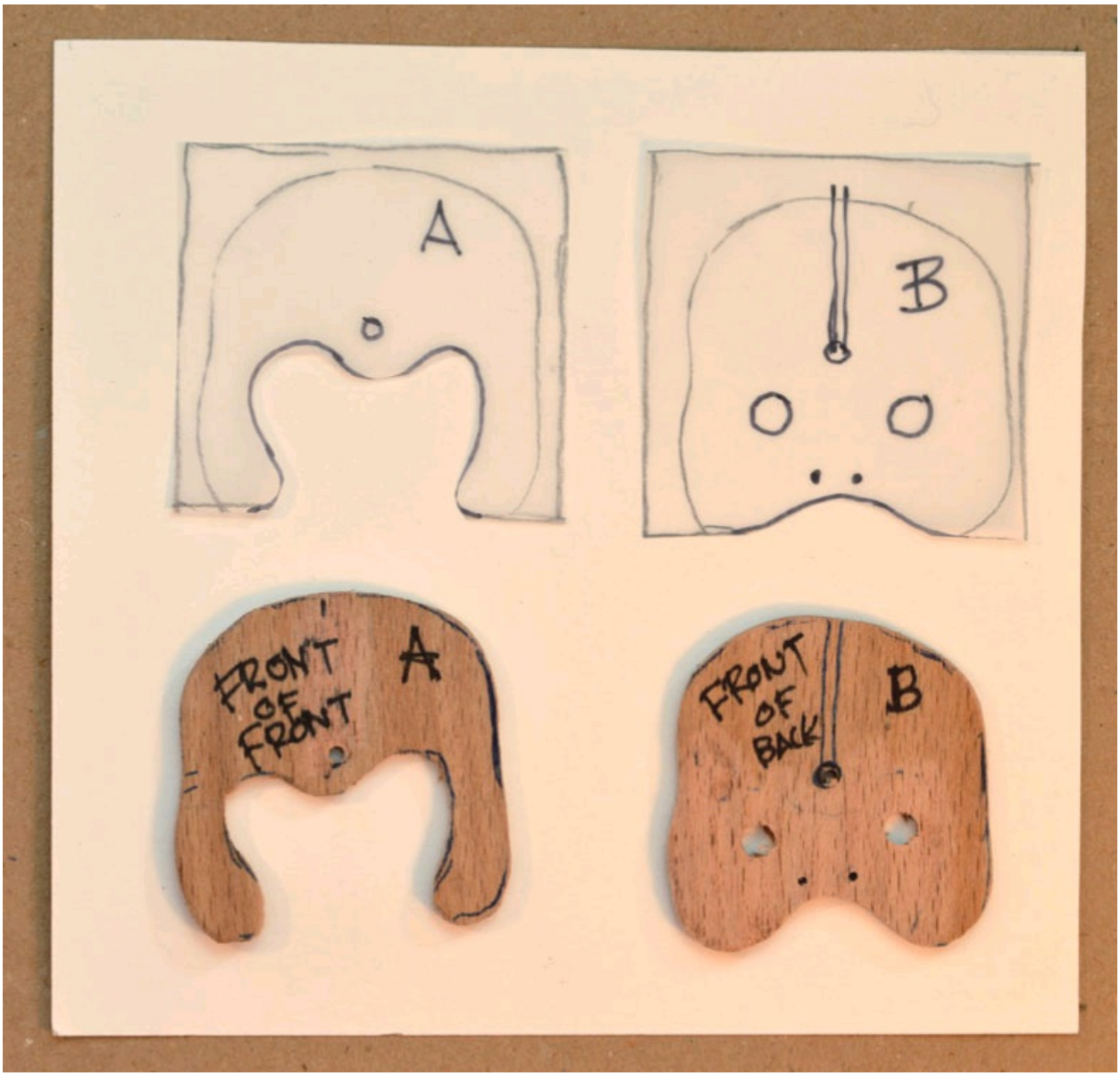
4. To make an arm-bar, cut 9mm dowel 21cm long. Sandpaper the ends. Cut 8cm of 3mm cord and burn the ends. Form a loop in the cord and tape it onto the centre of the bar. Check that you can hook this loop onto the small wire hook and unhook it easily. Remove the tape and cord. Spread PVA glue on the dowel where the cord was, all around the dowel. Attach the cord by wrapping linen thread around cord and dowel, adding more glue as you go. Tie the thread off and rub more glue over the thread. When dry, cut away excess thread. Bradawl the ends of the dowel and screw in two screw-eyes, aligning them to be vertical when the bar is hanging from its loop.

Hollow the head: Step by step

Hollow the head – step 1.

1. When the papier mâché on the head is dry, sandpaper it, and then mark a pencil line around the head, going through the centre of the neck. Cut into this line with a craft knife with a long, broad blade, starting with a shallow cut and gradually getting deeper, until you have cut the head in half.


A



Step 2.

2. Place the face onto thin plywood, with the grain running up/down. Trace around the head with a pencil. Do this twice so you have two tracings of the face. Ink a line 0.5mm inside your pencil tracing. Label these ‘A. Front of front’ and ‘B. Front of back’. This sounds confusing, but it will make sense later! Trace the head patterns A and B from the template. Mark these inside your plywood tracings of the face, aligning the bottom of the template tracing with the bottom of the head tracing. Drill through the ply where shown with 5mm, 2mm and 1.5mm drill bits. Coping saw the ply shapes out and give them a sanding. Label the

backs of the ply as follows: ‘A. Back of front’. ‘B. Back of back’.

Step 3.

3. Scoop out the clay from the head with a spoon. If the clay has hardened, soften it with a few drops of water. Keep cleaning the clay out till most of it is gone. Some sections like the tips of the nose and chin will be difficult to clear fully. This is not a problem – just leave the clay there. Give the inside of the head a wipe with a damp cloth to remove any residual clay. Let the head dry out. When dry, sand the inside roughly and spread undiluted PVA inside. Add a rough layer or two of papier mâché to give the head extra strength. Allow to dry.

Step 4.

4. Tape the halves of the head together temporally. Trace the NECK HOLE shape from the template and transfer this to your puppet head, drawing around the existing neck hole. Align the template drawing so the dotted line is central to your existing neck hole; this will give you a bigger hole at the front. Rest the head halves on a small scrap of wood as shown and cut away the oval with a craft knife. Sandpaper the edges of the neck hole.

Make neck

Soften some polymer clay and make a neck 30mm long with a diameter of 15mm to 17mm. Build this on a short length of 9mm dowel. Mark the length needed on the dowel. Trace the NECK THICKNESS from the template onto a bit of thin card, and cut it out to measure the diameter of the neck as you make it.

Slip the neck off the dowel to check two 4mm cords can fit through the hole.

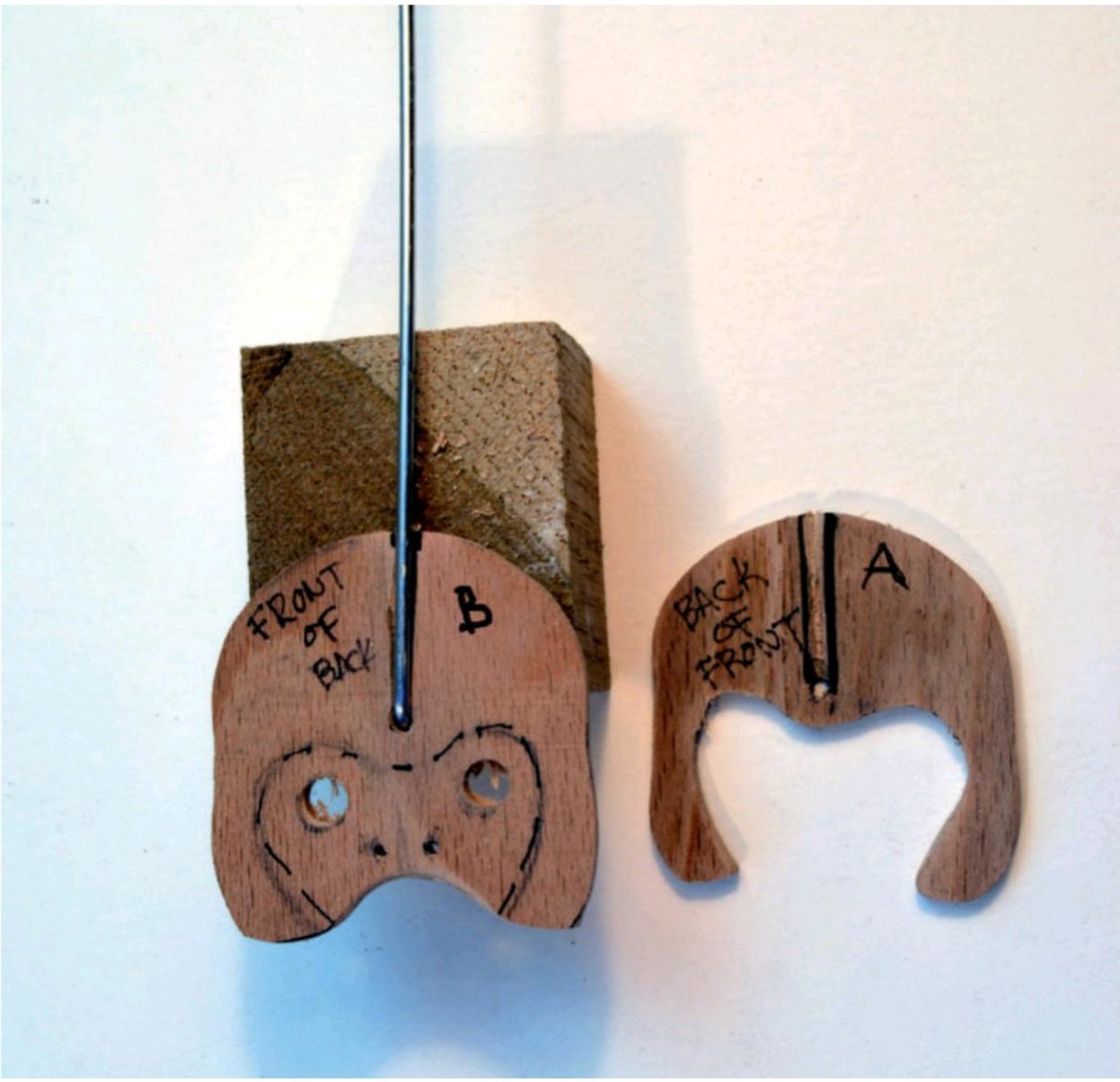
Bake in an oven as before, leaving it on the dowel till cool.

Polymer clay modelled on dowel for the neck.

Assemble the head: Step by step

Assemble the head – step 1.

1. Using a craft knife and a metal ruler, cut shallow V-shaped grooves into your plywood head pieces. Only groove sides labelled ‘A. Back of front’, and ‘B. Front of back’. Make the grooves just deep enough so the control wire can fit into the gap formed when the two ply shapes are brought together to make a sandwich. Bend the end of your control wire into a sharp, right-angled bend about 1cm from the end, with the bent end pointing in the same direction as the control’s large hook.



Step 2.

2. Place the control wire through head ply B, resting it all on a block of wood. Check that ply A can be fitted flush onto B. Hammer the wire into the groove or deepen the grooves till the two bits of ply fit together perfectly. Sandpaper the edges of the ply till A fits into the front of the head snugly and B fits into the back of the head. Glue A and B together with undiluted PVA, with the control wire between the ply. The large control hook must be pointing to the back of the puppet. Clamp with a G-clamp, and leave till dry.

Step 3.

3. Slip the neck over the spinal cords. The neck wants to be loose on the cords. Make marks on cords and ply, leaving a gap about 5mm, between the top of the neck and the head ply. Use a florist wire staple to secure both cords as you did for the body. Thread the cords through the holes in the head ply and tie knots. Cut the cord excess off and burn the ends.

Step 4.

4. Fit the back of the head onto the ply, sanding away the edge of the ply as needed. Do the same for the front of the head. Make small notches in the papier mâché with a craft knife for the control wire. Glue the back of the head onto the ply with PVA, leaving the front ply protruding. Leave to dry.

Step 5.

5. Glue the front of the head on. Leave to dry. When dry, fill any gaps between the front and back of head with a little filler. Leave to dry and sand off excess filler. Add a papier mâché strip across the join and leave to dry.

Paint the puppet: Step by step

Paint the puppet – step 1.

1. Smooth the head, neck and hands with medium and fine sandpaper. Fill any faults with filler, spread on with a spatula. Use a dowel to redefine the holes for the eye beads. Allow to dry and sand the filler smooth. Repeat if necessary.

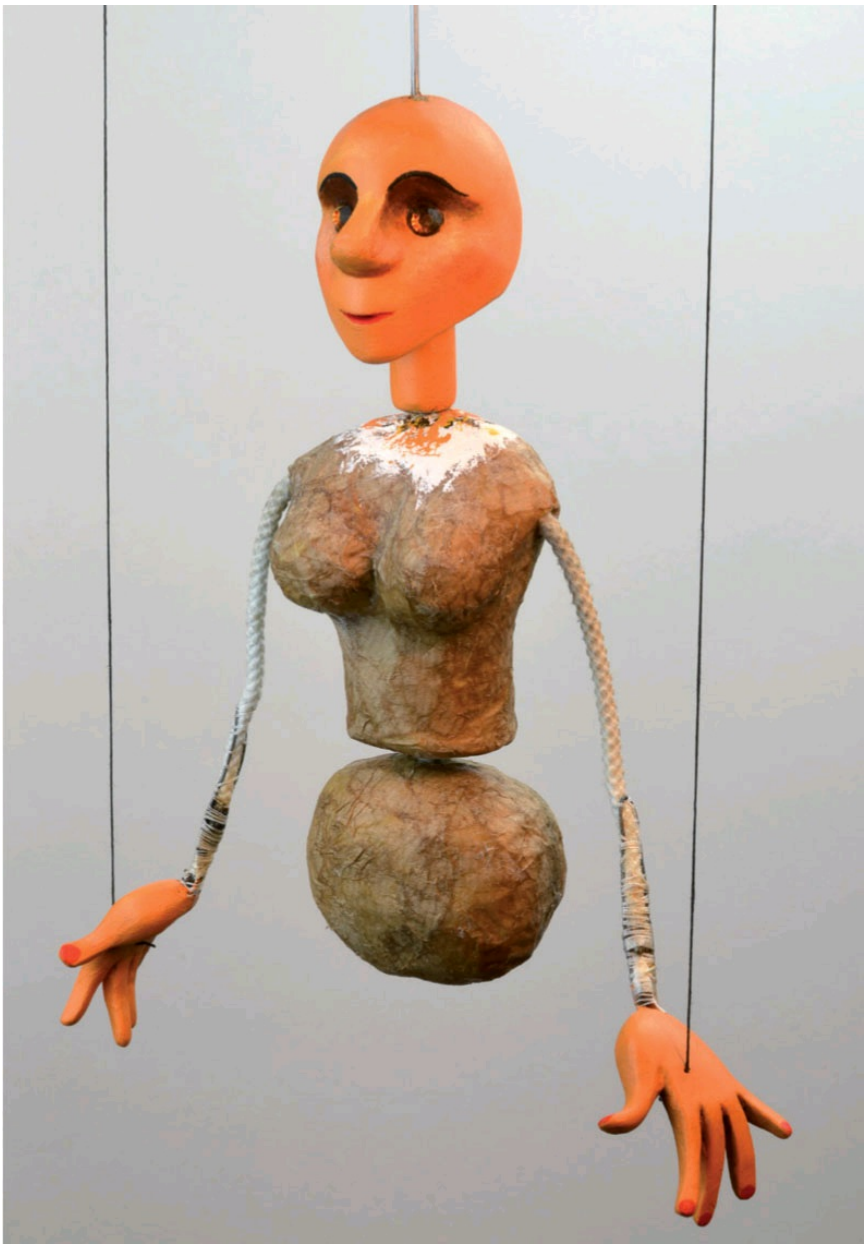
Step 2.

2. When you have a smooth surface, paint with household white matt emulsion paint. Allow to dry. Rub down with fine sandpaper and paint again with white emulsion.

Step 3.

3. Mix up artist's acrylic paints to make a base colour for the skin. You can choose to paint your puppet any colour you like: pink, brown, black, orange, green, blue, or purple! Work out what colour you want and mix a fair amount in a jar. I used white, red and yellow to make the base colour. A touch of blue will darken the colour towards a brown. I painted the hollows with a burnt umber and then painted on my base colour. I added more brown to accentuate the eye hollows, a little white to bring out the cheekbones, and red on cheeks and mouth. Dark brown eyebrows finished the painting. I painted the hands first with brown between the fingers, followed by the base colour and I finished with finger nails in red. Clean paint out of drill holes with a bit of wire. Acrylic paint dries fast and is water-based which makes it easy to work with. It can be used thick or you can thin it with water to add transparent layers of paint. It produces a matt finish which is ideal for puppets. The paint when dry can be cleaned with a damp cloth. Sandpaper any paint off the control wire coming out of the head. Glue in the eye beads with UHU glue.

Fix hands onto arms



The arms are sewn onto the arm cords, and control threads are attached.

Stitch the hand wires onto the arm cords with needle and sewing thread, going through the hole in the hand's wrist a few times, and stitching all the way up to the elbow. Use a thimble to push the needle through the cord.

Make sure you have the correct hand on the correct side!

Tie the end of 60cm linen thread into a double knot and thread it up through the hand. Repeat with the other hand. With your puppet hanging up, run the hand threads up to the arm-bar. Tie them through the screw-eyes with a full knot, so the bar hangs horizontally and the hands are slightly raised.

The wire in the arms allows you to change the bend and angle of the wrist, but do not bend the wire too often, as eventually it will break.

Make a wig

Cut corrugated cardboard 10cm x 18cm. This is for a hair length of 18cm as measured from the top of the head. If you want your puppet to have longer hair, increase the length of the cardboard.

Wind five to ten wraps of coloured embroidery thread around the cardboard. Tape it to the card and cut through all the threads. Remove cut threads from the cardboard. Repeat with other colours of thread and thin ribbons until you have piles of all the colours you want to use. I will call this the wig thread.

Cut 60cm of a strong coloured thread. Tie a loop at the centre, so it can be hooked onto something solid like a door handle, or a G-clamp fixed to a table.

Tie one of the free ends to a belt around your waist. Stand so the thread between you and the loop is pulled tight. I will call this the tight thread.

The other end of the cord will hang free. I will call this the knotting thread.

Take a few strands of your wig threads and balance them onto the tight thread, with equal lengths hanging to the left and right. Take the knotting thread and tie a single hitch around the tight thread, capturing the wig thread. Repeat with other colours, tying the knotting thread in the same way each time, for example, always passing the knotting thread over the tight thread from left to right, or vice versa. This makes a simple wig with a parting.

Keep going until you have about 45mm of length to the ‘parting’. Finish with two half-hitch knots. Cut off the holding loop, the end tied to you and the knotting thread.

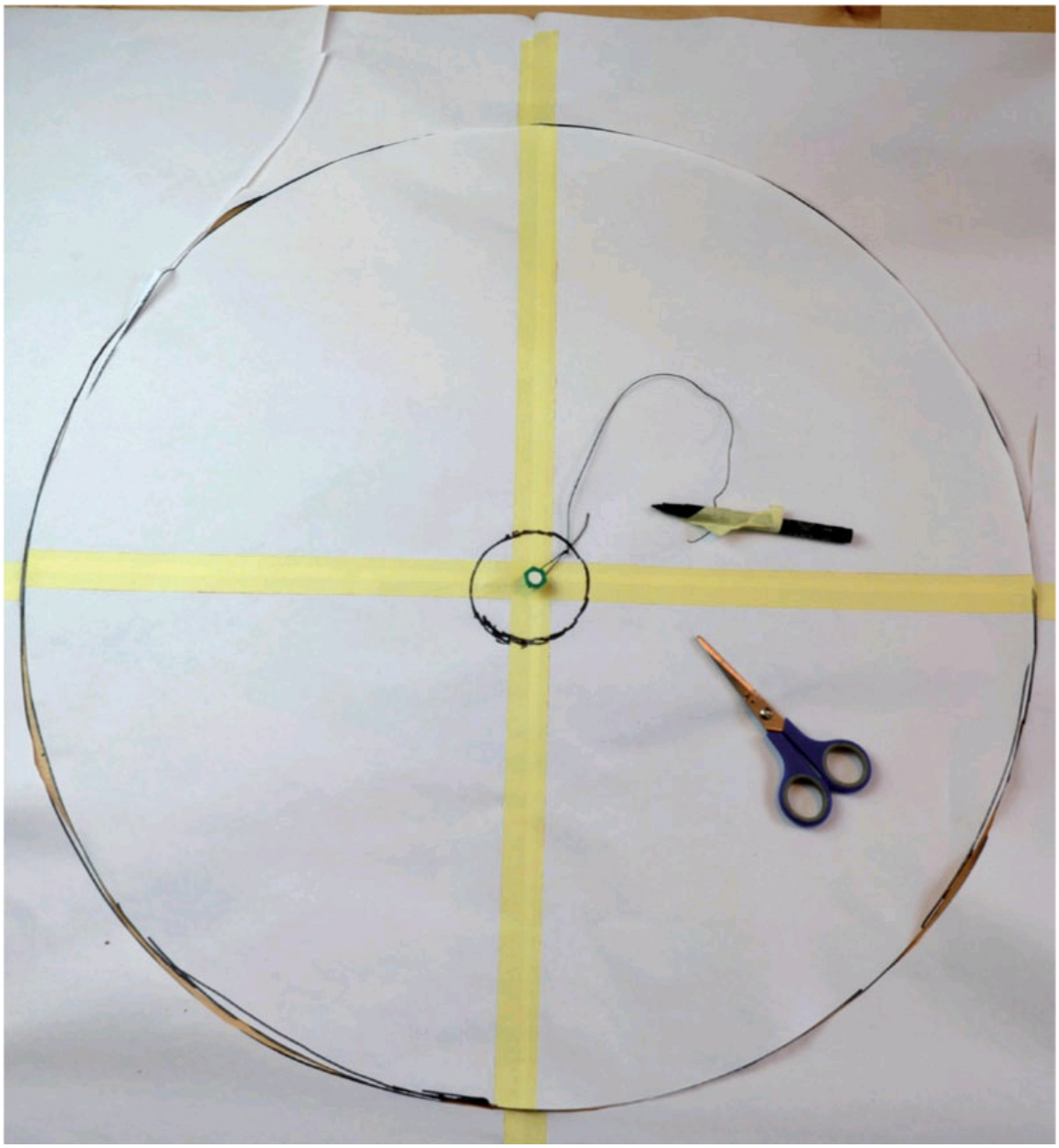
All the wig materials laid out, with the wig partly made.

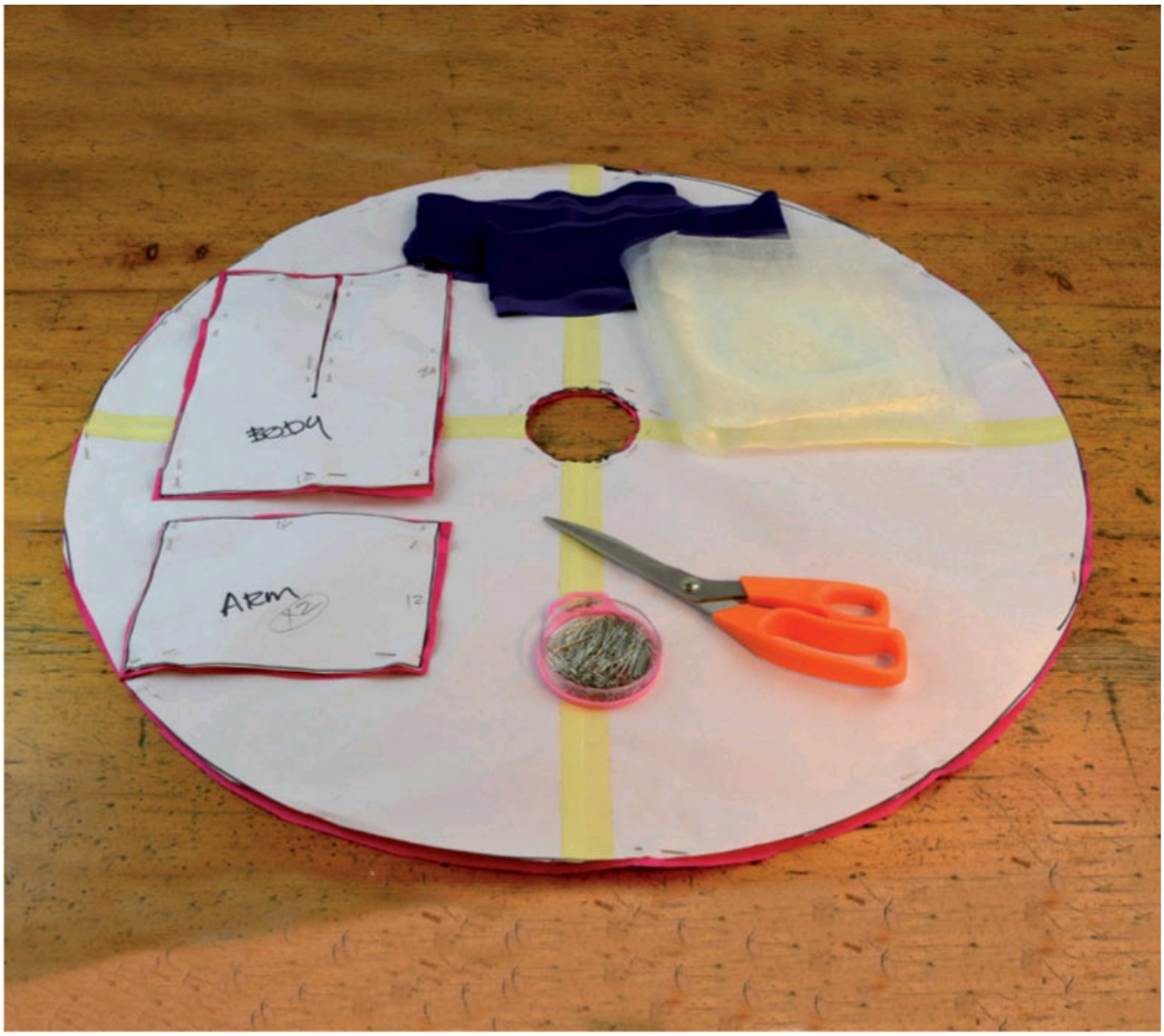
A sample showing how the wig is knotted.

Arrange the wig on the puppet. Mark softly with a pencil where the parting will be and remove the hair. Squeeze a line of UHU along the parting line, and place the wig onto the glue, pulling down on the hair for about a minute until the glue is set. Mark a pencil line about 20mm below the parting on each side and at the back. With the puppet upside down, add a line of glue onto the pencil line. Smudge the glue slightly with a finger. Turn the puppet the right way up and arrange the hair from the parting onto this glue line.

Costume: Step by step

1. Wash all fabrics, by hand or machine, in warm water with a little fabric washing powder or liquid. This is to remove the fabric dressing and soften the fabric so it hangs well. Rinse, dry and iron the fabric.



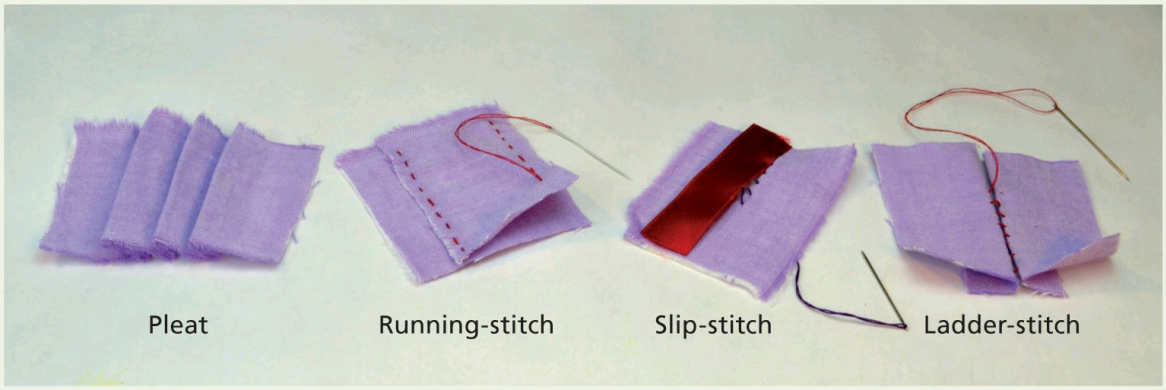


Costume – step 2.

2. Draw shapes onto any paper and cut out:

    - Skirt: 32cm radius. Inner circle 3.5cm radius. To draw the circles, push a mappin into the centre of the paper and tie a pen to it.
    - Bodice: 16cm x 24cm with a 15cm slit cut in the narrow side.
    - Sleeve: two needed, each 12cm x 16cm.

Pin patterns onto fabrics and cut out. Cut overskirt 85cm x 36cm. Cut 8cm wide bands for the bottom of the skirt.



Stitches and fold used.

Stitches and fold used.

Step 3.

3. Make up skirt. Use a sewing machine if you have one, but if not, hand sew. Use running-stitch for the following:

- Sew band strips together along the short edge, fold in half lengthwise, with seam to the inside, and press.
- Pin then sew the band to the bottom of skirt, overlapping the raw edges, and trimming off any excess band material. Pin narrow trim as shown. Pin wide trim to cover the join between skirt and band. Slip-stitch the trims on.

Step 4.

4. Pleat skirt top onto puppet's waist, making 0.5cm folds along the top of skirt and sew in place. Glue skirt top to puppet's waist with UHU. To

prevent glue getting on the fabric, turn the puppet upside-down, and tie the wig-hair out of the way.

Step 5.

5. Sleeves: sew small bindings of offcuts from skirt band around wrists, and glue onto the rope with UHU. Fit sleeves to arms, turn under long edges and ladder-stitch together. Gather bottom of sleeve to fit wrist, cover with trim and sew in place, with ends of trim folded in.

Step 6.

6. Bodice: put bodice on, turning side edges in and ladder-stitch closed. Cut collar from skirt band offcuts, 20mm x 40cm. Fold long sides together and press. Sew on some trim (we have used wide trim folded in half) then slip-stitch to bodice. Sew down to waist. Catch top of sleeve to top of bodice with a stitch, making sure arm can still move freely. Gather bodice to waist and cover join with wide trim.

Step 7.

7. Overskirt: bind edges of overskirt fabric with wide trim. Embellish with sew-on sequins, iron-on or glue-on diamanté. Drape around puppet to find the best position and fix it on with a few stitches.

Performing

This puppet is very easy to perform.

Slow, gentle, flowing actions show off the movement of the fabric of the dress and of the hair. Side to side twists will make the dress and hair spread out. The arm-bar can be lifted off to get good arm movements. Try allowing a lot of the puppet's weight to be taken on the hand strings so as to bend the body from the waist.

The rod to the head gives very subtle head movements. Looking up and down is not as easy as side to side.

The hips can be moved by using the control in a flicking action.

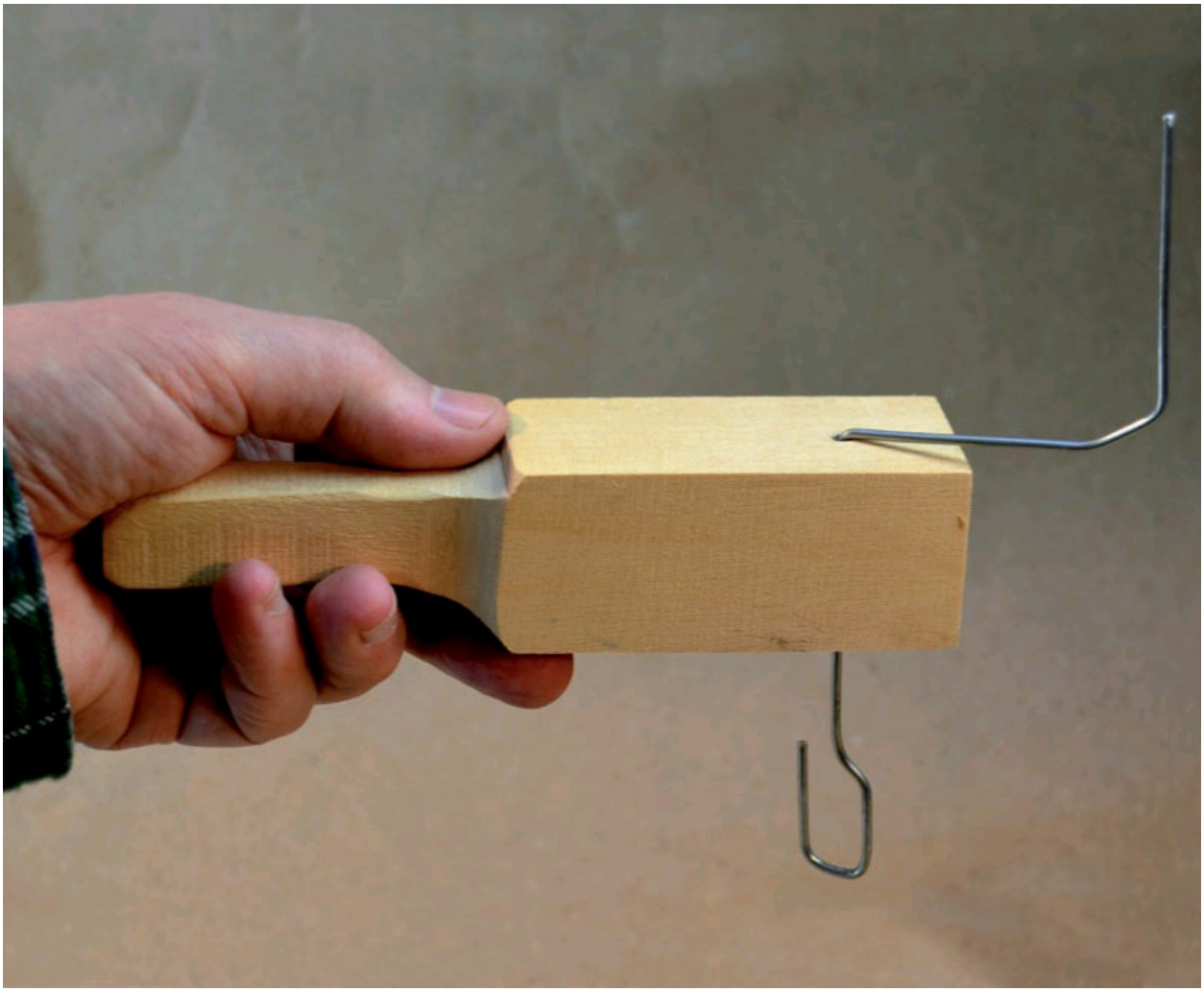
The Dancer puppet ready to perform.

You can spin the puppet: hook the arm-bar on its hook, hold the puppet by the rope handle with thumb and fingertips of one hand, twist one way as far as you can and then back again. For a larger spin: twist as far as you can, then pass the control to your other hand and keep twisting in the same direction. You could make a little handle and crank, to hook your puppet onto to do a turbo-charged spin!

A child as young as five can have great fun performing this puppet, but do supervise anyone under eight.

Very young children will love watching. Don't let them touch the puppet or get too close, especially when it is spinning.

Put on some music and get dancing!



A crank for extra fast spinning.

The Dancer striking poses.

Doing a spin.

CHAPTER SIX

PROJECT 3: A WOODEN MAN

The Wooden Man is string puppet made from wood.

This project showcases a traditional wood carved puppet that is fully articulated with all limbs controlled by strings. Being un-clad, the figure shows off the jointing and structure of the puppet.

This is the trickiest of the puppets to learn to bring to life.

The puppet stands 48cm tall.

The Wooden Man puppet

Techniques used

This is the most complex of the projects, needing some specialist carving tools, the right type of wood, as well as time and care in the making process. At least a full week should be allowed to complete the puppet.

It is still a relatively simple puppet to create, being made almost entirely

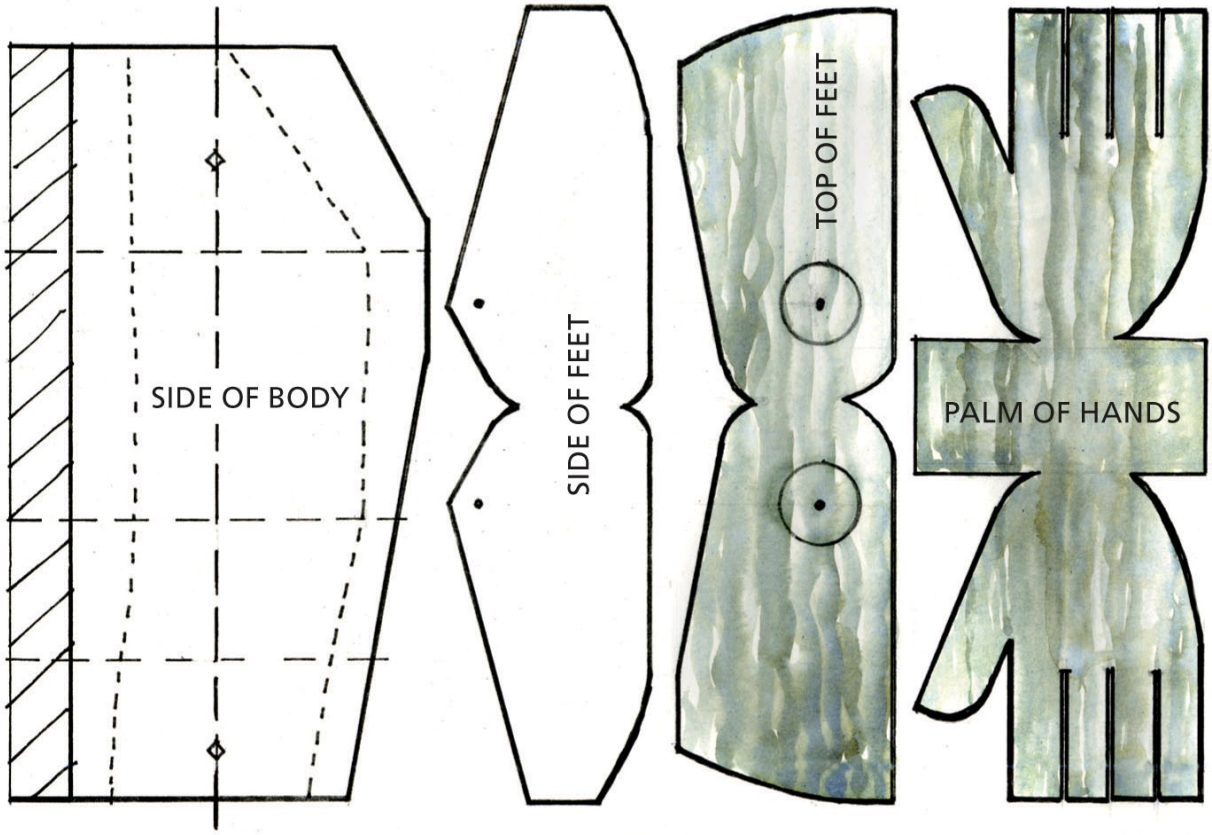
from one material – wood, rather than using a lot of different substances. The joints are easy to make, there is no costume and the method of control is still basic. To further simplify things, I have worked out patterns for you to follow.

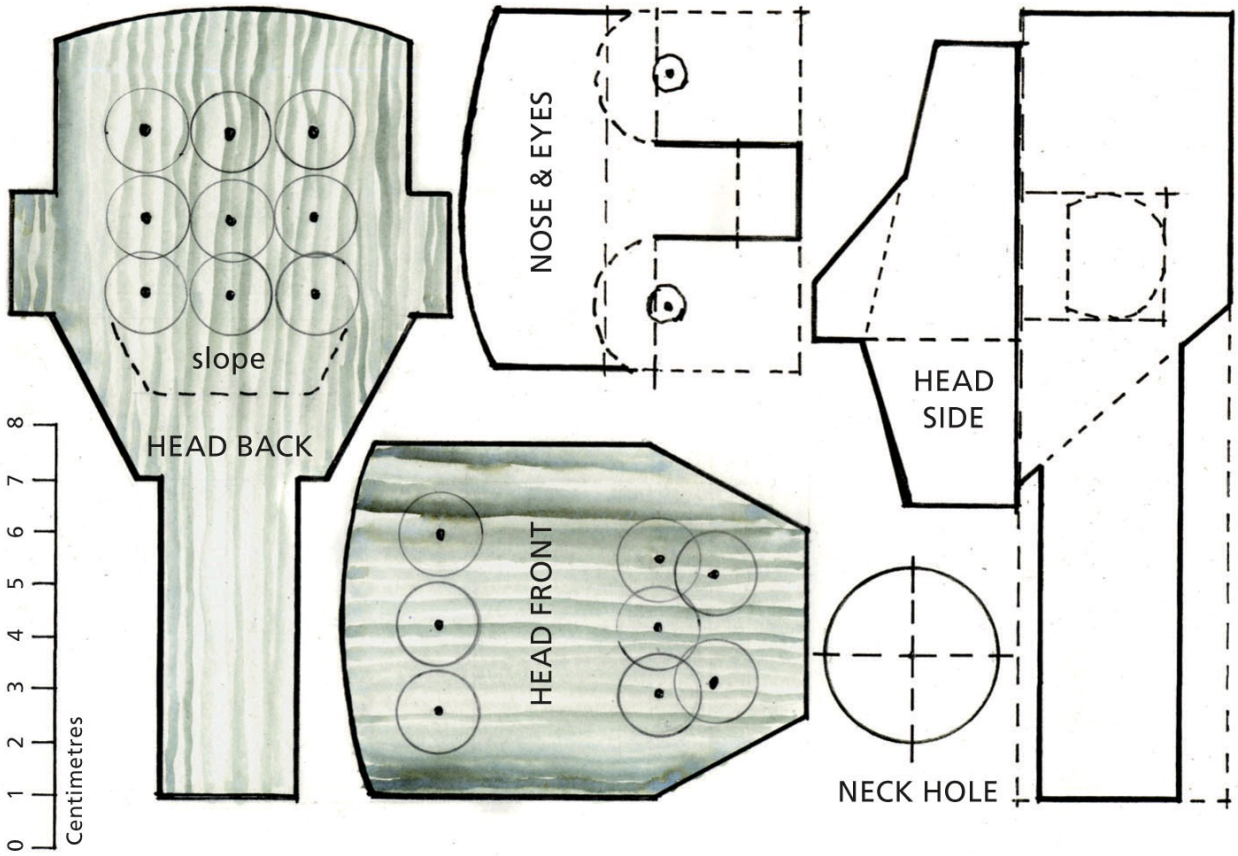
Most of the making is carving and carpentry using saws, drills and chisels.

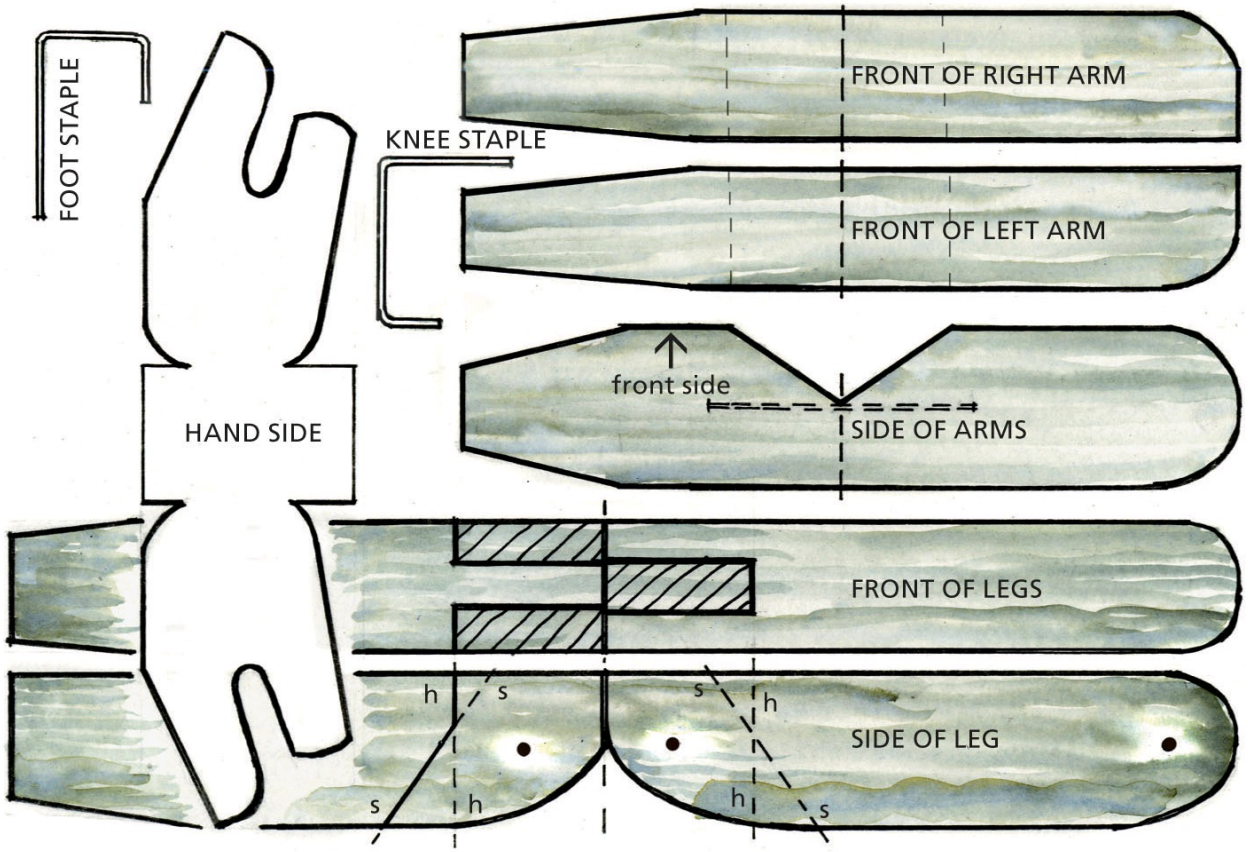
Some extremely sharp tools will be used, so the project is only for an adult or a carefully supervised older child from about eleven years old.

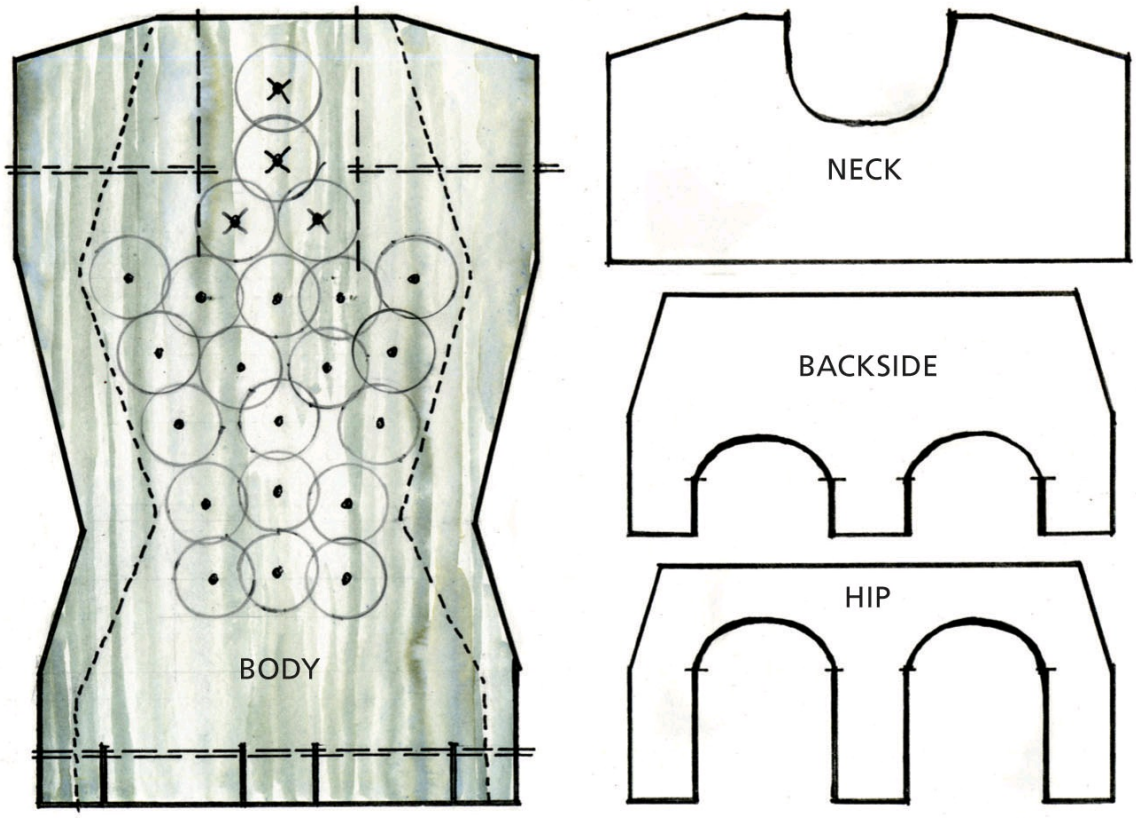
The making is what I call *clean mess*, with only a little glue and wax involved.

I sketched out the design on a drawing board and then made templates for all the parts.


SIDE OF BODY
SIDE OF FEET
TOP OF FEET
PALM OF HANDS


HEAD BACK
slope
HEAD FRONT
NOSE & EYES
NECK HOLE
HEAD SIDE
0 1 2 3 4 5 6 7 8
Centimetres


FOOT STAPLE
KNEE STAPLE
FRONT OF RIGHT ARM
FRONT OF LEFT ARM
front side
SIDE OF ARMS
HAND SIDE
FRONT OF LEGS
SIDE OF LEG
h
s
s
h
s
h
h
s



Tools

Tools needed in addition to stock tools.

Buy from specialist tool suppliers, builder's merchant, hardware shops and automotive suppliers:

- Carving chisels:

  22mm-wide flat chisel, with a single bevel. I have used a chisel made by Flexcut with a 75mm-long plastic handle; this is a light-weight, easy to use tool. The blade can be removed from the handle, so you can buy other chisel shapes/sizes. This chisel must not be hit with a mallet/hammer. It comes sharp, ready to use.
  10mm-wide shallow gouge, shape number 7.
  I have used a gouge made by Swiss company Pfeil. This gouge is sold sharp, ready to use and can be bought with a long or mediumlength handle and can be hit with a mallet. Any good quality chisels close to

these sizes will work, as long as they are super sharp, and you can mallet the gouge.

- Medium size handsaw. I have used a toolbox saw, the blade of which is 1mm thick, 36cm long, tooth pitch 2.31mm (11tpi). Any handsaw that can cut through 25cm of wood easily is fine.
- Try-square, sometimes called a carpenter square.
- Oil for use on chisels: a light oil like 3-in-One. A small can.
- Autosol metal polish.
- Large drill bits: Forstner 15mm and 12mm. These are fantastic drills with a centre point.
- A flat board about 1cm x 14cm x 28cm: MDF or plywood. Glue coarse sandpaper to one side with a thin spread of PVA glue.
- A vice is essential for this project. A small vice is fine, with lined jaws, able to clamp at least 10cm. This must be securely clamped or bolted to your bench/table, which must be pushed against a wall, or somehow secured so it does not move when you push your weight against it. A small vice is shown in the chapter Getting Ready to Make.
- A bench hook: not essential, but it is very useful. Screw it firmly to your bench/table with heavily countersunk screws.
- A wooden mallet: not essential, but good to have if you plan to do more wood carving.

Additional tools needed.

Materials

Materials needed in addition to stock items.
Materials that should be left over from Project 2:

- Florist wire: 20swg (0.9mm) at least 2 lengths each, 30cm long.
- PVA wood glue.
- Cord: braided, very flexible. 4mm x 50cm.

Buy from timber merchants and hardware shops:

- Jelutong carving wood: a plank 40mm x 150mm x 70cm. Can be cut into shorter sections: 3 x 150mm, 1 x 250mm with grain running the

length. Can be bought planed or rough-sawn. This is a very soft, even-grained wood. Hunt for importers of hardwood or look on the internet. Although it is classified as a hardwood, it is very soft to carve. USA bass-wood is a good alternative.

- Dowel rods in hardwood: 12mm diameter x 76mm. 5mm x 50mm.
- Wire: 1.6mm x 50cm. Standard wire that can be bent.
- Large screw-eye: one 30mm-long screw-eye with 8mm hole.
- Plastic wood or wood filler: a tube of pine or natural colour.
- Hair for the puppet. I have used bristles from a brush.

Additional materials needed.

Warning

You will be working with sharp chisels. Keep these away from children.

Put a cloth on your bench to place your chisels on, so they do not hit against any other tools, or against each other. Place the chisels on this cloth whenever you are not using them to carve.

The trick to preventing cutting your hand while carving is this: keep all of your fingers and hands *behind* the cutting edge. This seems simple, and it is … as long as you remember!

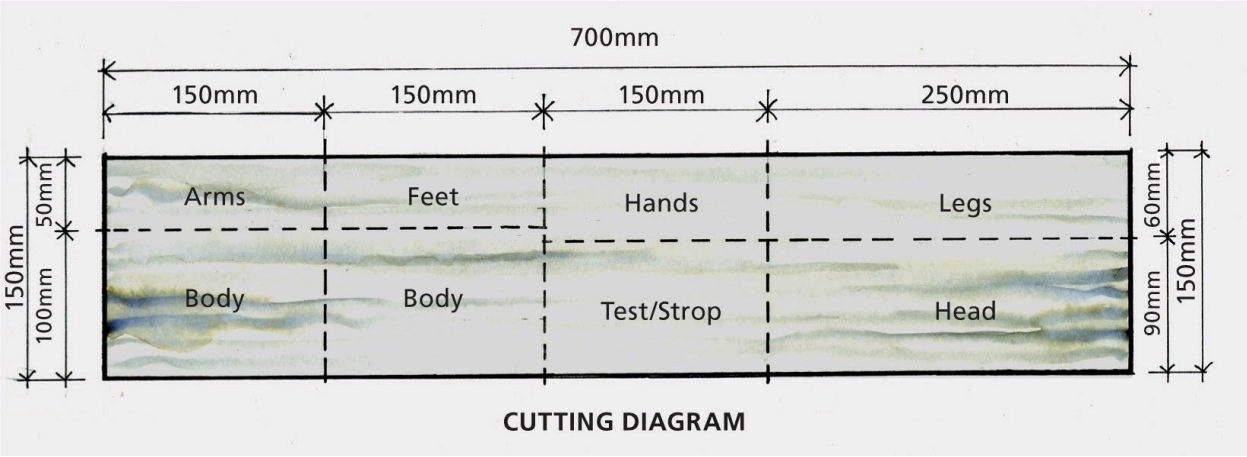
Have some fabric-backed adhesive bandages/plasters, and antiseptic wipes nearby, just in case.

Saw blocks

Mark out blocks on your jelutong plank as shown on CUTTING DIAGRAM.

Project the cut of the plank lines down sides and ends with a try-square. With the wood clamped firmly in your vice, saw vertically down to cut the wood into blocks. Label each block and draw an arrow indicating the grain direction, which should be running along the length of the plank. Mark an X on the end-grain of every block.

Saw the TEST/STROP block to make two thin pieces, each about 20mm x 90mm x 150mm. Label one 'test', the other 'strop'.



CUTTING DIAGRAM

If the wood is rough or dirty, sand the blocks on your sanding board.

Sanding across the grain will work fast, but finish by going up and down in the grain direction. With a clean hand brush, remove the dust and use an old dry toothbrush to get rid of any grit that has come off the sandpaper. The grit will damage the sharp edge of your chisels. If you have a plane, use this to clean the wood, instead of sanding, but do not plane the end-grain.

Sharpening

Sharpening chisels is a vast subject, so here are just a few key things you need to know.

Always keep your chisels sharp, as they will carve easily and be less prone to slipping about on the wood.

A new chisel from some makers arrive blunt, and it takes a lot of kit, time and skill to sharpen properly. So buy ones that are ready to use.

Never take carving chisels to a tool-sharpening service at a hardware shop; they might use a high-speed grindstone and this will destroy the delicate cutting edge.

All you need to keep your chisels sharp for this project is to use a process called stropping. You want to strop every half hour or so of carving time. All you will need is a scrap of wood and a tube of Autosol metal polish.

Make sure the block labelled ‘strop’ has been well sanded, to give a flat clean surface. Apply a generous blob of Autosol to the wood. Place the flat chisel with its bevel onto the wood, at exactly the bevel angle, and pull the chisel towards yourself, keeping the bevel on the wood, at the same angle all through the stroke. Be careful not to cut your fingers. Stop before you come to the end of the block. Apply pressure and do about ten strokes. The polish will start turning black, which means it is working.

Repeat with the flat side, keeping the chisel only raised a millimetre off its back, by angling the handle off the side of the strop.

For the gouge, chisel into the edge of the strop block, to make two shapes, one for the outside, one for the inside of the cutting edge.

Stropping the bevel of the flat chisel.

Stropping the flat back of the chisel.

Hollows cut into wood with the gouge, to strop the inside and outside of the cutting edge.

Apply Autosol and slide the chisel up and down in these grooves, and use a twisting action to burnish the bevel and the inside.

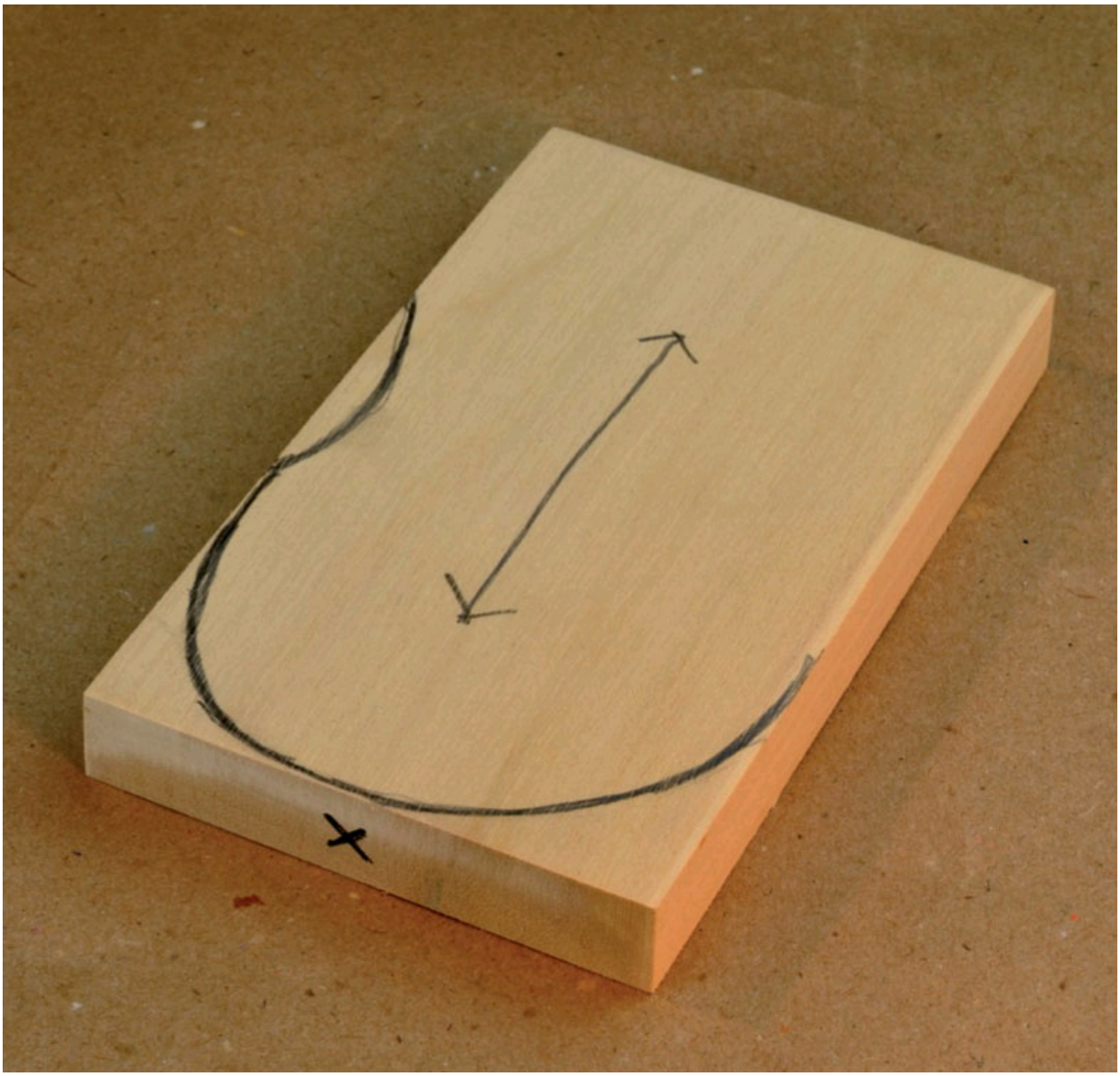
Stropping should produce razor-sharp cutting edges. Wipe the blades on a clean cloth or paper tissue, placed on your bench.

When you are finished using your chisels for the day, wipe the blades with a little 3-in-One oil to protect them. Before carving, wipe the oil off. To store the chisels, wrap them in some cloth, without the cutting edges touching.

If a chisel's cutting edge gets damaged, the wood will start ripping rather than being sliced smoothly. It is then time to re-sharpen rather than just stropping. After a lot of use, the cutting edge becomes slightly rounded, and therefore less sharp: it then becomes necessary to re-sharpen on a 'stone'. If you have used your chisels carefully you should get through making this puppet without needing to do this.

Sharpening on stones is beyond the scope of this book. Talk to a wood-carver, look online or get a book. I recommend using diamond stones.

Carving practice: Step by step



Carving practice – step 1.

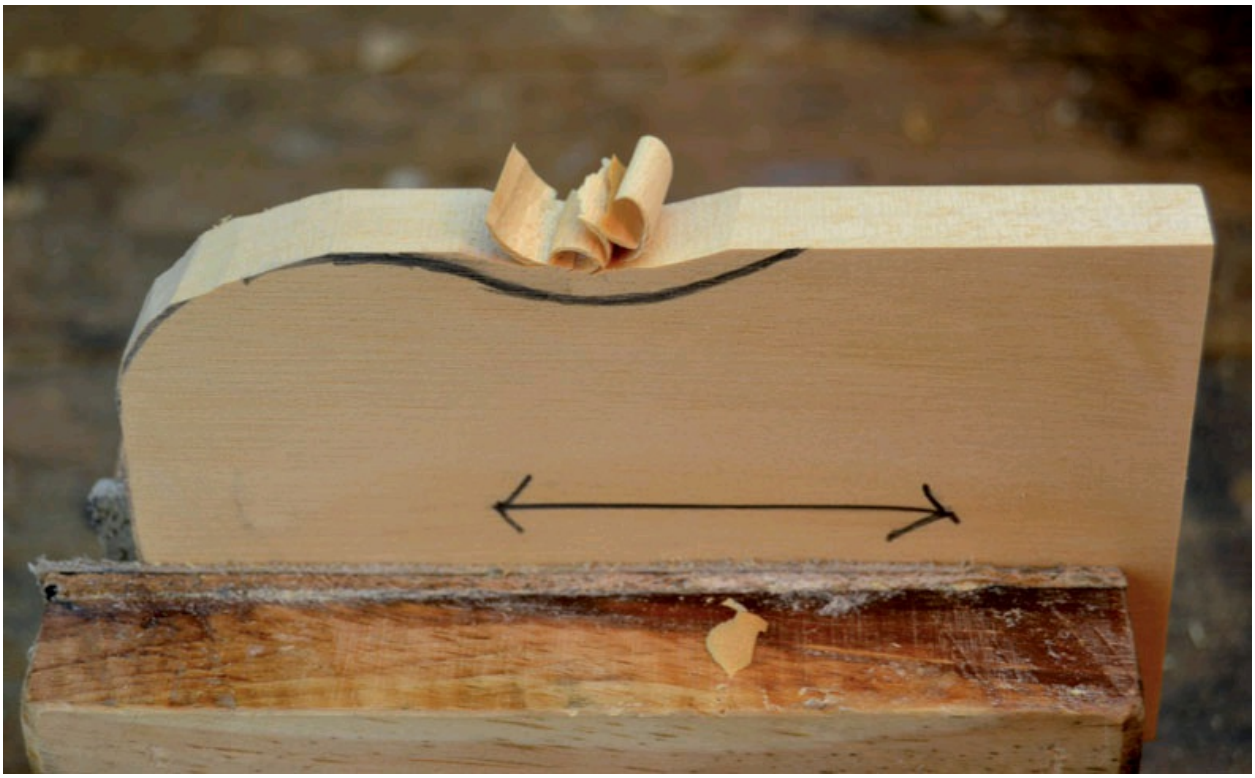
1. Look at the block of jelutong labelled ‘test’. The grain pattern of jelutong is very subtle, but if you look carefully you should be able to see the grain, showing as small dotted lines, and on the ends curved lines. Splashing water onto the wood will reveal the grain. Mark X on the end-grain, and draw an arrow confirming the grain direction. Draw a

shape as shown.

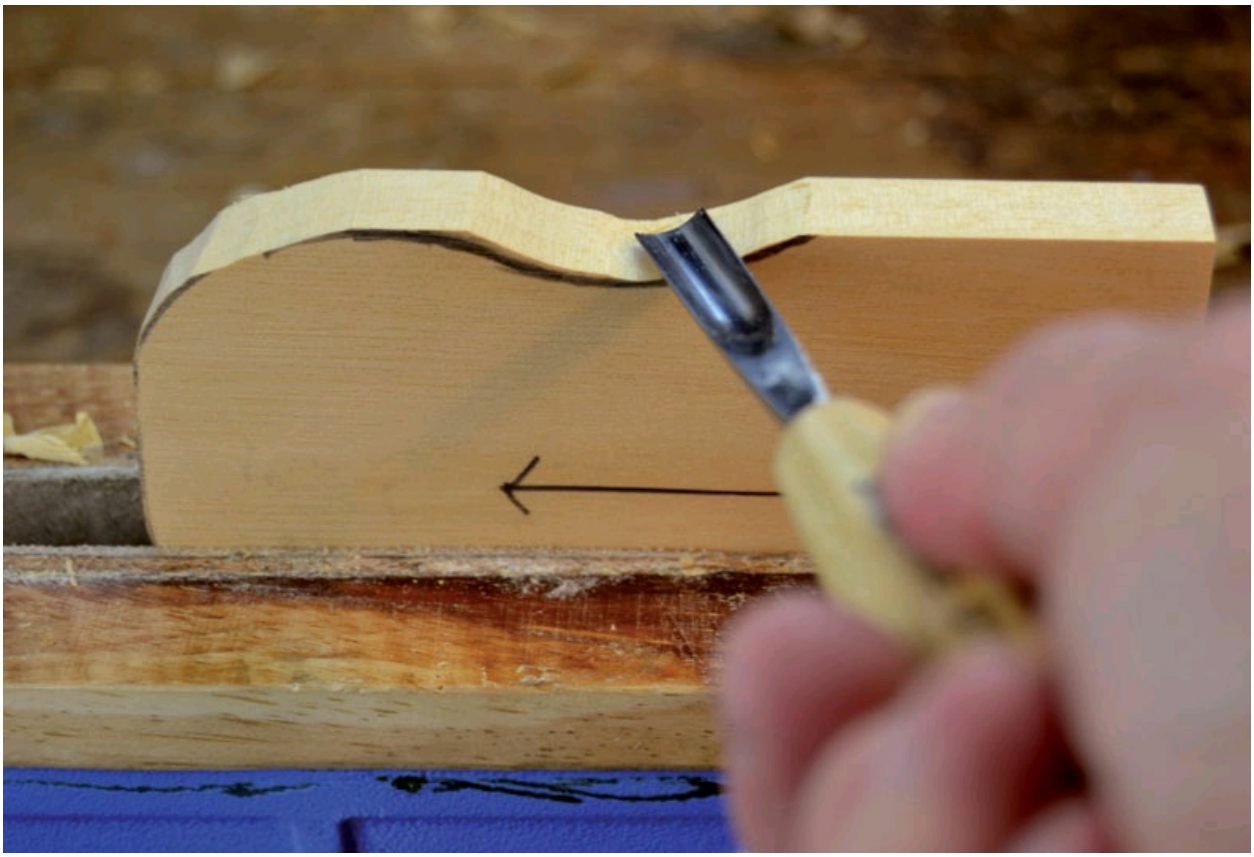
Step 2.

2. Make sure your chisels are sharp. If you have bought the ones I suggested they will be ready to use. Clamp the wood in your vice. Hold your flat chisel as shown with your stronger hand, pushing the handle of the chisel. Your other hand should cup over your push-hand to stabilize things, and to keep both hands away from the cutting edge. In the photograph I have left out my left hand, so you can see the chisel-holding position. Start carving from the side edge of the wood towards the end-grain. Do not take too much off in one go. If you carve in deeply, the chisel will suddenly lurch forward as you break out of the wood, and you can cut your knuckles on the wood. It is easier to chisel at a slight angle across the wood. Work your way down to the curved line, using the flat side of the chisel. As you get towards the end-grain, you will notice the wood gets harder to carve. Turn the wood around in the vice and carve a curve on the other edge. Always work from the side of a block towards the end-grain. If you carve from the end

towards a side, the wood will split. Try it! You should find the wood carves easily, leaving a smooth, polished surface.



Step 3a.



Step 3b.

3. To carve a hollow, have the bevel of the chisel against the wood. Cut down into the hollow, working from alternate directions, by moving to the left and right ends of the wood, always cutting away from yourself. Start with little cuts near the centre of the hollow, and work outward. Finish off the bottom of the hollow using your gouge, carving directly across the grain.

Step 4.

4. Make a spoon hollow. Start by making shallow cuts with your gouge, around the edge of the shape, working inward.

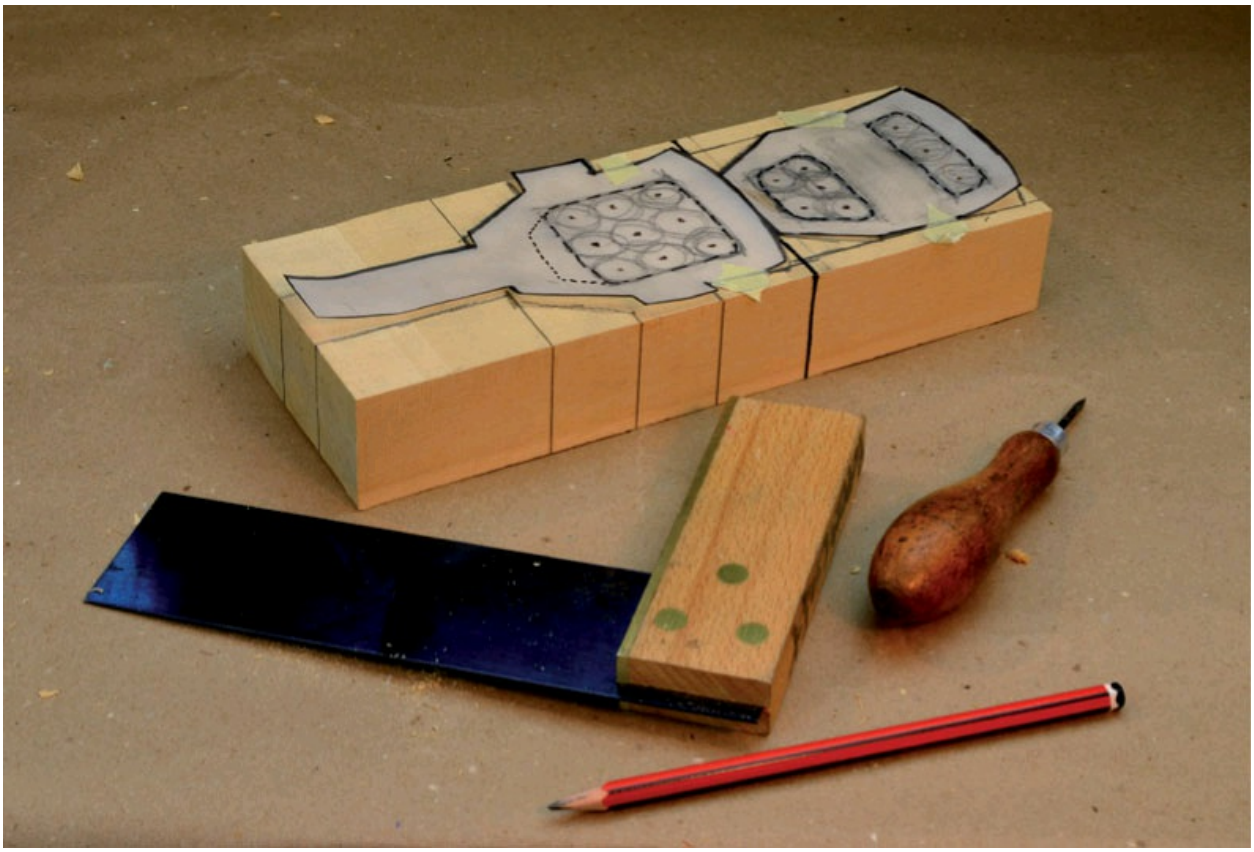
Making

Photocopy the templates, enlarging to 200% to give you full-size patterns.

You can do this as four A4 pages or two A3 pages. Check the copies to make sure the 8-centimetre scale on the template comes out as 8cm.

The templates may be copied in a photocopy shop.

Carve the head: Step by step



Carve the head – step 1.

1. Transfer outline of HEAD FRONT and HEAD BACK onto the HEAD block, along with centre-points of drill holes, grain direction and area labelled ‘slope’. Project perpendicular lines down the edges and ends of the wood block as shown.

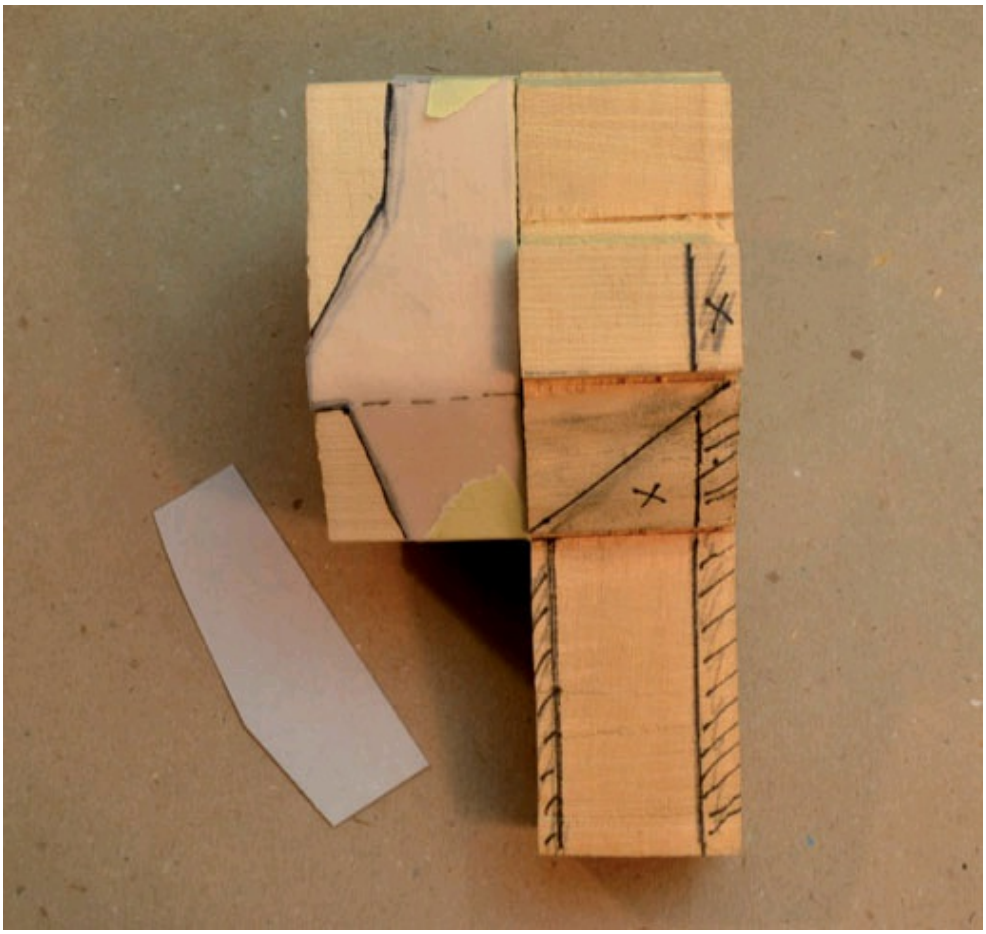
Step 2.

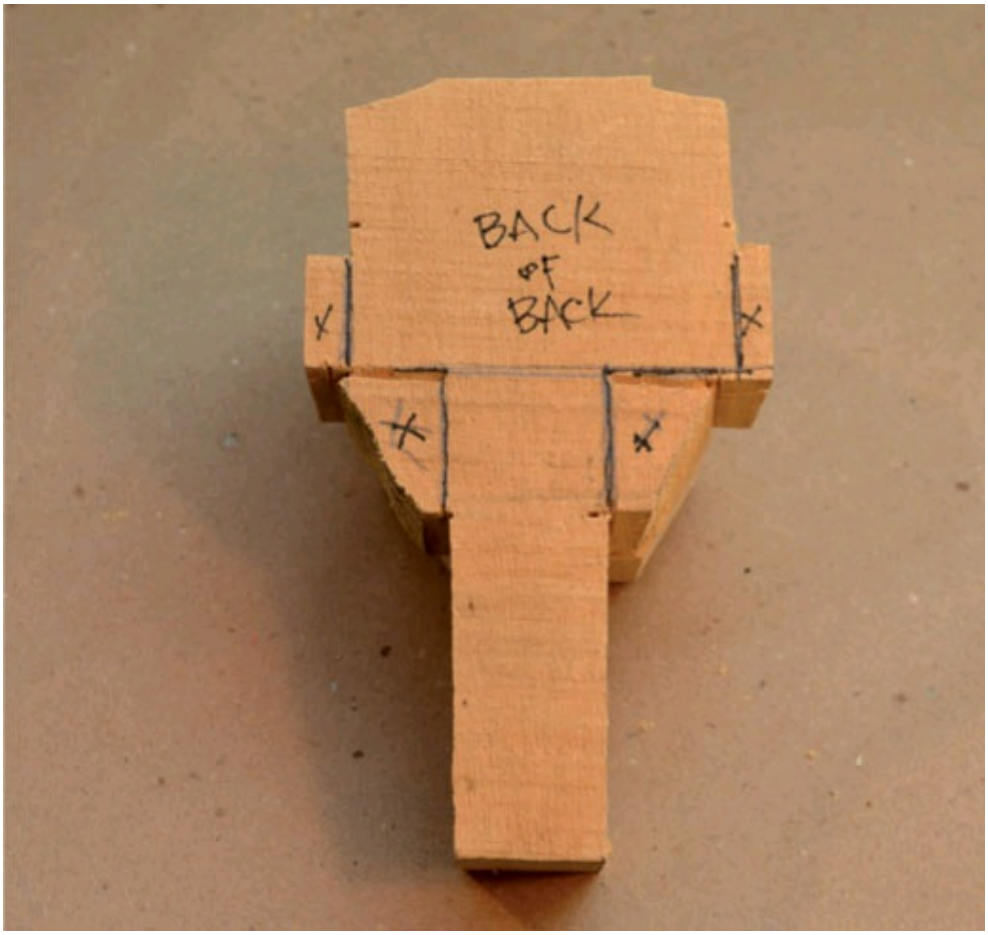
2. Clamp wood in vice. Saw down lines you can reach with a large saw, keeping saw vertical. Lines from below ears to chin need to be cut using your coping saw.

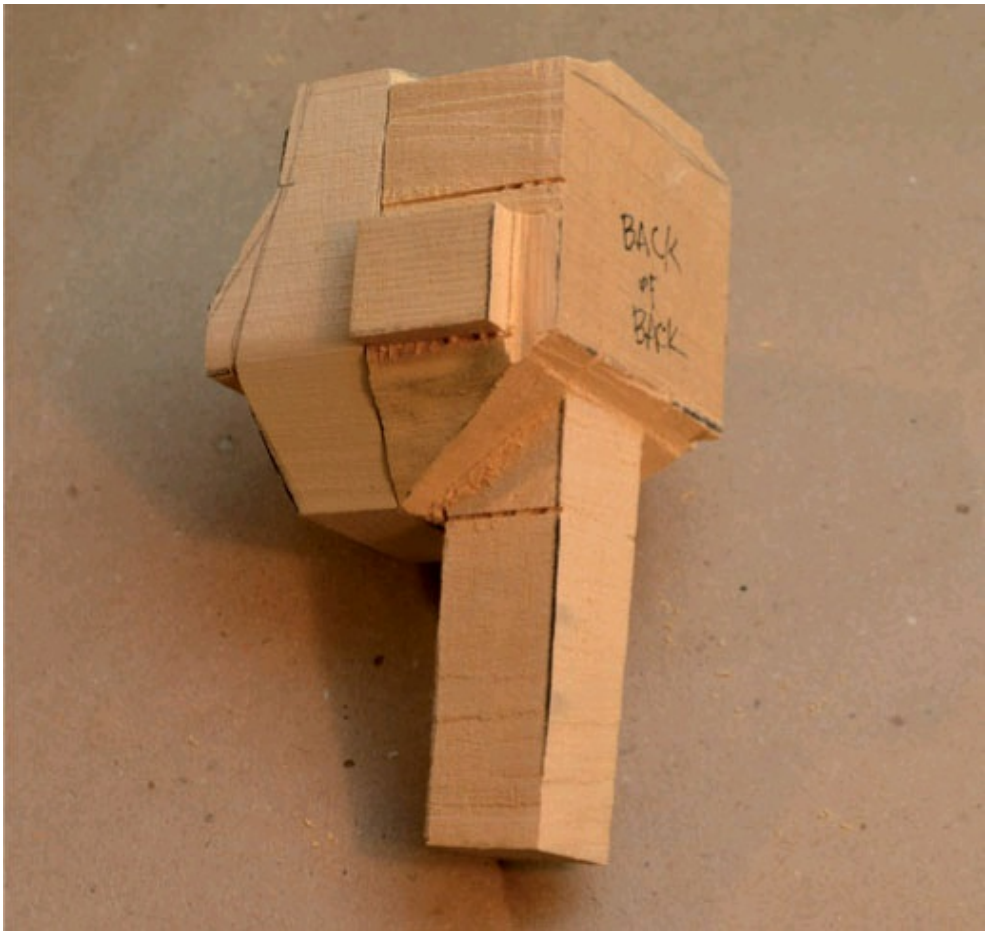
Step 3.

3. To make the puppet lighter, sections are drilled out to make them

hollow. Put a tape flag on a 15mm Forstner drill-bit as a depthgauge: 12mm deep for back of head, 20mm deep for front of head. Drill down at bradawl marks, with drill set on fast, pushing down hard. Once a little way in, lean the drill one way then another; this will speed up drilling. With your gouge, clean out the drilled hollow, as shown. Also gouge out a sloping area as marked on head back, carving from the dotted line down to the depth of the drilled holes.




BACK
of
BACK

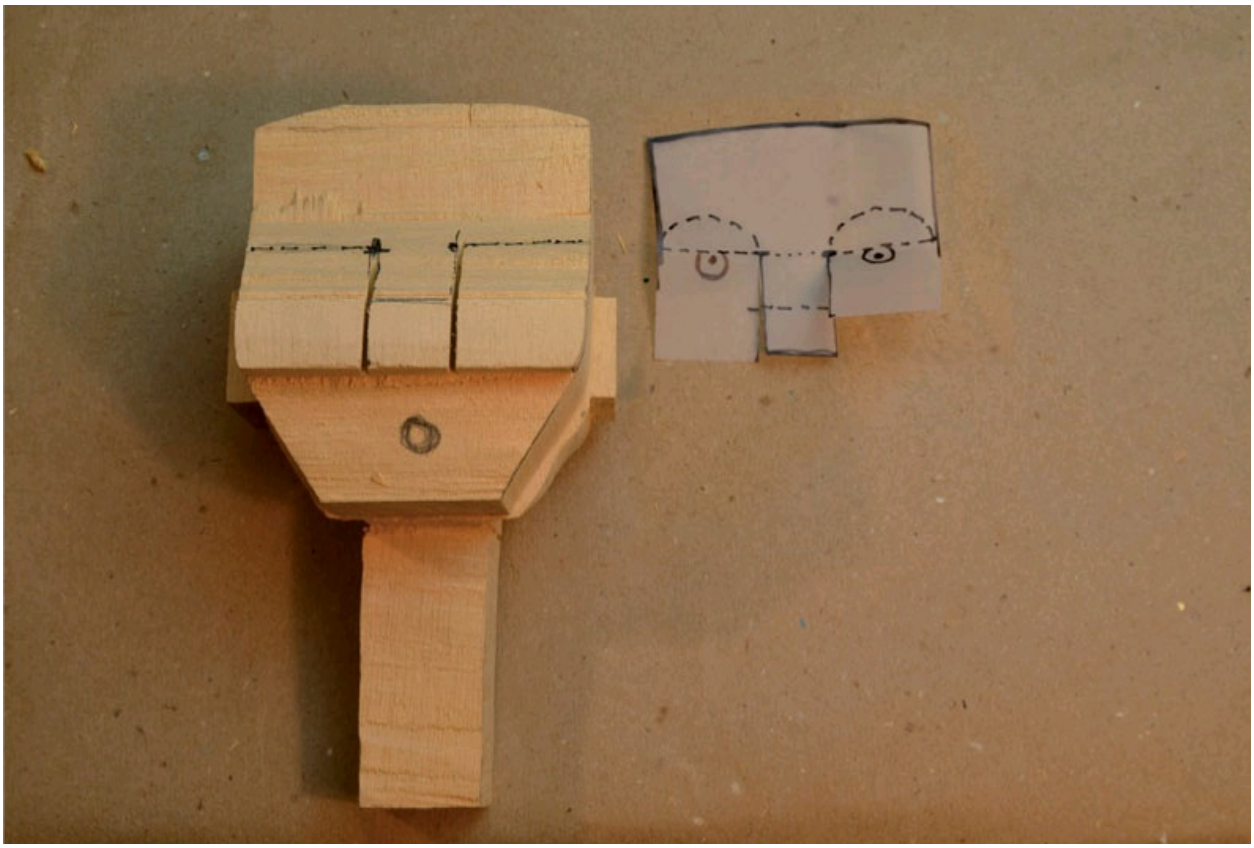


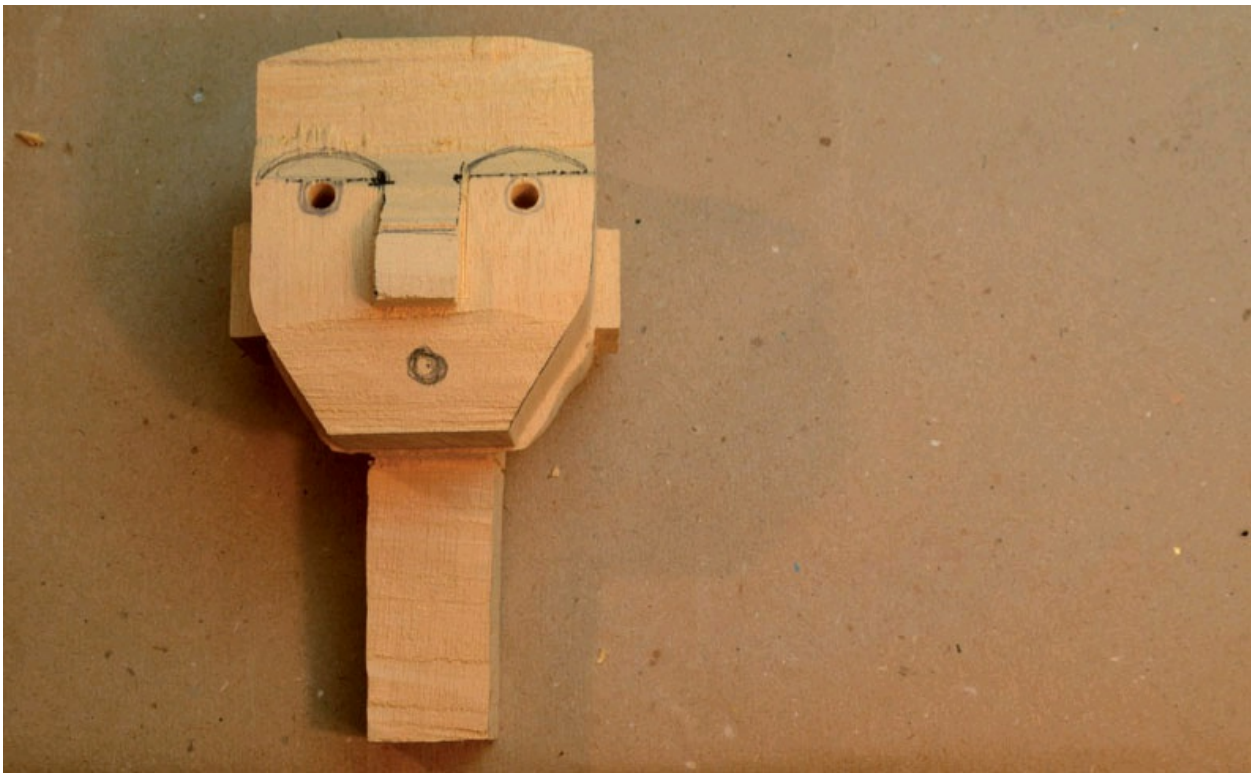
Step 4.

4. Transfer HEAD SIDE design to wood. Use a scrap of thin card as a ruler to draw some of the lines. Saw off excess wood till you have the head roughed out as shown.

Step 5.

5. Use the sanding board to flatten the joining surfaces of the head-halves. Apply PVA glue. Spread it with a scrap of card. Press the head tightly together by hand, keeping pressure for a minute. Clean off glue with a dry tissue. Place on a flat surface for five minutes to let the glue start setting. Then clamp gently in the vice, checking head halves do not slide out of alignment. Leave overnight to dry.



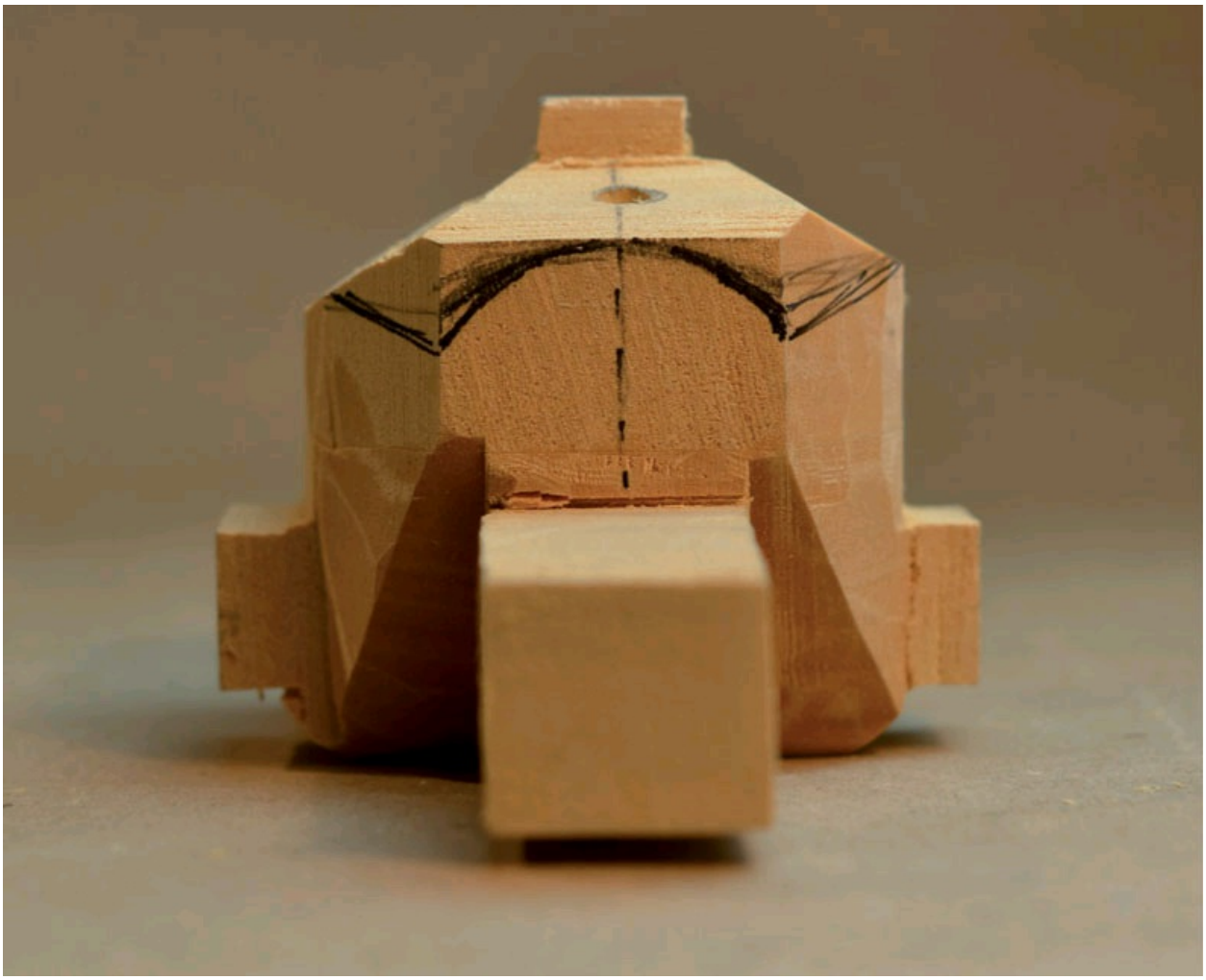


Step 6.

6. Trace template for NOSE & EYES onto the head. Saw down the sides of nose, being careful not to saw too deep. Chisel away areas next to nose, being careful not to cut into the nose. Drill 5mm holes any depth for eyes and mouth.

Step 7.

7. Gouge shallow hollows for eyes, carving as you did on your test spoon shape; working from the outside of the shape down to the drilled hole. From top of head, draw a gentle curve across the forehead. Use the flat chisel to carve forehead, working towards the top of the head. Carve cheeks working down towards the chin. Deepen eye hollows with gouge.



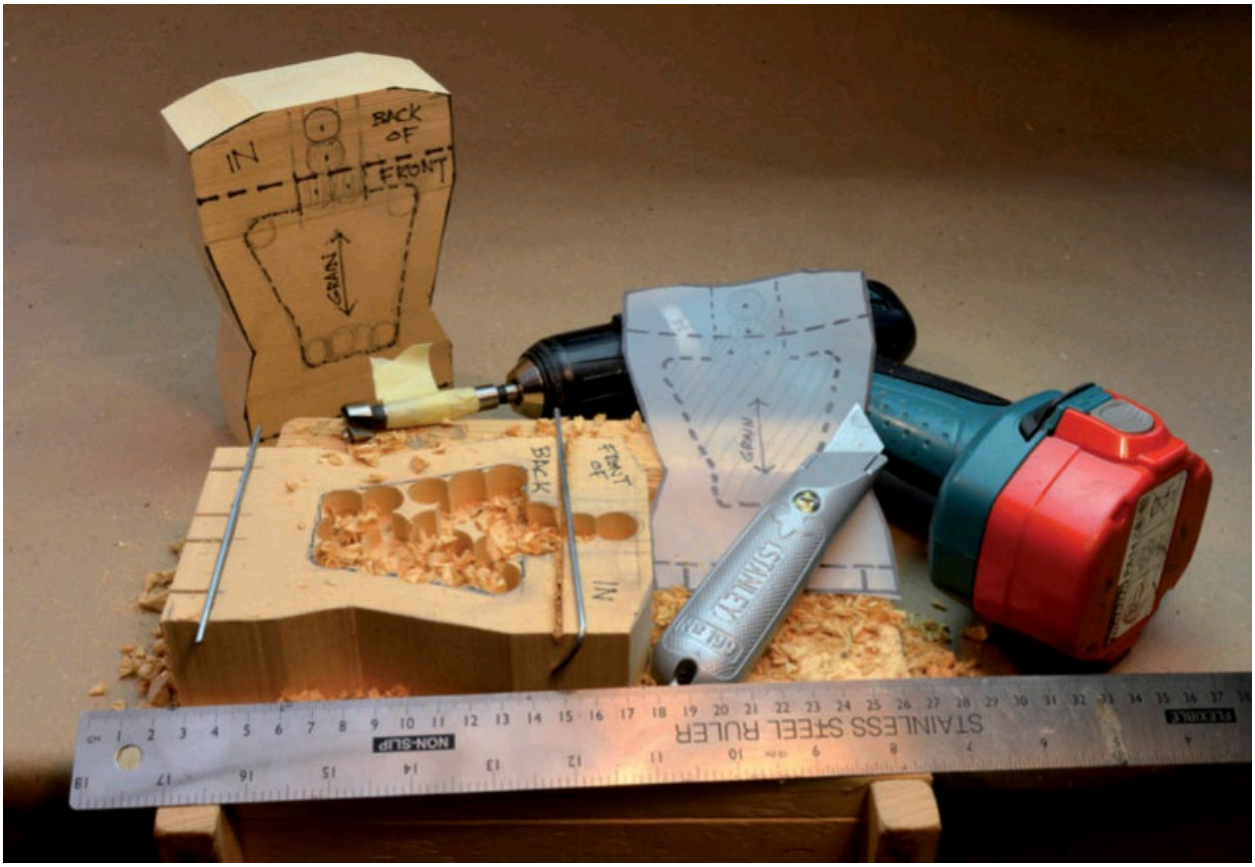
Step 8.

8. Draw a gentle curve under chin. Carve chin area, working towards the chin.

Step 9.

9. Carve ears into curved forms. Round the neck. Be careful that the wood does not split; carving so close to the grain direction is always difficult. If it starts splitting, carve in the opposite direction or carve across the grain. Clamp head in the vice for any tricky areas. Carve top of head into a gentle curve when seen from the side. This is difficult carving as you are on end-grain. Carve from the edges towards the middle of the end-grain, never from centre out.

Carve the body: Step by step



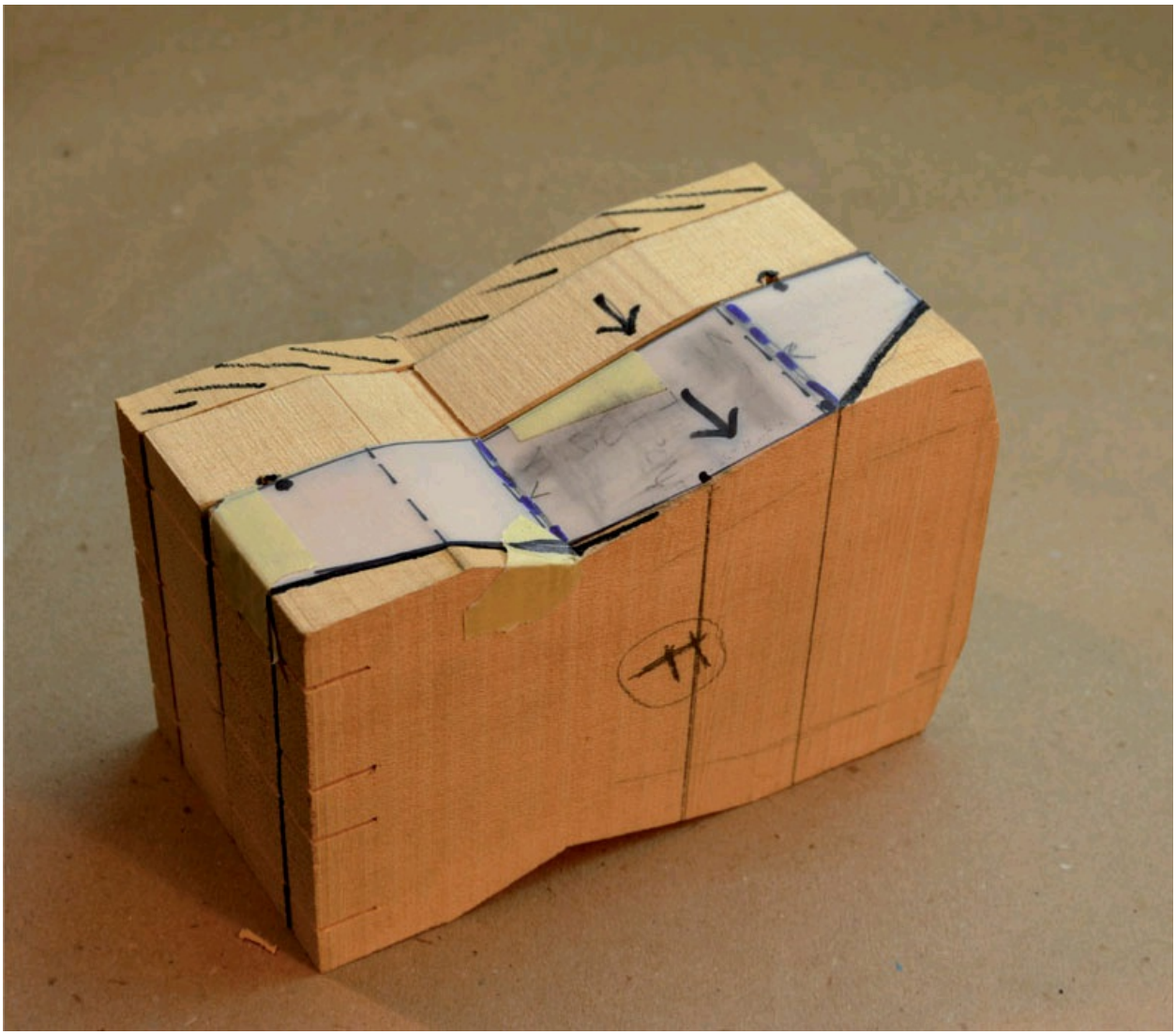
Carve the body – step 1.

1. Transfer BODY template onto the wood twice. With your large saw, cut the outline and four cuts in at the hip. Cut a wire coathanger to make a head wire 13cm long, and a leg wire 12cm long, bending an L at one end of each. Use a craft knife and a metal ruler to cut grooves for these wires. The grooves need to be deep enough for the wires to be sandwiched between front and back halves of the body. To hollow the chest, drill with a 15mm Forstner: 12mm into eight points marked with an X for the neck, 22mm into the chest, and 12mm into the back.


FRONT
OF
IN
BACK

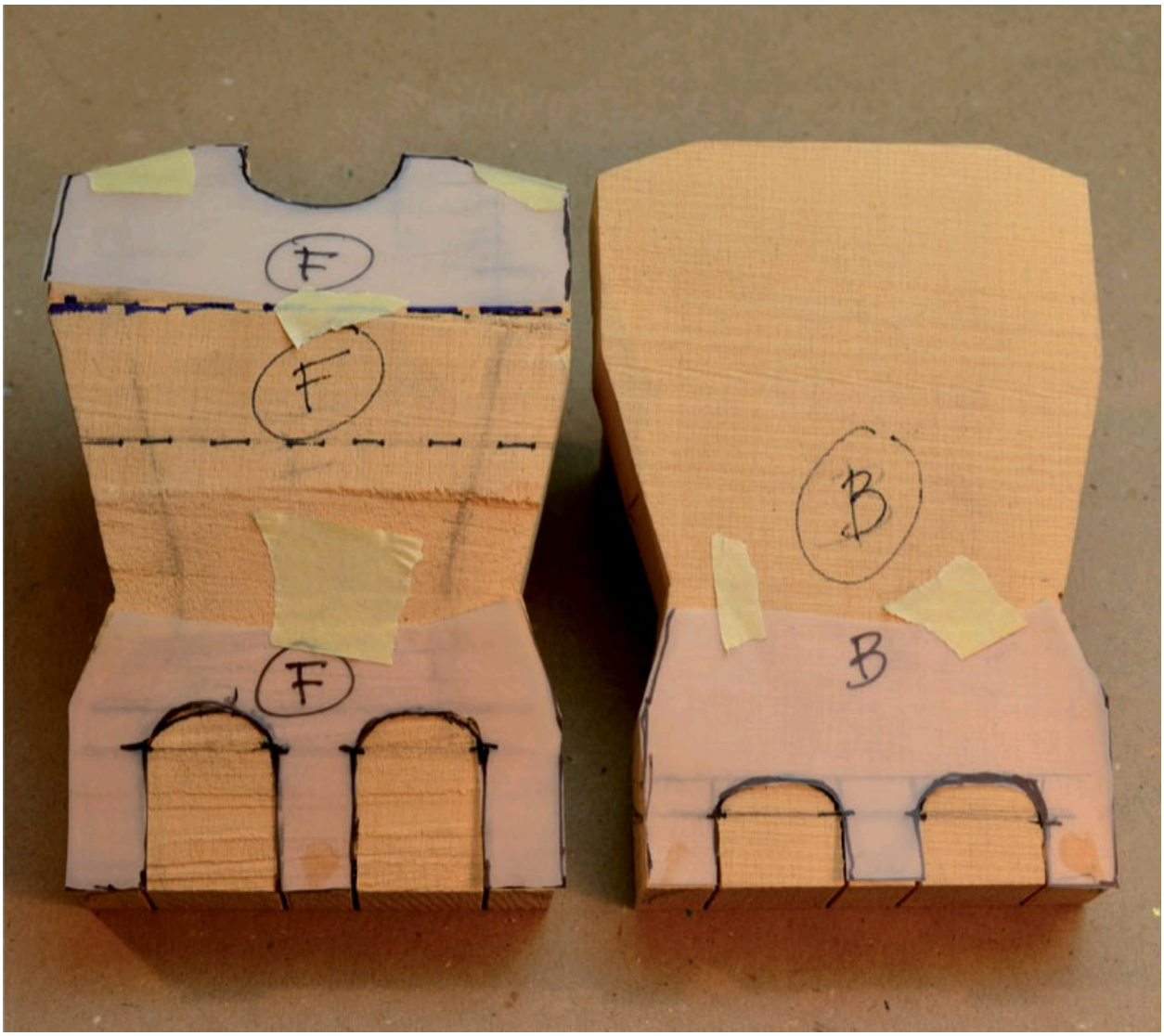
Step 2.

2. Mark the NECK HOLE from the template onto top of body pieces. With the body pushed against a bench-hook, carve out the neck holes with your gouge, to make a hollow tube shape. Gouge away wood from drilled areas.



Step 3.

3. Transfer SIDE OF BODY design from template to the wood, folding the tracing along the dotted lines, so the paper lies flat against the wood. Saw off excess.



Step 4.

4. Transfer NECK, HIP and BACKSIDE drawings from template to the wood. Label the body carefully so you know which the front and back is. Enlarge the neck-hole at the front of the body, to the drawn neck curve, by gouging from inside towards the end-grain. Sand the neck hole, till it is smooth, with medium and fine sandpaper wrapped around a dowel.

Step 5.

5. Glue and G-clamp the front and back together. Clean the surfaces to be glued first on the sanding board. Put the wires into the grooves, so as to keep these clear of glue, with ends sticking out. Clamp in vice and leave to dry.

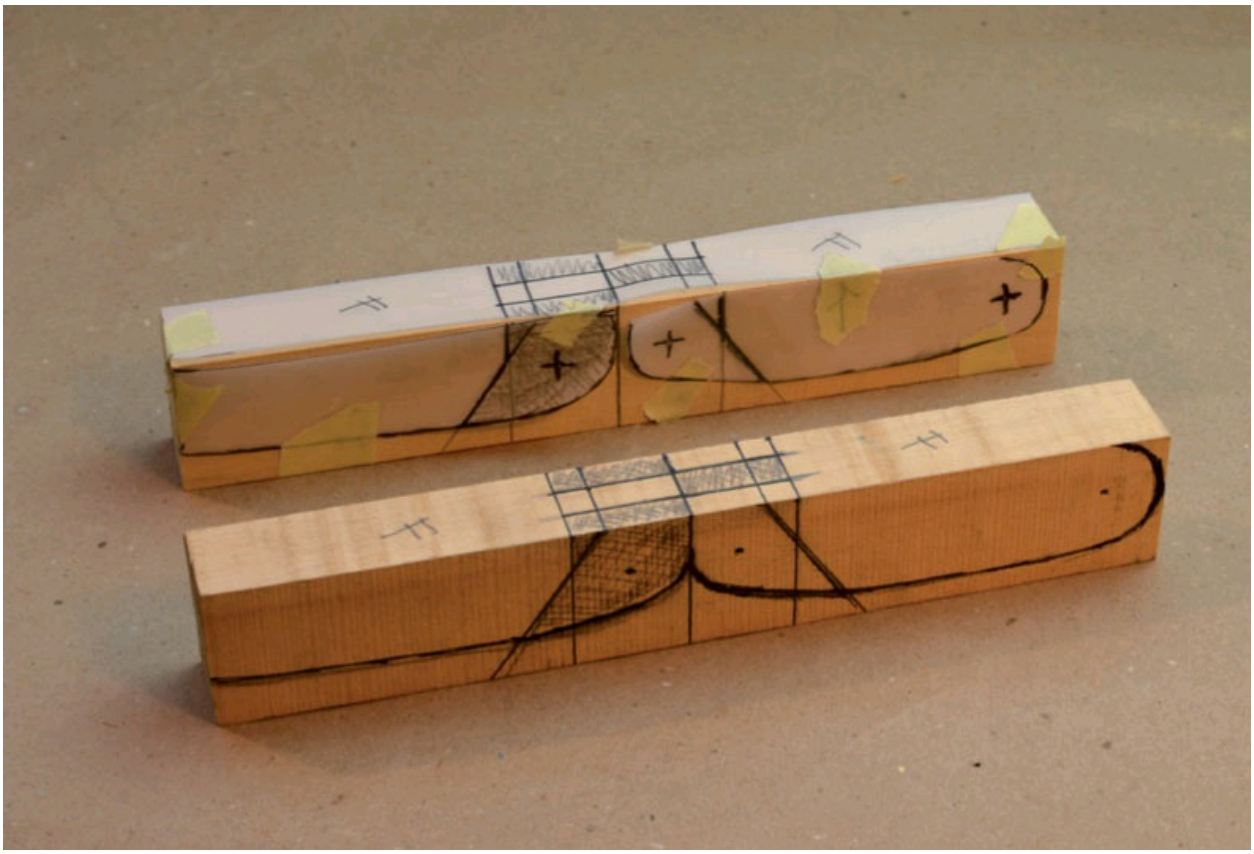
Step 6.

6. Pull wires out with pliers. With a coping saw, cut away two sections of the hips as shown. Note that the front is bigger than the back.

Step 7.

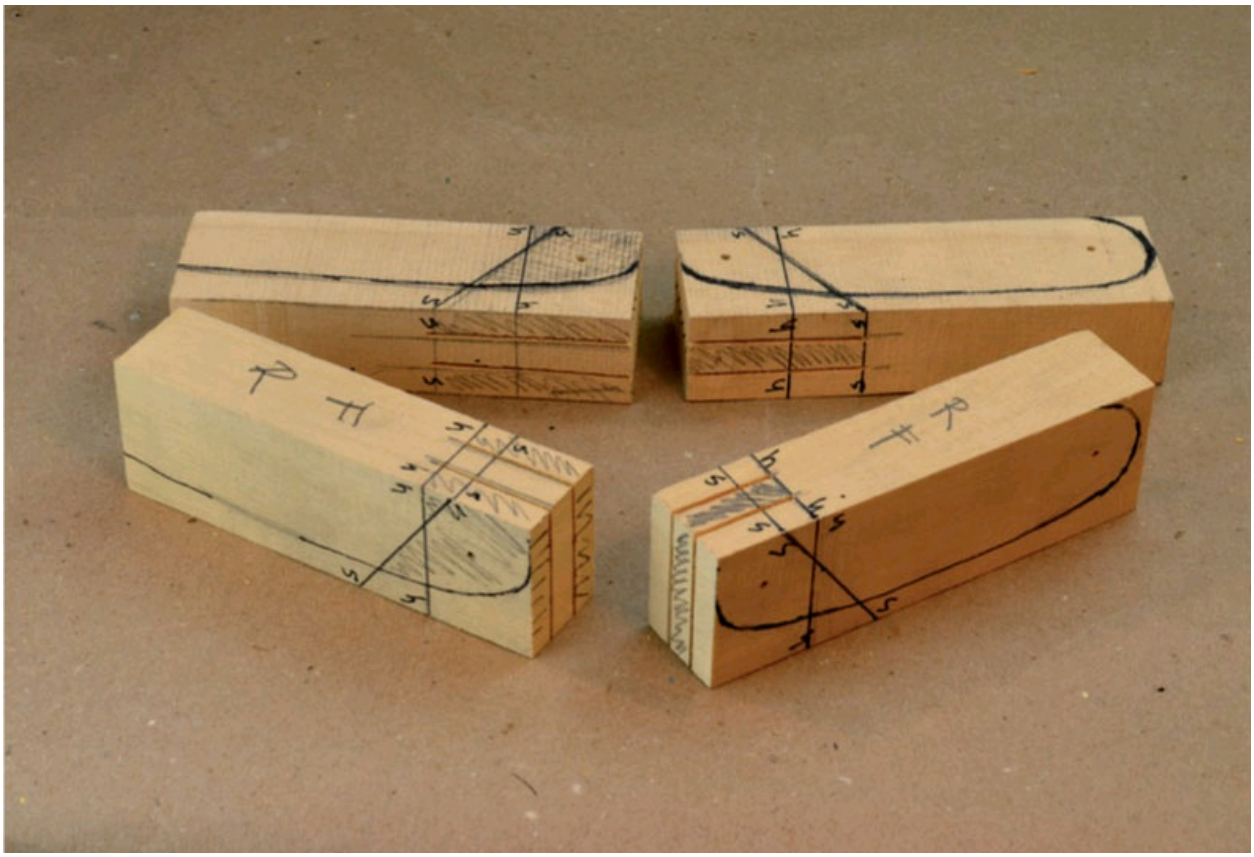
7. Mark dotted lines from templates onto the front, back and sides of the body. With your flat chisel, cut away the corners of the body till you reach the dotted lines. If you go deeper than the dots, you may break through to the hollow inside. Check that the neck fits loosely into the neck-hole.

Make legs: Step by step



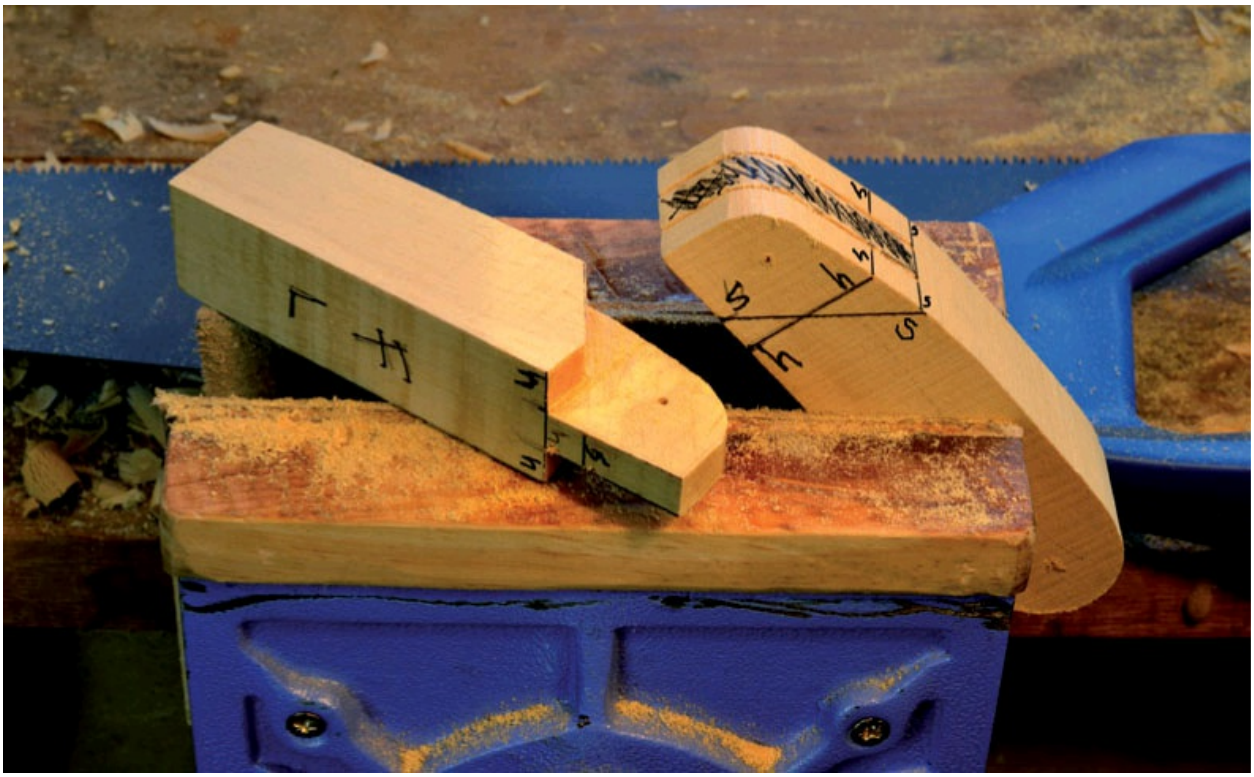
Make legs – step 1.

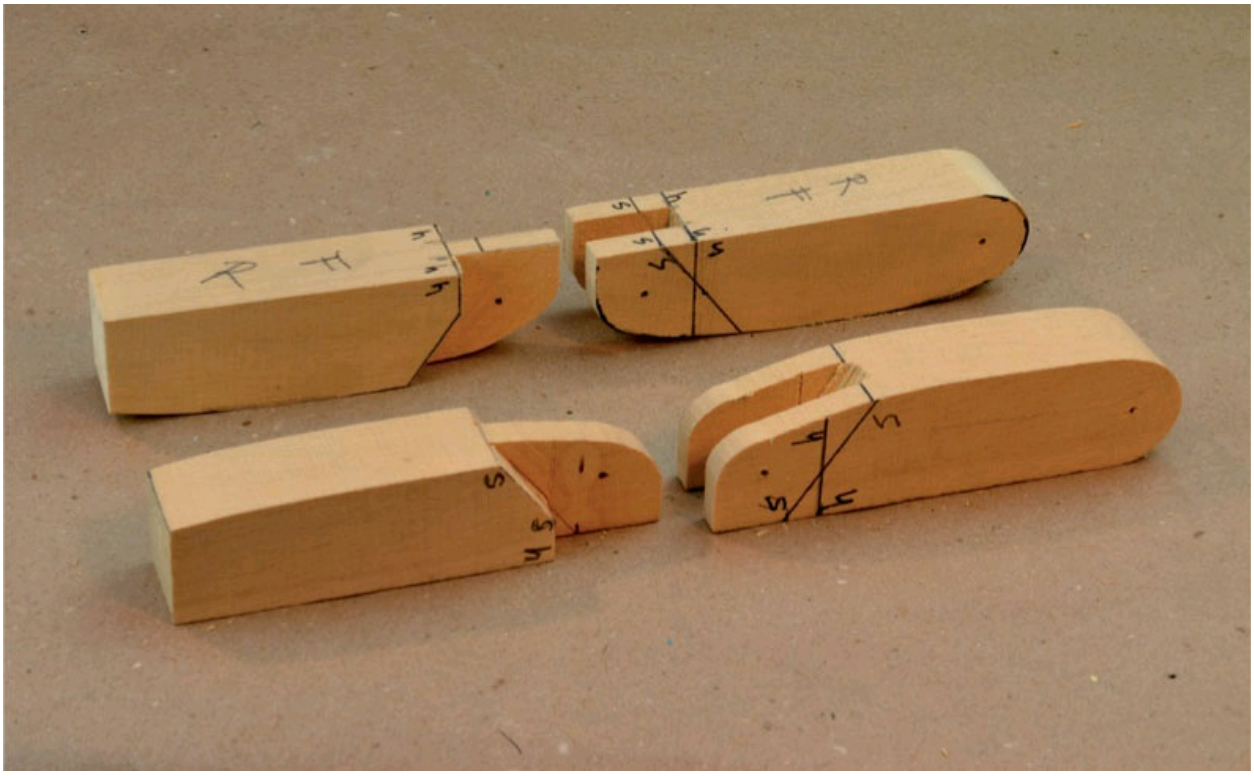
1. Saw leg block into two narrow blocks and sand well. Transfer FRONT OF LEGS and SIDE OF LEG drawings, with pivot points and lines, from the template to the wood, taking care to get the knee joint lines exactly as drawn.



Step 2.

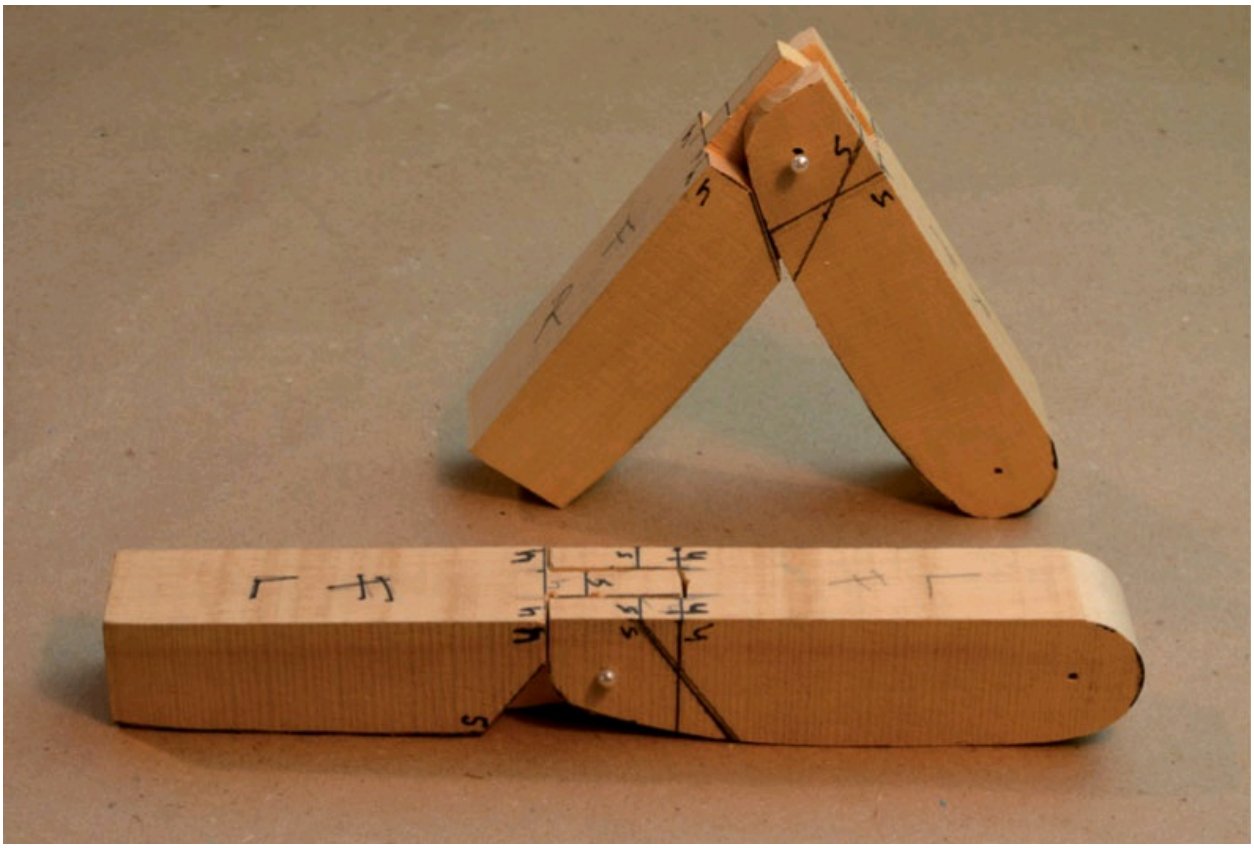
2. Label everything. Label left and right, and upper and lower legs. Saw apart and mark lines onto end-grain, using a try-square. Shade in areas to be cut away, as shown. Drill with 2mm drill-bit at each pivot point all the way through the leg, keeping the drill perpendicular to the side of the wood. Coping saw the side views. Transfer pencil lines around the backs, label and shade. A cardboard scrap is useful to draw lines on the curved surfaces.





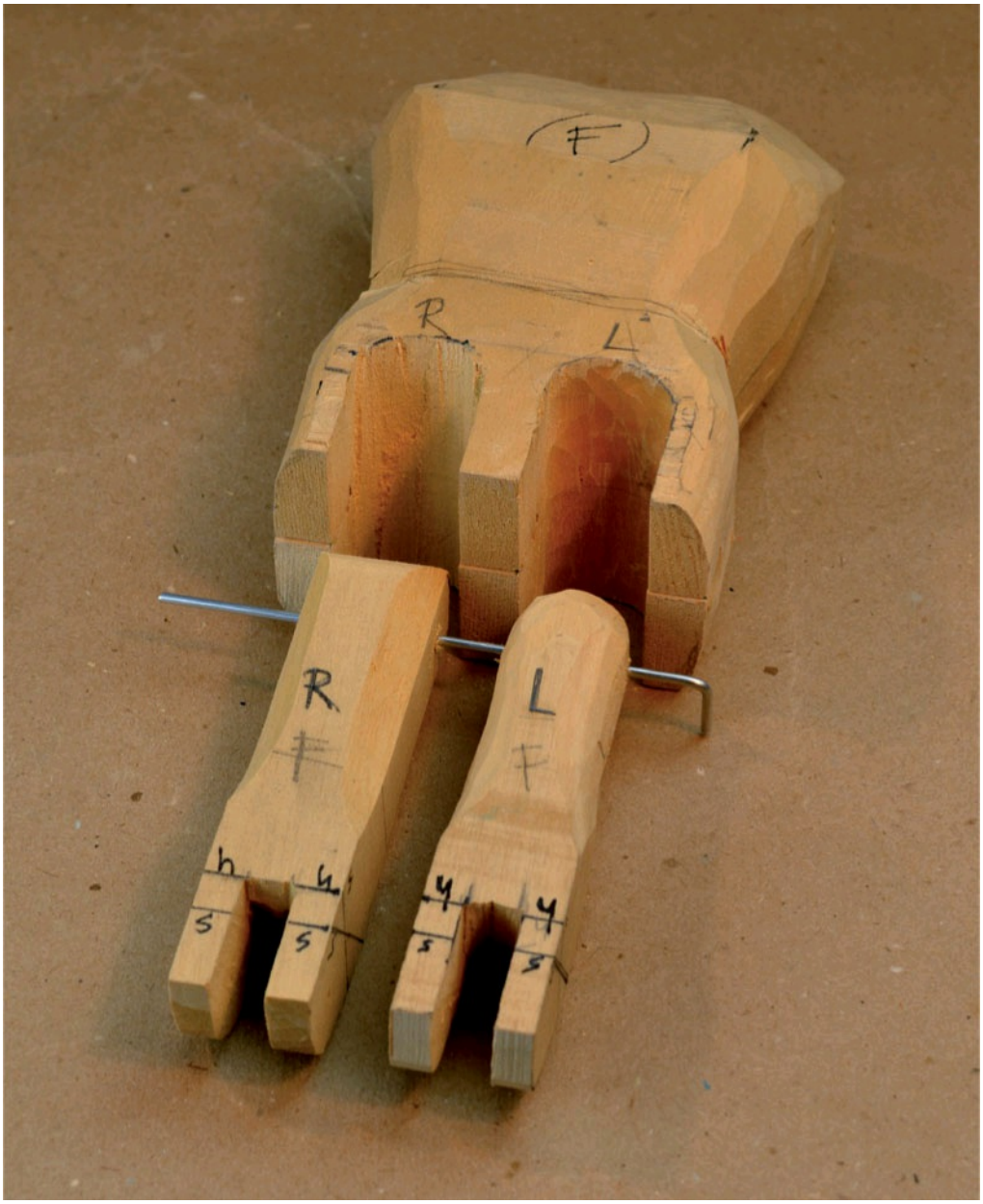
Step 3.

3. For upper leg: clamp in vice with a side facing you, as shown, so line s–s is horizontal. With your large saw, cut down the lines on the back, *on the lines*, stopping at lines s–s. Make sure the saw can touch both front and back marks at the same time. Re-position leg in the vice and saw down the same lines but stopping at lines labelled h–h. Clamp the leg upright in vice and use a coping saw to carefully cut away the shaded area. Start cutting down the vertical saw-cuts, and gently rotate the saw, while sawing, until you are cutting horizontally. Cut away the sloping area, then cut away small remaining section. Clean slots with your gouge, angling it to get into the corners, or use sandpaper wrapped around the end of a slot screw-driver. For lower leg: clamp in vice with a side facing you, so line s-s is horizontal. With your large saw, cut down the lines on the back, *outside the lines*, stopping at lines labelled s–s. Then saw down to horizontal lines labelled h–h. Saw off the shaded areas with a coping saw, being very careful not to over saw. The little horizontal area needs to be exactly as drawn, to prevent the leg bending the wrong way.



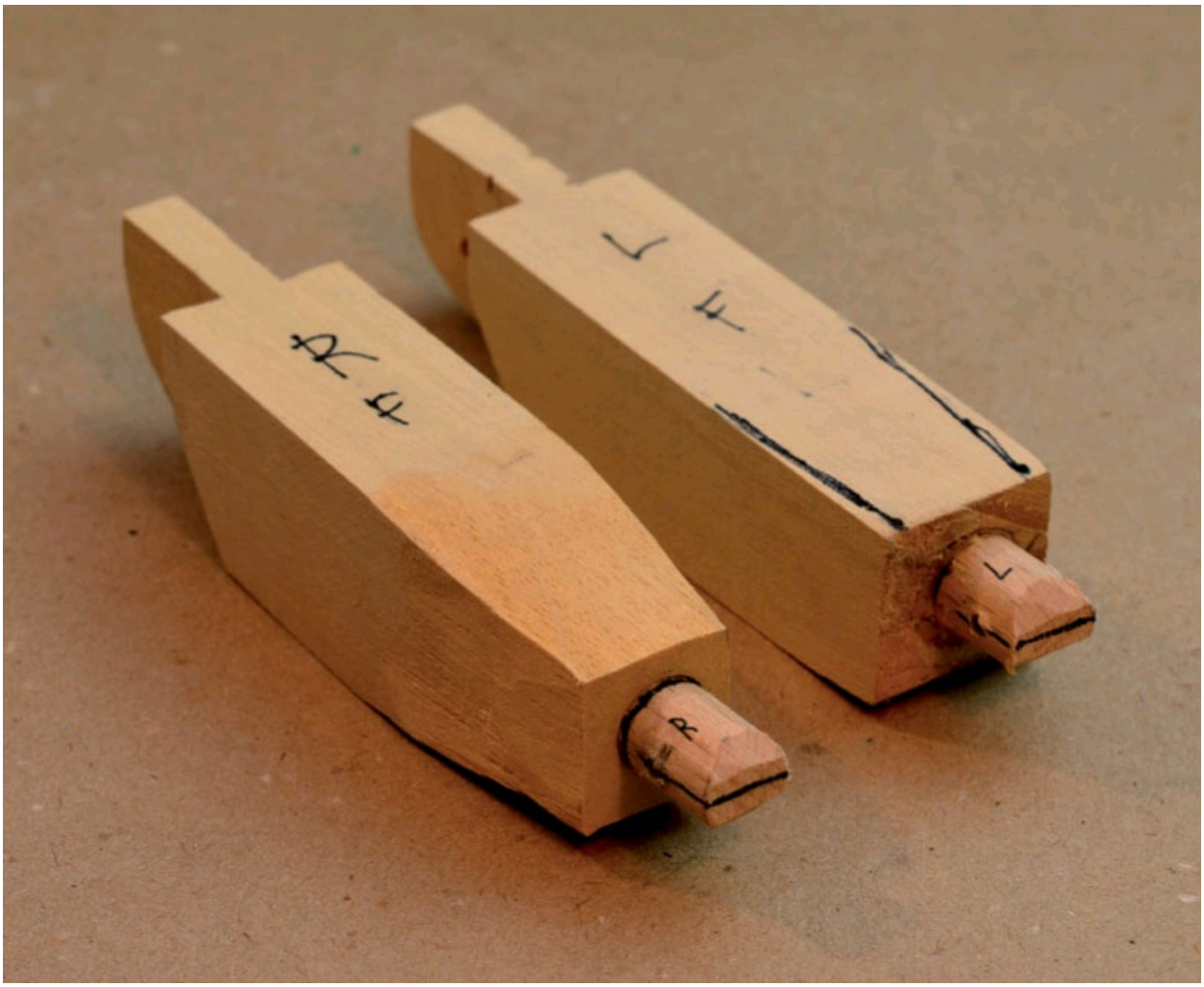
Step 4.

4. Try to assemble. With leg bent, look for light through pivot holes. If you can see a speck of light, slip a large-head pin through the holes. Try straightening the leg. If it will not straighten, carve or sand small amounts away, until it fits loosely. This joint must be very loose. Repeat with the other leg.


R
L
R
L

Step 5.

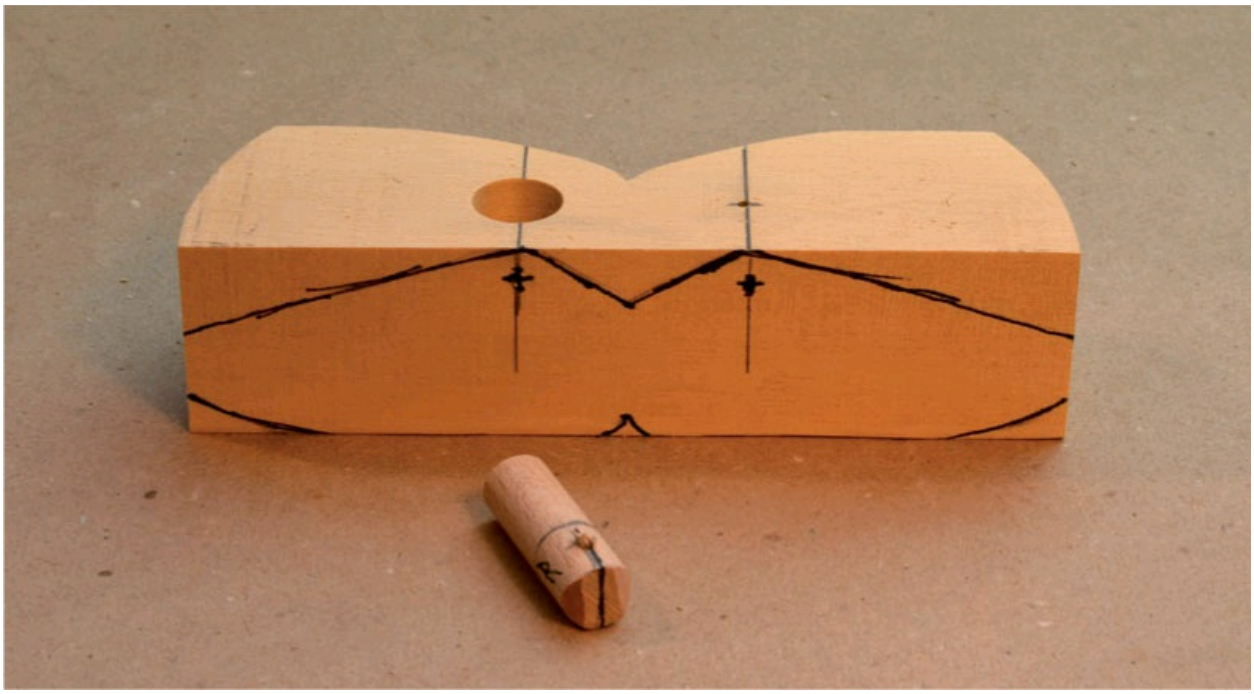
5. Enlarge hip pivot holes through the top of the legs using a 4mm drill. Round tops of legs with your flat chisel to fit into the hips. Enlarge hip-hollows very slightly with a gouge, chiselling from the front to the back. Smooth hollows with sandpaper wrapped round a dowel. Keep going until the legs can be fitted onto the wire threaded through hips, and legs can swing very freely backwards and forwards without getting stuck.



Step 6.

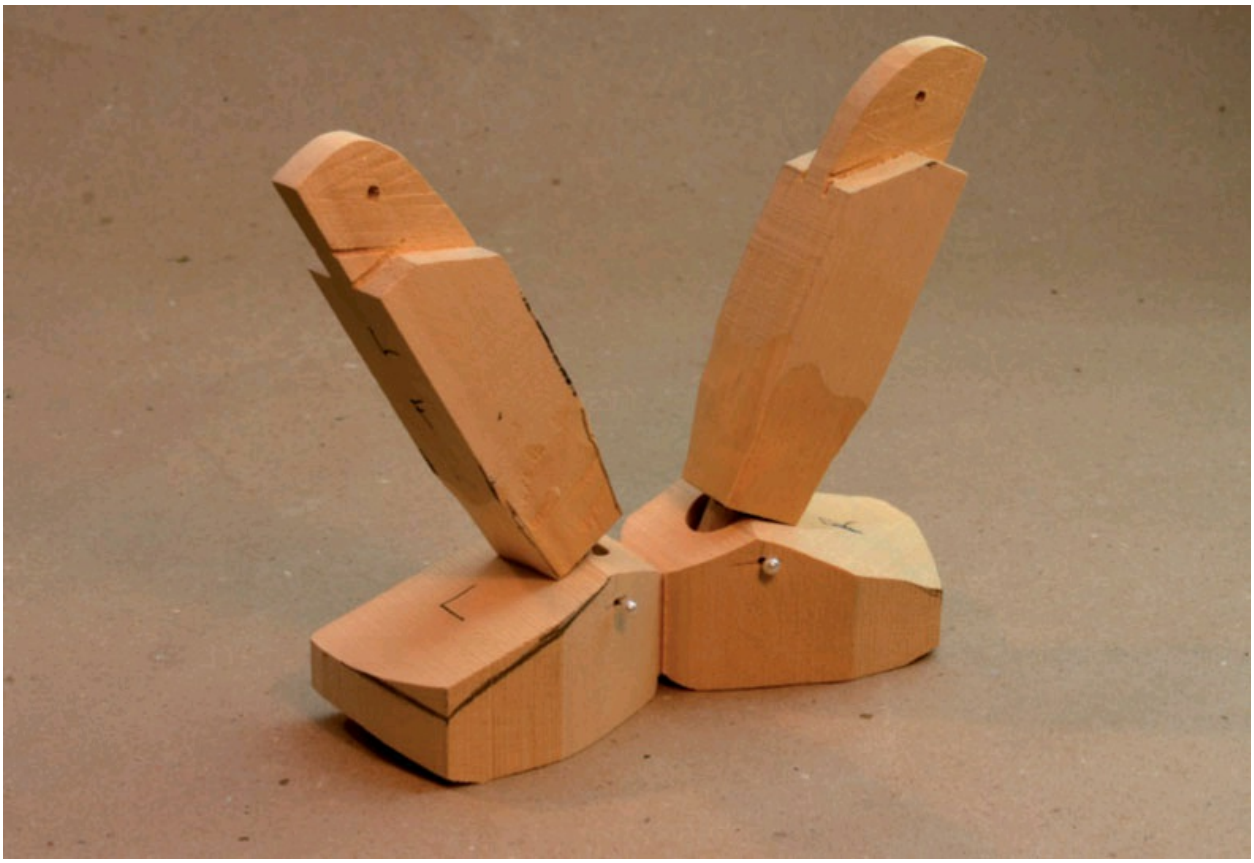
6. Drill 25mm deep into the centre of the lower legs at the ankle with 12mm Forstner. Mark a slight narrowing to the ankle and carve away. Cut 12mm dowel: 2 x 38mm. Push dowel all the way into the ankle hole, leaving 13mm sticking out. Mark the dowel's depth and which leg it is for. Pull out dowel and mark a line down the sides and around the end. Drill through dowel 6mm from end with 3mm bit. The lines should help you drill through the diameter of the dowel. Round the end of the dowel slightly, from front and back, as shown. Push dowel back into leg, up to depth-mark. Repeat with other leg.

Make feet: Step by step



Make feet – step 1.

1. Transfer SIDE OF FEET drawing and pivot points to the foot block. Mark position of ankle hole centres on the top. Use a try-square to check side pivot holes align with the centre of ankle holes. Drill 2mm holes through the feet at pivot points, keeping the drill perpendicular to the wood. Drill 25mm deep with 15mm Forstner into top of feet. Coping saw out the side view.



Step 2.

2. Draw TOP OF FEET onto wood and saw. Pin on the legs to check there is very loose movement at the ankles. Shape each foot by carving a slope down towards the toes to the line shown in the photograph. Saw the feet apart and chisel the backs into a curved shape. Sandpaper the end-grain areas.

Assemble the legs

Carve off the edges of the legs as shown.

Assemble legs onto hip wire, and use short lengths of florist wire through the knee and ankle joints, with ends bent over, to see what the whole leg and foot assemblage looks like.

Carve away the square corners of the legs.

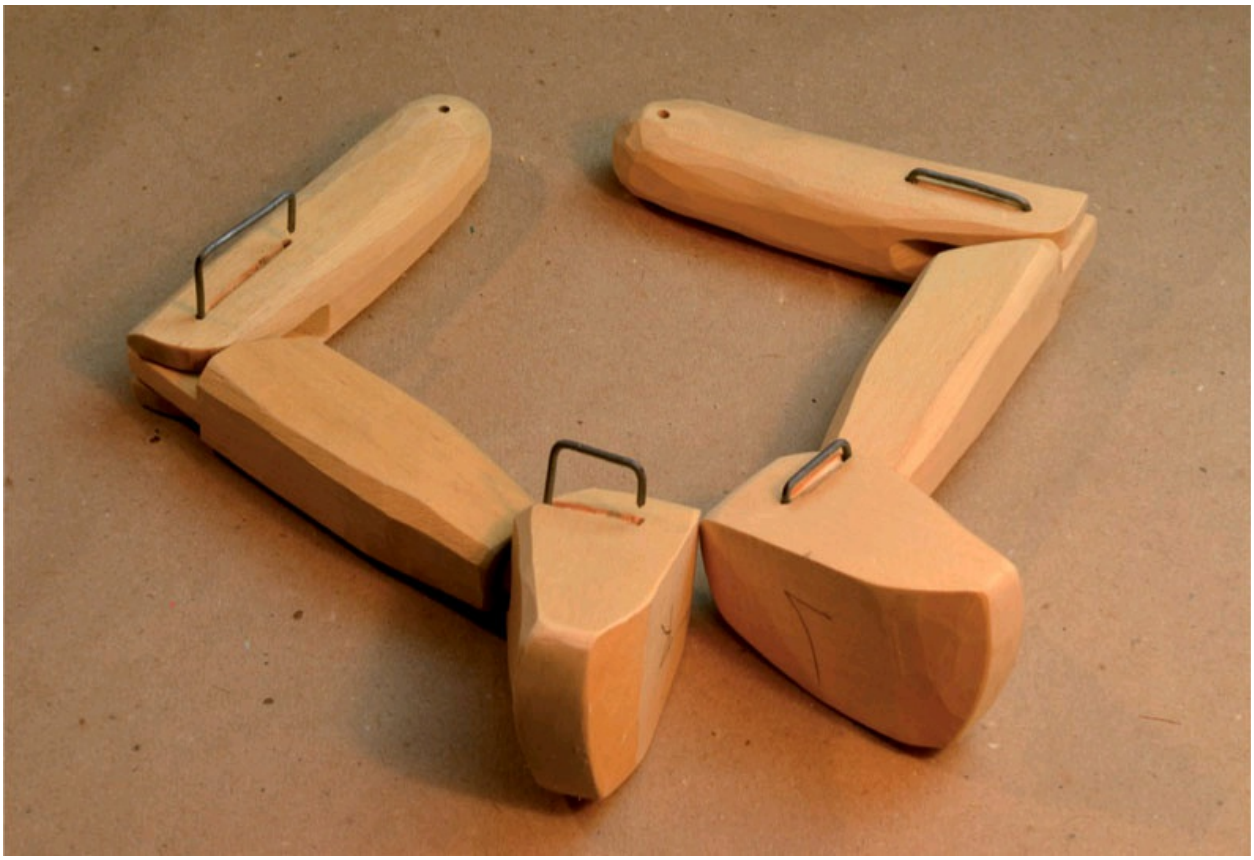
Legs and feet are temporally assembled.

Enlarge knee-joint holes to 3mm in lower legs only.

Straighten 1.6mm wire, using pliers and hammer. Cut four bits, each 62mm long. Bend into large staples for ankles and knees: *see* template.

Assemble knees and feet using these staples, pushing the staples in from the inside of the legs. Mark where the short leg of staple reaches; make a bradawl hole 5mm deep. With a craft knife, cut a groove between the drilled pivot hole and bradawl hole. Push staples in, so you can still pull them out with pliers. Check the joints are working smoothly without

jamming. You can enlarge the grooves in the knee joints with the flat side of your chisel and with sandpaper.



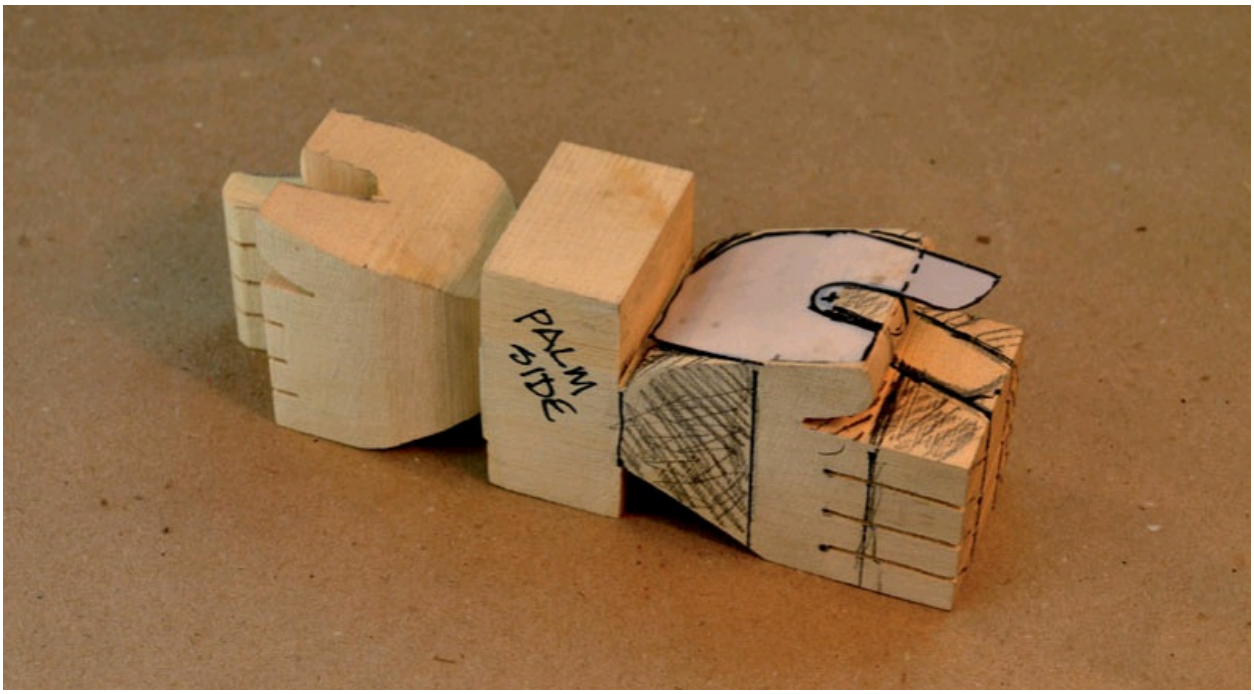
Legs with grooves and wire staples.

The assembled legs and feet with staples not fully hammered in.

Assemble legs onto hip wire. Twist feet in or out until they do not crash against each other. Take feet off and mark orientation of pegs. Take apart and glue the pegs in with PVA, aligning to the depth and angle marks.

I have rounded the puppet's bottom slightly, seen from the side, as well as the front side sections of the hips.

Carve hands: Step by step

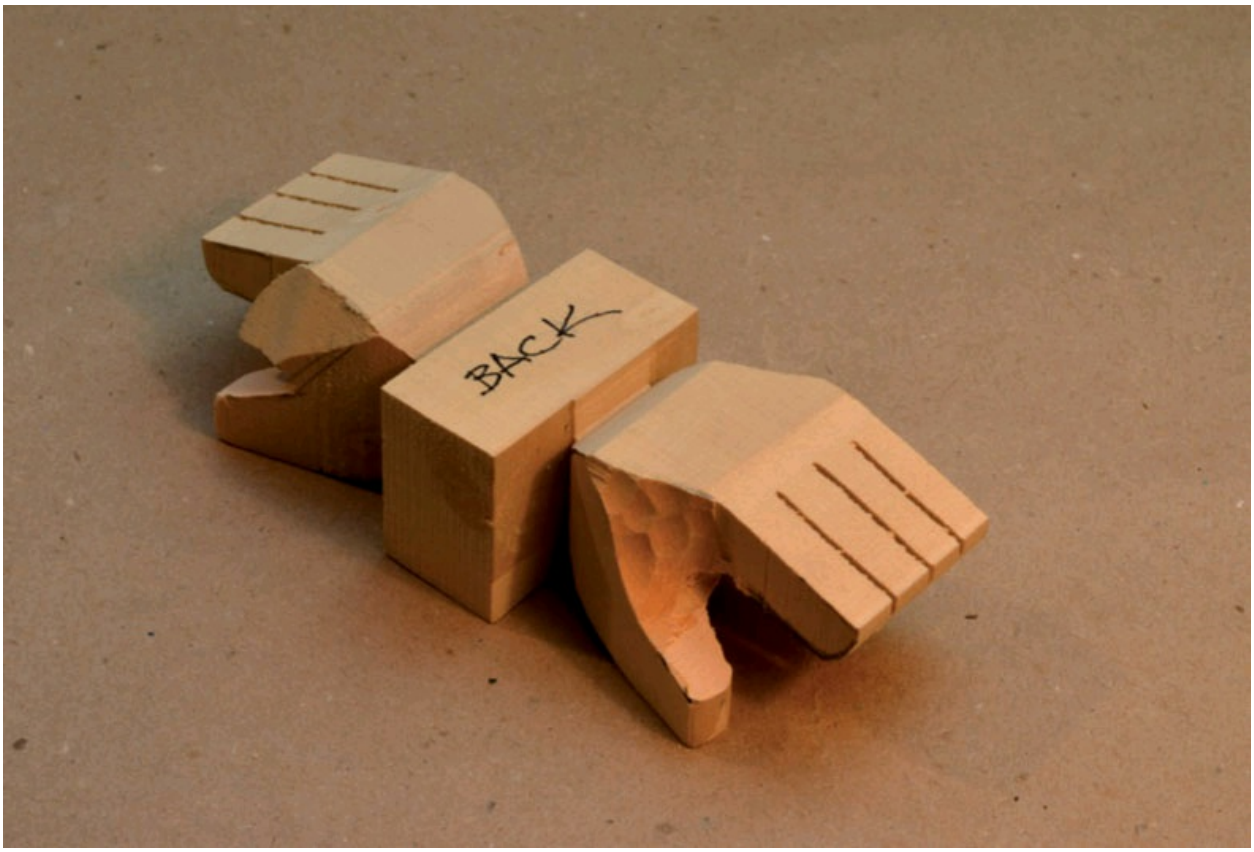


Carve hands – step 1.

1. Transfer PALM OF HANDS design to wood and coping saw the outline. Use a large saw to cut the lines between the fingers. Transfer HAND SIDE to the wood and shade as shown.

Step 2.

2. Clamp the hand in the vice by its holdingblock. Never clamp across the fingers or thumb as they may break. With the coping saw, cut the side shape of the fingers, thumb and outline of whole hand, taking away the shaded areas shown in the photo. Draw a curve for the hollow in the palm. Chisel a hollow using your gouge, hitting the end of the handle with a mallet or a block of wood. Using a mallet gives great control. Work down towards the fingers.



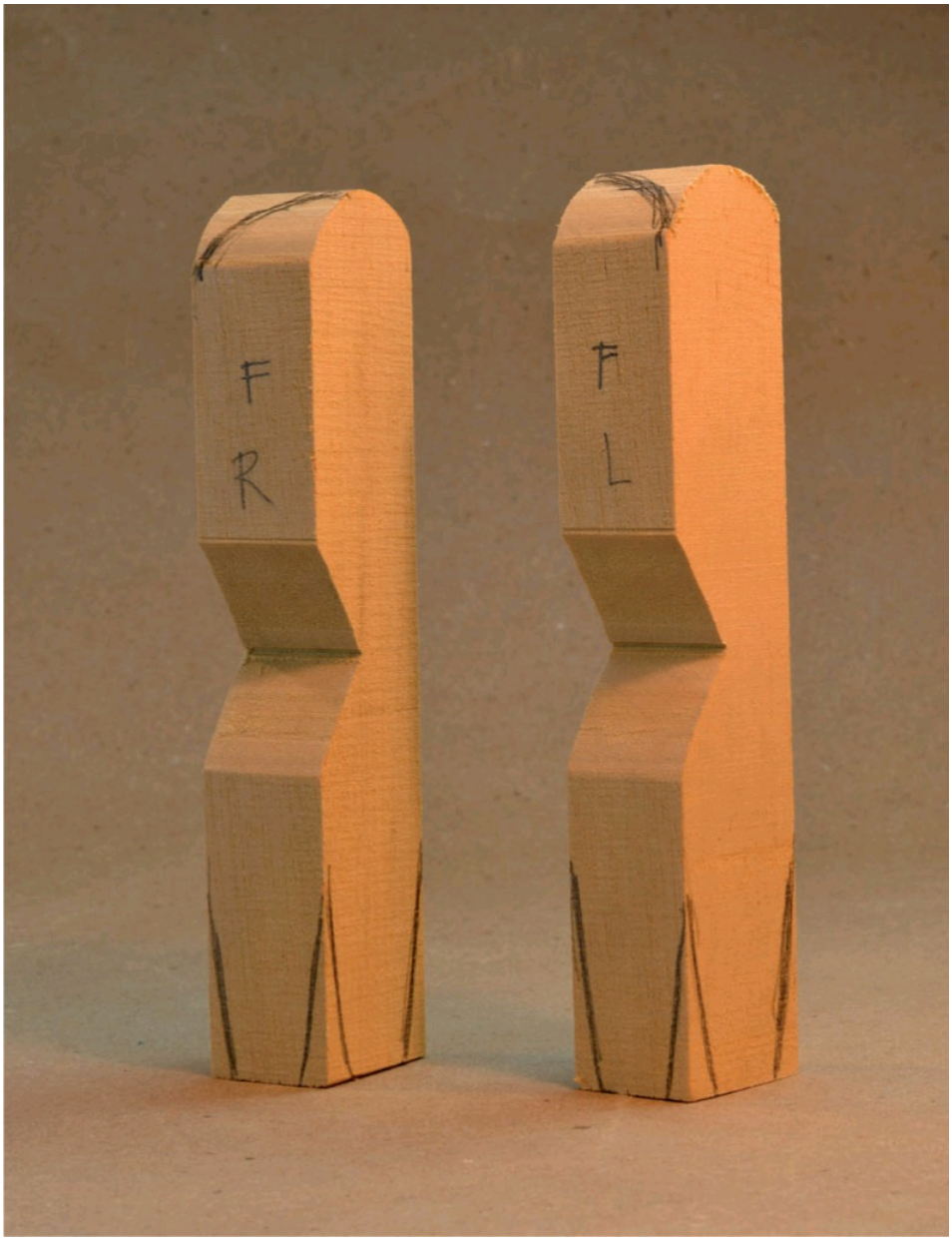
Step 3.

3. Work on the back of the hand – carve area away between thumb and fingers with your gouge.

Step 4.

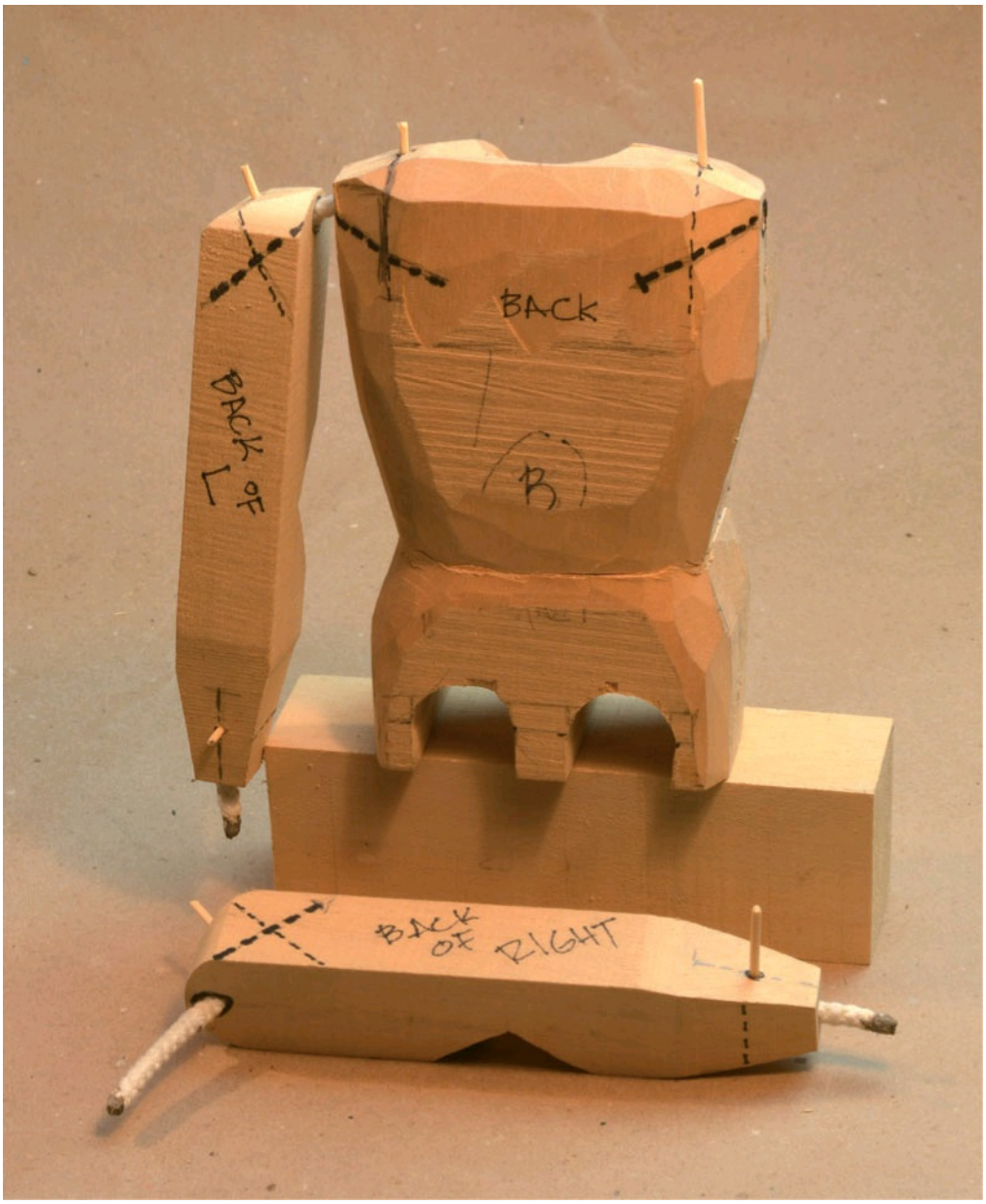
4. Refine the hands, chiselling carefully, and finish with some fine sandpaper to smooth the hollows. Saw hands off block and smooth the wrist area with sandpaper.

Make arms: Step by step



Make arms – step 1.

1. Saw arm block in two. Trace SIDE OF ARMS and saw the outline. Draw curves at the top of each arm, onto the front views and saw or chisel. Label left and right.



Step 2.

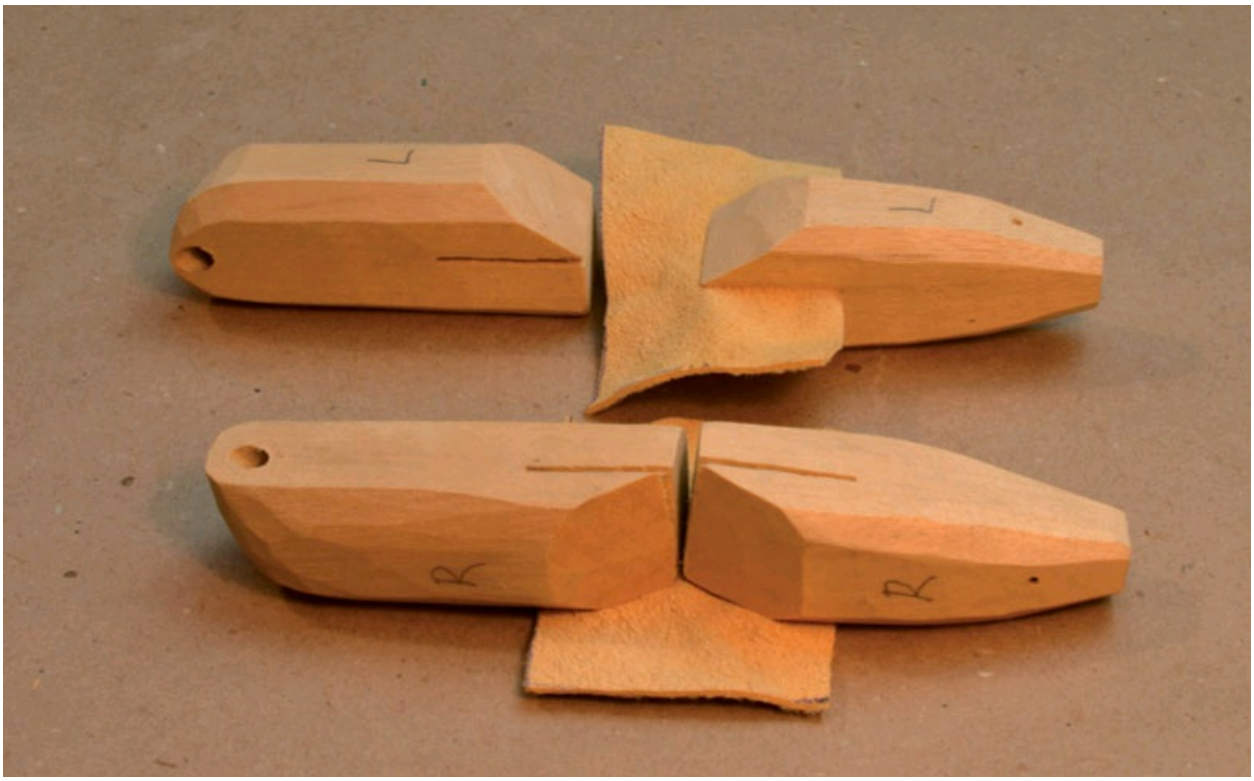
2. Drill holes for cords with 5.5mm drill into:

- Arms at wrist: 30mm deep.
- Hands at wrist: 15mm deep, clamping the front and back of the fingers gently in the vice.
- Shoulders as shown in photo: 30mm deep.
- Upper arm as shown: 30mm deep.

Drill for toothpicks with a 2mm bit: top of shoulders and arms, wrists and hands. These holes need to cut across the cord holes. The hand holes must come out the other side of hands. Holes in the lower arm should go all the way through.

Cut 4mm cord and burn ends: two x 45mm for wrists, two x 70mm for shoulders.

Cut a few millimetres off eight toothpicks with pliers. Push sharp end of toothpick into the holes to grip the cords temporarily.



Step 3.

3. Take out cords and toothpicks. Refine the arm shapes with your chisel, including slight narrowing at the wrist. Label upper and lower sections of the arms.

Saw across the elbow with coping saw.

Saw with your large saw 25mm deep slots, as close to the elbow bevel as possible. After sawing, chisel more off the bevel, if needed, so there is no wood between bevel and saw-cut.

Cut two bits of thin leather, 50mm x 70mm. Place lower arm in vice and check leather can be pulled into the saw-cut. If needed, use some folded sandpaper to enlarge the saw-cut slightly until the leather can be pulled into the slot.

Sand the arms at the end-grain.

With lower arm in vice, glue leather into the slot with UHU. Allow to dry.

Fix upper arm in vice and glue leather in. The upper and lower arms should fit tightly against each other.

When dry, cut excess leather off with a craft knife.

Step 4.

4. Put cords into wrists and place arms on your bench to align the hands as shown. Push toothpicks in. Leave enough of a gap at the wrist for loose movement; look at your own wrist to see how much movement there should be. Hammer toothpicks all the way through arms and hands. Cut off protruding bits with pliers and chisel smooth. Put shoulder cords into upper arms and hammer tooth-picks in, cut off and smooth.

Add hair

Decide what hair you want your puppet to have. Test out how you can attach it to the head.

I will describe what I have done. I have used bristles from a brush.

Drill into a scrap of wood to test how many bristles need to be in a cluster. Bind bundles of bristles with tape, dip the ends into PVA glue and allow to dry. As these harden, compress ends a few times, using your fingers. When dry, cut the bundles in two and peel off tape.

Making hair using bristles from a brush.

Work out a pattern for where the hair will go on the head. With the head in the vice, bradawl and drill. I used 6mm holes to take the hair.

Refine the puppet's head. Strop your chisels till they are very sharp, and

do a final carving of all surfaces of the head. Gouge hollows in ears. Where necessary use fine sandpaper.

Glue the hair in with UHU, and use the ends of matchsticks thinned down to wedge any bundles that are loose in the holes. When dry give your puppet a haircut.

Saw 25mm off the neck. Carve a slightly rounded end, and sand smooth. Screw a large 30mm-long screw-eye, all the way in.

Refine and wax

I have kept the puppet with a chiselled finish, but you can, if you prefer, sand all the chiselmarks away.

Strop your chisels well before refining all parts of the puppet.

Carve off pencil marks, or clean with a rubber. Label left and right inside the knee joints, so you do not put the wrong bits together.

Wax the puppet. See Project 1 for details.

Refined and waxed puppet parts.

Assemble

Assemble the puppet in this order:

1. Knees: hammer staples in.
2. Head: cut 6mm off the blunt end of a kebab stick, and glue it into either end of the wire hole with UHU. Cut the head-wire to 80mm long and push it through the body, catching the head screw-eye. Fix wire in with another bit of a kebab stick glued in. If needed, use a little plastic wood to fill any gaps.
3. Hip: cut the hip-wire to 75mm long. Push through hips and legs, using the same fixing method as the head-wire.
4. Arms: join arms onto shoulders with a 10mm gap, and hammer in shoulder toothpicks.

5. Feet: hammer staples in. Glue thin leather under the feet.

Make the control

Cut 14mm x 14mm pinewood into three lengths: 17cm for body-bar, 12cm for head-bar, 23cm for leg-bar.

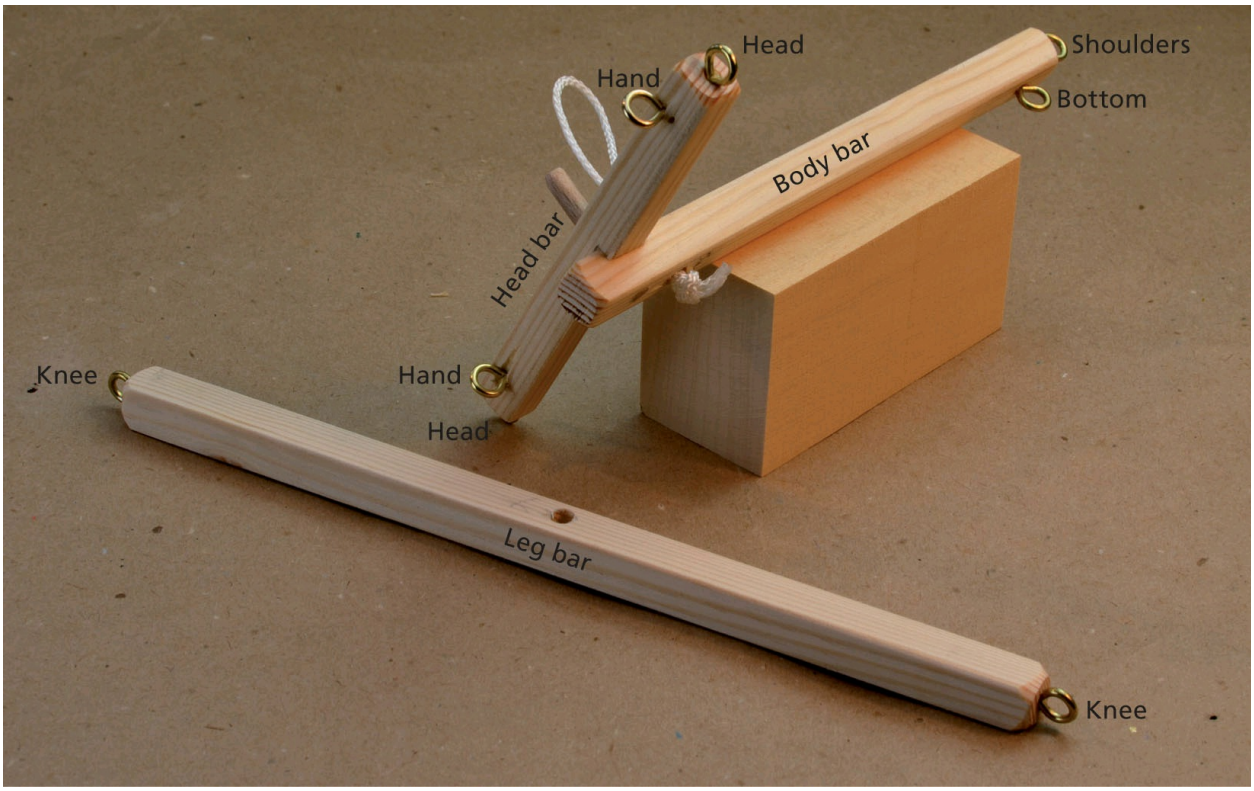
At the centre point of the head-bar, mark the thickness of the wood (about 14mm) so it can be notched to fit onto the body-bar. Saw a small section out, about 4mm deep.

Slot head-bar on top of body-bar 1cm from an end. Drill a 5mm hole through both bars, while they are slotted together, to take a wooden dowel. Drill a 5.5mm hole through the centre of the leg-bar.

Sand all the bars smooth, rounding the edges to make the control comfortable to hold. Glue body and head bars together with PVA. Glue and hammer 45mm of 5mm hardwood dowel into the holes to fix the two bars together, leaving around 15mm sticking up as shown, and sand the end round.

When dry, drill a 4mm hole through the body-bar just behind the head-bar to take a cord loop. Tie a 2mm cord loop on, in the same way as the loop for the Walking Bird.

Bradawl and screw in eight small screw-eyes as shown.



The finished control.

Stringing

Decide how far below the control you want the puppet to perform. I have put the puppet on very short strings; this is ideal for walking the puppet on a chair or on a table. Longer strings could be used if you want the puppet to perform on the floor. With short strings, the puppet is easier to control. I will describe the string length I have used.

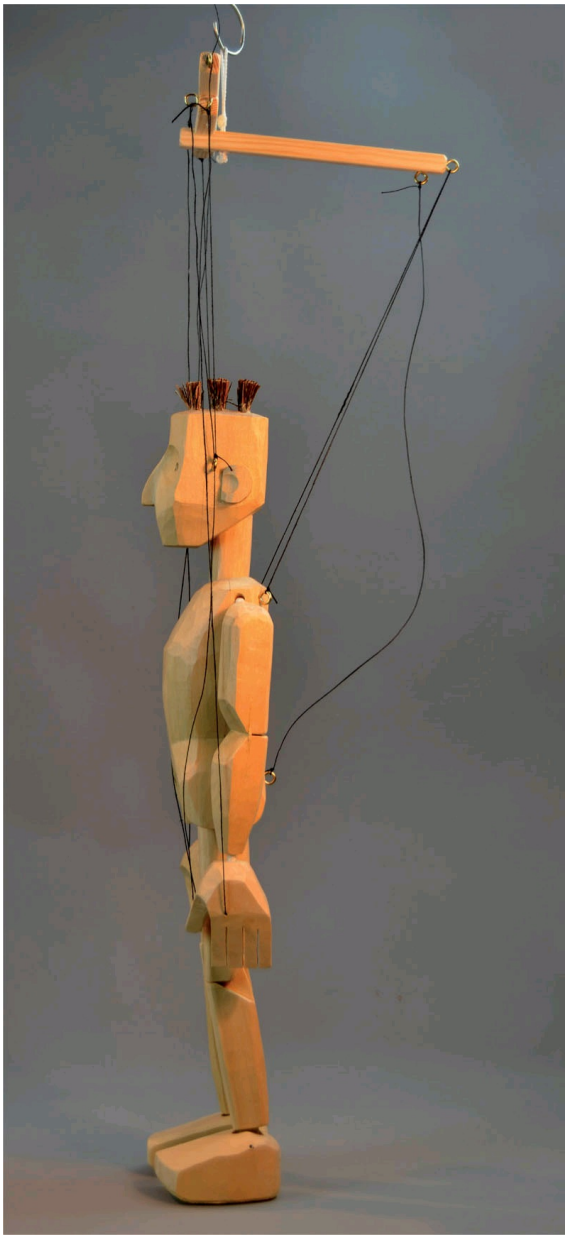
Bradawl and screw in small screw-eyes at the following points: two in the head, near temples; two at back of shoulders, high up and wide; one on bottom; one just above each knee-joint. Angle the bradawl holes at the knees upward away from the joint, so the screw-eye does not go near the joint. I have made the knee screw-eyes a bit smaller, to make them less conspicuous; I used pliers to cut a quarter of the eye away, then squeezed the eye closed.

Drill 1.5mm holes through the hands near the index finger knuckle.

Attach 35cm length of linen thread to each head screw-eye with a full knot. Run these threads up to the control, tying one with a full knot, and the other with a half knot (a half-hitch), so the head is about 20cm below the

control. Hang the control from its cord loop. Adjust the half-tied thread's length until the puppet's head is absolutely level seen from the front. Now tie another half-hitch to fix the knot.

The finished puppet strung onto its control.



Tie 90cm of thread to one of the puppet's shoulder screw-eyes with a full knot, run it up to the control screw-eye and down to the other shoulder. Tie this with a full knot, so the shoulder-end of the body-bar is pulled slightly down and the shoulder strings are tight.

Tie 50cm of thread from bottom to control, looping it outside the shoulder strings, keeping it loose. Tie full knots.

Tie 70cm of thread to each knee with a full knot, run up to control and tie off to the leg bar. Tie off with full knots, so both leg strings are exactly the same length, and are a little slack so the leg bar can be lifted off its peg without lifting the knees. Remove the leg bar and let it hang down on its

strings, out of the way.

Cut 1.4m of thread for the hands. Tie a double knot near one end, to form a large blob that is too big to be pulled through the holes in the hands. Thread through palm, up to the control hand screw-eye, through the last screw-eye and down to the other hand, tying another blob-knot in the palm, so the string is just tight without lifting the hands.

Trim thread ends to be 1cm long at the puppet, and 2cm at the control.

All done!

Bring the puppet alive

This puppet is the most challenging of the three puppets to bring alive.

Hold the control in one hand, and lower the puppet until his feet are resting lightly on the floor. Increase tension in the shoulder strings by tilting the control down; this will make the head look down, and then if you twist the control the puppet will look left or right. With your other hand, reach in and pick up the hand string. This is a run-through string so you can raise both arms or just one. Putting tension on the string to the bottom, and lowering the whole puppet forward and down will make the puppet bow. Un-hook the leg bar, and use it in a see-saw action to lift and lower the legs, to make him walk. You can use the leg-bar and at the same time tension the hand string to raise the arms while he is walking.

Place a block for him to step on, sit on and jump off.

How to hold the control for walking the puppet with raised arms.

Clear, slow gestures are better than just jiggling the puppet.

The best way to progress is play. Try him with sounds and words. Like all puppets, your Wooden Man is best when he is doing some meaningful action: walking, hopping, sleeping, being sad or happy. Try out true-to-life movements, and then explore what moves he can make that no human can do, like levitating!

To prevent tangling, keep the puppet hanging up when he is not performing.

This is a puppet for adults to perform. He is heavy compared to the

other two puppets, and without good coordination, the puppet's movements cannot be fully utilized. Treat this puppet like a delicate musical instrument.

When you have worked out some good moves, both adults and children will be enthralled.

A block is useful to sit on, step on and jump off.

Where the puppet's eyes look is very important and can be given meaning. Has he lost a contact lens?

CHAPTER SEVEN

ONWARD

I hope you have enjoyed making the puppets described in the three projects, and are having fun performing them for family and friends.

The Wooden Man looking to the future.

Make more

If you are inspired to make more you should now have a good overview of some techniques, so you can design and bring your own creations to life.

Perform more

If you want to take performing with puppets further, try devising a short piece. Add words and music, and rehearse in front of someone who can be your director and outside eye. Try videoing the result to see what it looks like. Use a plain-coloured background and a few simple household lights to make your puppets stand out.

When you are ready … invite an audience.

Find out more

Try to see as many puppet shows as possible.

Britain currently has five building-based puppet theatres:

- The Little Angel Theatre, London
- Norwich Puppet Theatre
- Upfront Puppet Theatre, Cumbria
- Harlequin, Wales
- Biggar Puppet Theatre, Scotland

There is also:

- The Puppet Theatre Barge, that floats in and around London.
- The Little Fawn Caravan Theatre, based in Glasgow, travelling around the whole of the UK.
- The Scottish Mask and Puppet Centre in Glasgow which has a small performance space.

There are numerous touring puppet companies in Britain taking shows to streets, village halls, schools and theatres. Keep an eye out for puppet festivals both internationally and in your own country. Many theatres use puppetry regularly, either as a puppet show or within a play with humans.

You can find puppets in museums and housed by other groups.

There are at least ten puppetry organizations in Britain, catering for the interests of amateurs and professionals.

UNIMA (Union Internationale de la Marionnette) is an international puppetry organization, with national centres throughout the world. UNIMA is a good place to start finding out about what puppetry there is

in your country.

Books

There are books on most aspects of puppetry from making to performing. Some excellent books are no longer in print, so borrow from libraries, buy used copies from second-hand book sellers, or look on the internet.

Workshops and courses

Going on a well-run workshop or course can be inspirational. You will learn new skills and make connections with people who are interested in puppets.

There are apprenticeships and degrees in puppetry.

Supplies

Hunting for the right materials or tools can be like a treasure hunt – you might not find what you were looking for, but if you keep an open mind you might find excellent alternatives.

Ask your local shops to help you find what you need. The internet has become a gamechanger when looking for materials and equipment.

Endless possibilities

Whether you keep puppetry as a hobby or make it a profession, the possibilities are endless. I never thought when I did my first puppet show for my family on our dining room table, about sixty years ago, that I would end up as a professional puppeteer, making, teaching and performing around the world.

PUPPET AND PHOTOGRAPH CREDITS

All puppets, photographs and drawings are by John Roberts and PuppetCraft unless credited here or in the text.

INTRODUCTION

Use of photograph courtesy of Lyndie Wright.

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Some of these finger puppets are by www.littlefingy.com

Designed by Joanna White for PuppetCraft.

Mr Punch made by Michael and Georgina Spurgeon.

The Thang Long Water Puppet Theatre. Photograph by Loan Rathgeber.

Baba Yaga performed by Rachel Miller and PuppetCraft.

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Drawing contributed by Geppetto's Workshop, www.geppettosworkshop.com.au

Use of photograph courtesy of Lyndie Wright. Production designed and directed by Christopher Leith.

Puppet from The Miles Lee Collection. Photograph by Nicky Graziano.

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Puppet designed and sculpted by Kamela Portuges. Fabrication by Images in Motion team and Luman Coad. Photograph by Lee Armstrong – Images In Motion.

Puppet by Lyndie Wright. Photograph: Steve Tanner/Kneehigh.

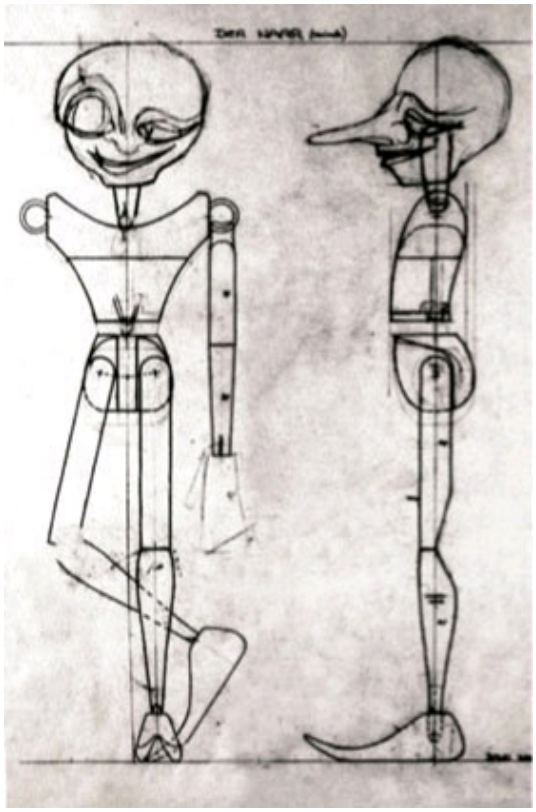
CHAPTER ONE

Photograph by Andy Bilewycz.

Photograph courtesy of The National Puppetry Archive.

A puppet from the stage production of *Nice Fish* by Mark Rylance and Louis Jenkins, directed by Claire van Kampen, and produced by Sonia Friedman Productions at Harold Pinter Theatre, London, in 2016. Puppet designed by Lyndie Wright, made by Jan Zalud and John Roberts, costumed by Keith Frederick and hair by Katrin Kratz. Photograph by Jan Zalud.

Photograph courtesy of Peter Fluck. Photograph by John Lawrence-Jones.



Puppet design by Düsseldorfer Marionetten-Theater.

Photograph by Mathias Michel.

Photograph by Serge Koutchinsky – Royal de Luxe.

Puppet by Jane Eve. Photograph by Mark Eve.

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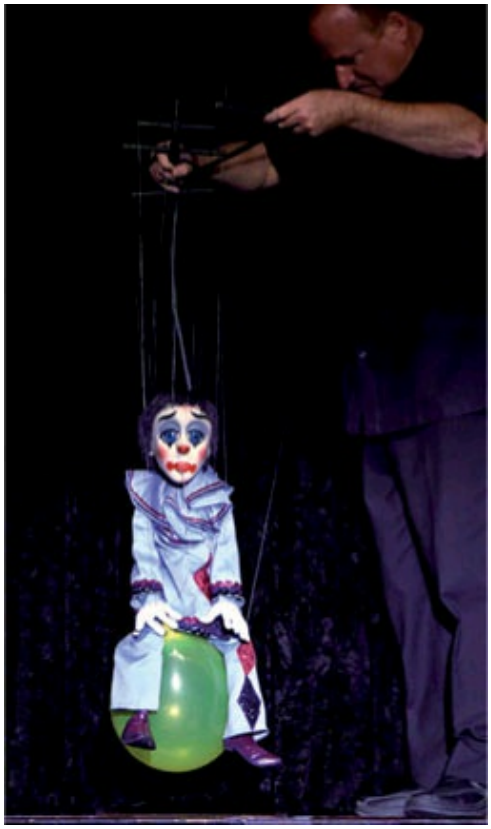

Photograph courtesy of Scott Land.

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Photographs by Swati Sharples.

Puppet by Michael Tann.

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CHAPTER TWO

Made by Sue Field.

Made by Sue Field.

Made by Laura Courtenay.

CHAPTER FOUR

Puppet components and photograph by www.BYOPuppet.com

Puppet by Mandi Allin.

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