Puppet making Materials list and advice – Developing collaborative Practice Level 2 module.

"There is no one set way to make a puppet. I have seen the most beautiful of puppets made with the most surprising materials (tissue paper, new paper, found objects, etc.")

Barry Purves – Award winning animator and director.

- Your tutor has booked in a series of skills based training sessions over the next three weeks. The workshops planned for you in this time are designed to introduce you to key practical and technical issues in puppet fabrication,(such as repair and replacement technology,) and to familiarise you with a range of commonly used materials and technical fabrication processes.

- They do not aim to dictate to you the approach that you may take, but simply to introduce you quickly and effectively to *one* fabrication pipeline and a range of resources and materials at your disposal. It is your job to experiment, innovate and explore these techniques outside of the taught sessions, and produce puppets to your own design specification that will perform well and fit the style and narrative conventions of the film.

- I will make time towards the end of these sessions to discuss your designs and ideas, but my main objective initially is to deliver the training exercises and introductory sessions as comprehensively and quickly as possible.

- Each session will run from 10 until 5, and I expect every student who attends on day one to attend each session. Puppet making is a resource and time hungry activity, and you will not be able to dip in and out of the training. These six days are the only skills based fabrication workshops in place on the entire degree, and as such, there is a phenomenal amount of ground to cover. Students who consistently arrive late or participants who have missed a morning or day session and the vital training delivered during that session will lag behind very quickly, and impact severely on the instructor's time, and the learning of others in the group. **Essentially, you are in 100 per cent of the time or you do not attend.**

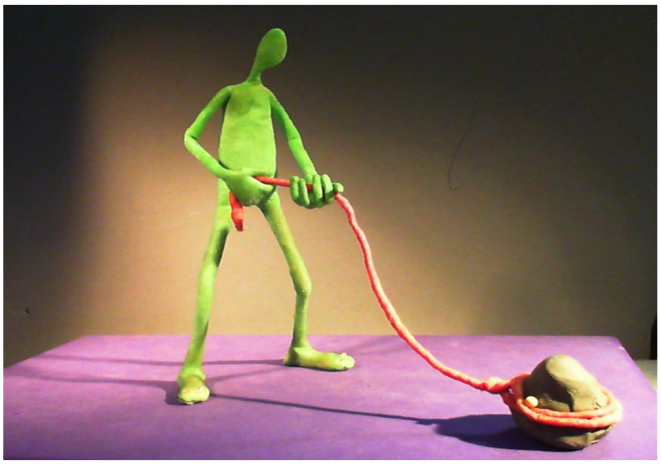
Please note that it is impossible to advise students on amounts/sizes and options until the entire team has formally signed off on the following key decisions.

- The film you are making
- The performance required of the puppet.
- The size, proportion and visual style of the puppet
- Your budget
- Your level of existing skill and natural ability as a designer/puppet maker.

In order for you to begin to make informed decisions you need to establish your working practice and existing skill level (in a puppet making workshop) and you will need to produce considered and confidant design documentation.

Please attend the workshops for more information on "Design Documentation" and for the location of the resources for further information on these essential tools.

Baby's first puppet materials list



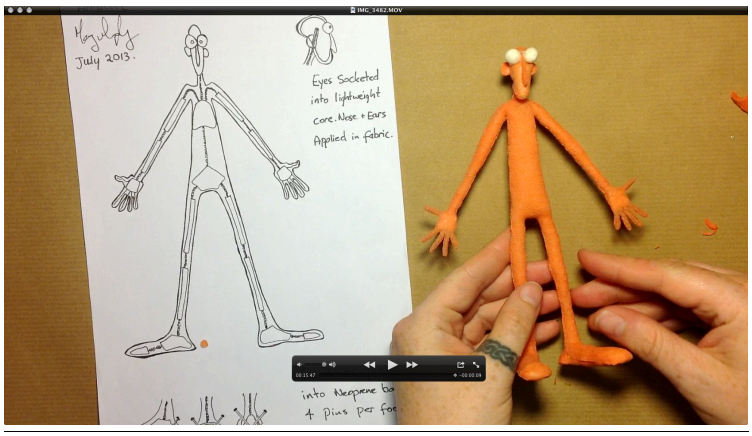
- This little training puppet is small, light, and designed to move easily and freely.

- It is low cost, and requires no specialist tools or knowledge.

- It main aim in life is to train the novice puppet maker in some key materials, processes and approaches.

- It also provides the novice stop motion animator with an instant basic puppet to begin training with, free from the agonies of design and embellishment.

- The initial outlay is Approx £50 if buying stock materials from scratch. The following is a list of the materials and tools that will be provided during the workshop sessions.



Helpful tips for resourcing and procurement - stop motion paradigm

I have gone to some length to source these materials, and to identify the supplier that delivers the materials quickly and cheaply. You are welcome to research and use other sources if you wish, but you need to factor in some key considerations in when using new or untested suppliers:

1) Are you sure that you have sourced the correct material? A photograph on a website can be very deceiving, and some of these materials (for example the foam) need to have very specific properties which are impossible gauge without a sample.

2) The cost of carriage – how much will the delivery cost? Often a student will source a product at a slightly cheaper price, only to discover high shipping costs.

3) Is it in stock? Ring the contact number and check, if something is out of stock the order can be delayed for days or even weeks.

4) Delivery time – sometimes it can take four or five days to be delivered…or even weeks if it is coming from the USA, or Japan and you need to think about the delivery address – if you address it to your own student address and no one is in to receive a package it will go to a depot, and many of these are outside the city centre, and close at 5. You can have items delivered to the University care of a staff member, but ask them first.

Money matters

Work out early in production exactly how your budget will be managed. I would suggest that putting one person in charge is not the most efficient option, as that puts pressure on one individual to both control others spending (very difficult) and to be available at all times to source and purchase. I would suggest that the group initially sits down and makes a list of things that they know they will need and then works out the following:

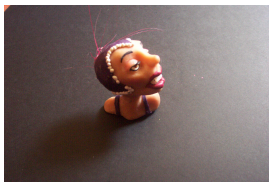
1) What they may have already in terms of tools, materials etc.
2) What common and low cost materials Mary is happy to provide within reason.
3) What specific materials will you need in order to develop your skills and complete
4) Your production?

Polymer clays – used for heads, props and armatures

Super Sculpey

This is a Polymer clay which can be modelled by hand, and baked in a domestic oven. It has many applications, but is mostly used to model up puppet heads and occasionally non flexing hands and fingers. It is sometimes available in the stores, if not, it can be ordered from the website below. It is slightly cheaper than the living doll variety below, and easier to use, but with a slightly more "Plastic" look. It can be painted with water based paints, sanded and drilled. It is sometimes used on armatures in place of polymorph, but it is not ideal, as it is very heavy, quite brittle, expensive and non-recyclable.

454g Super Sculpey Ref: SUSC1LB
Colour: pink-beige
Price: £9.80



At this link

http://www.polymerclaypit.co.uk/acatalog/Super_Sculpey.html

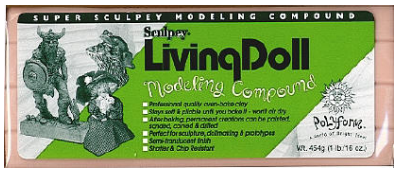
Other colours

Sculpy comes in smaller packets in a range of colours from this site (see the "Premo Sculpy" range) and these colours can be mixed like paints to achieve a more subtle shade. They also do some speciality clays that can be useful, such as metallic or stone effect products.

Living Doll sculpey

This is a slightly more expensive version of Super Sculpy. It has a slightly translucent finish, (Light passes through it) and is more suitable for a more adult or realistic visual style. It comes in three flesh tones, but can be blended with any of the “Primo sculpy” range (small coloured blocks of the same material found on the same site) for a more subtle colour.

454g Sculpey Living Doll - Beige
Ref: SCLD1LBB
Price: £11.25



At this link http://www.polymerclaypit.co.uk/acatalog/Sculpey_Living_Doll.html

Sculpy Ultra Light

This is a very light, somewhat “marshmallow” substance, which can be modelled into rough shapes, and baked in a domestic oven. It is a bit rubbish for sculpting fine detail, but it is an excellent material for reducing weight in a stop motion puppet, especially when used to make a lightweight core for inside a head or torso. You can bake it, and then model over it in living doll or super sculpy. It is also an excellent material for making lightweight eyeballs or teeth in a large head, as it can be moulded easily in a sprig mould, and it takes colour extremely well. It is sometimes used to form a small amount of bulk on the torso or pelvis of an armature, to give the animator a solid spot on the body to hold when animating. It works well when used with fabric or sponge, as it is a slightly porous surface, and takes a range of glues well. It is slightly flexible when baked, and can be carved, trimmed and sanded well.

292g Sculpey UltraLight Ref: SCULTRA
White coloured Sculpey Ultra Light Clay 292g (10.3oz) Brick
Price: £9.00

At this link http://www.polymerclaypit.co.uk/acatalog/Sculpey_Ultra_Light.html

K and S square brass tubing

Used mainly for registration of replacement parts or to allow repair or modification, K and S is a series of square brass tubes that slot perfectly into the next smaller size (Like a radio arial, but square) Once you have identified the size of your puppets neck wire, you fit the appropriate size to the cut end, and build the head around the next biggest size. This approach allows you to remove the head easily. I have prepared a resource called the “Gauge Board” to help you to identify the correct K and S size to fit your choice of wire.

152 5/32nds inch sq brass tube - £1.89

153 3/16ths inch sq brass tubing - £2.09

154 7/32nds inch sq brass tubing - £2.24

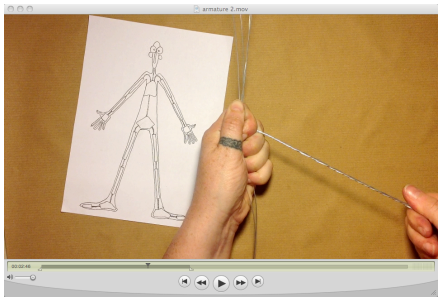
At this site http://www.cheshiremodels.co.uk/acatalog/Square_Brass_Tube.html

Milliput

Milliput is a two part epoxy putty. It comes in a range of colours, but as the white one is easily painted I would recommend that version. It is a soft clay like substance which when mixed will set to a rock hard consistency overnight. It is very strong, and easily sculpted, but quite heavy, so it is not used extensively for large sections of a puppet. It is used to create a solid platform for glue or further application of a material, for pin down feet, and for hard organic structures such as teeth or horns. It is sold in most art supply shops (including the UWE stores) and online on Amazon for £5.58.

http://www.amazon.co.uk/Milliput-Superfine-White-Stick-G-MP803/dp/B004RO1XQU/ref=sr_1_6?ie=UTF8&qid=1381845962&sr=8-6&keywords=milliput

Aluminium armature wire.



This is used to form the flexible joints of your puppet (such as the spine, elbows, knees etc.) as well as any free flowing components, (Hair, tails, feathers, trailing elements of costume etc.) The wire is strongest when twisted together in two, three or four strands to form the arms, legs and spine of your puppet. The first workshop training you will receive aims to simplify this, using one gauge for the entire puppet, but as your designs become more complex, you may be using up to three different gauges on one character. There are three important things to consider when buying wire:

How thick should the wire be? If the wire is too thin, it will not support the weight of the puppets head and limbs, and it will sag and flop around on set, especially around the lower legs, where there is most weight on the armature. The resulting animation will lack control, and will not look believable. If the wire is too thick, it will be very difficult to manipulate the puppet, and the movement will be stiff and jerky.

What is the best type of wire to use? If you use a wire that is too springy, such as steel wire, your puppet will also be very springy, and will tend to twang about every time you touch it. The best wire to use is annealed aluminium wire, as it holds its shape when bent. This type of wire is quite soft, and therefore easy to bend. See below for suppliers and gauges.

How do I stop my wire from breaking? Well, the bad news is that you cannot prevent your wire from snapping eventually. All wire will break if it is constantly bent at the same point, and the typically weak points on a wire armature are the ankles wrists and neck. You can extend the life of your armature by twisting several strands of wire together, and by handling your armature as gently as possible at all times. With care, an armature fit for purpose can be used to shoot about a minutes worth of animation, more if you make the hands replaceable. As you develop your skills, you can begin to design and build armatures that can be easily repaired, or begin to investigate ball and socket technology, but for the beginner with a tight deadline it is easier to simply build three or four identical wire puppets from the outset, and to always have an understudy waiting in the wings.

It is very important that you use soft aluminium wire, and that you have a range of sizes available to you. The wire that I would recommend is pictured below, and comes from a company called “Rowan Cable”

It is available the site below in a range of sizes, starting with 0.71mm (For fingers, hair etc) and goes up to 1.22 (for heavy puppets) The remaining larger sizes are very difficult to animate with. I can supply you initially with these sizes, but in limited quantities.

Soft Plain Aluminium Wire BS2873 GIB.0

.91mm At £948 for 20 m 1.22mm At £12.93 for 20 m

http://www.rowancable.co.uk/page5.htm

The strands are then twisted together to form limbs. The thickness of the wire and the number of strands that you twist depend on the size, weight and function of the puppet in question, and the question is best answered by developing a range of prototypes and Marquette’s early in production.

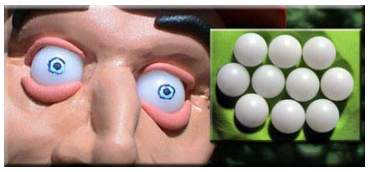
Working with wire requires a range of pliers and wire cutters. These will be available for your use in the puppet making room, but I would ask that you do not take them home. It is in your best interest to invest in a small range of wire working tools, especially if you are interested in further developing your fabrication skills in semester 2. I would recommend that you buy each of the types pictured below, and if you can afford it, buy the spring-loaded type where possible. (Draper is a good brand)

Beads for eyes

You can make custom sized eyes from sculpy ultralight, polymorph or milliput, but sometimes a glass bead is needed (especially when you are baking sculpy components in a hot oven or using casting techniques, and need a uniform size to fit into a mould) If you want to order them cheaply and in bulk, you can do so at this site

http://shop.beadworks.co.uk/listItems.asp?displayType=Across&Cat=PRESSED_FP&Search=Link

These are not quite round, as they are made in a two part mould . If you wish the eyes to articulate (although this is less effective than you think, and I would advise against it where possible) you will need a more expensive product. Delrin is the brand name of a very high density plastic that can be heated to 300 degrees. It is used in industry where ball bearings are required in a magnetic environment. (Medical equipment, imaging technologies etc.) A delrin ball bearing is perfectly round, can be baked inside a sculpy socket, and can be drilled to take a fine pin for manipulation. It is also a very receptive surface for permanent marker, so eye details such as pupils, iris etc. and be easily drawn on. Delrin comes in a range of sizes, but it is a more expensive material than the glass beads above. It is best suited to a very “real” or unstylised design approach. They are available from a range of suppliers, in a range of sizes.



http://www.gmsball.co.uk/index1.php?wd=1259&ht=925

Speciality eyes - You can source hand blown glass eyes, or acrylic doll eyes if you wish, but be aware that these are often in a limited range of sizes and not articulable due to their shape. They are also quite expensive, and can look very doll like and out of place if your general fabrication/design work is weak or over simplified.

Foam/Sponge

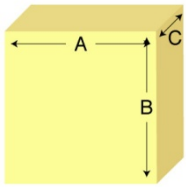
Foam has a variety of uses for the stop motion puppet maker. Glued to the armature and trimmed/carved with nail scissors it can be used to create lightweight form which will allow some degree of flexibility. Thin sheets dipped into latex can be used for fine details of costume, as well as a very effective skinning material. There are hundreds of different types of foam out there, from household sponges to fine memory foam, and each one has potentially some application at some point. The key to sourcing foam is to know exactly what process and part of the puppet you are applying it to.

Upholstery foam Block

For trimming/sculpting bulk, you want something cheap that comes in blocks (At least as big as your puppet) and that is fairly soft and flexible. A foam that glues well is key, so test a sample with a glue gun in order to assess how well it adhered to a small scrap of polymorph or a spare twist of wire. Remember, testing on a full armature is not very time or cost effective.

Block foam can be used to carve out bulk in torsos, or very sculptural limbs and hands. It is glued to the armature, then trimmed back to reflect the design details of the model sheet and scale drawing. I find it best to simply visit fabric and foam shops, and see what kinds of foam you can find, but if your budget extends to it, the memory foam sheets on this site work very well, and can be ordered in ½ centimetre sheets. I would usually spray glue another product, such as muller wrap (see below) to this if I was simulating skin or hide.

1 X 200x200x5 cm piece of foam



General Foam (Firm) - A firmer harder wearing form suitable for commerical seating and funiture. Use this if you want to firmer mattresses, cushions etc.

Total for 1 Piece(s): £32.29

At this site.

http://www.twfoam.co.uk/priceOptions.php

Muller Wrap

£1.74 per roll.

This is very thin foam used to reduce friction under support bandages. It is sold in rolls, and is extremely cheap. When dipped in flesh coloured latex and applied to an armature it can make a very effective skinning material. It can also be applied dry in some applications, using a spray glue to hold it in place. It has a huge range of applications and treatments (try creating detail and texture on top of it using coloured latex) and is very cheap to buy. It comes in a range of bright colours from Amazon, as well as a flesh and buff colour for more realistic designs.

http://www.amazon.co.uk/Mueller-M-Wrap-Underwrap--Natural/dp/B001DJ9Z4Y/ref=sr_1_1?ie=UTF8&qid=1381842790&sr=8-1&keywords=mueller+wrap

3mm to 5mm fine cell foam scrim.

This is the holy grail of foam for puppet makers. It is a very soft fine foam sheet used in making car seats. It is used in puppet fabrication most commonly in skinning hands and heads, as it takes latex exceptionally well, and adheres well to itself and a range of other materials.

It is difficult to source, so when buying, it is well worth investing in a large stock supply.I have a large supply of white 3mm scrim in my office, so you will not need to order this, but FYI the supplier is Cotswold Foam LTD and their telephone number is 10452 521364

Memory foam

This foam has a high latex content, and a fine cell structure, and works well with latex. It does however absorb a considerable amount, making it heavy compared to more open, cheaper foams. It does have applications, and is nice to work with where weight is not a vital consideration. It is available from a wide range of suppliers, including the “Twofoam” link above, but it is expensive.

Polymorph

Polymorph is a low melt plastic material that is used to make the “bones” on the armature. When rolled to a thin sheet using a pasta roller, it can be easily trimmed with a scissors to form template “bones” or rigid sections which can be then melted in hot water, and wrapped around the wire. It can also be used to make head armatures and feet. It is sold in large tubs (Pictured below) for £19.95 or smaller sized containers at £9.99 each. It is available from Maplin and Amazon and it is sometimes available from the UWE Stores. (Ask at the desk)

Available here

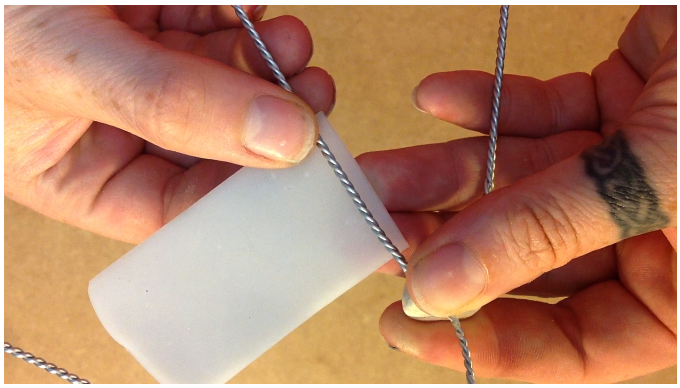
http://www.amazon.co.uk/PROTOTYPE-MODEL-MAKING-POLYMORPH-THERMOPLASTIC/dp/B009LJG7XK/ref=sr_1_5?ie=UTF8&qid=1381845436&sr=8-5&keywords=polymorph

or here

http://www.maplin.co.uk/polymorph-35511

Large tub £19.99 approx

Small tub £11.99 approx



Glue and adhesive

As a puppet maker, you will need to familiarise yourself with a range of products and their applications. Wood glue or PVA is essential for set and prop making, but it also can be used as a medium for paint effects, and as a stiffener on fibre, fabric and foam. It is sold in most DIY and art shops, as well as from the UWE stores.

Glue gun

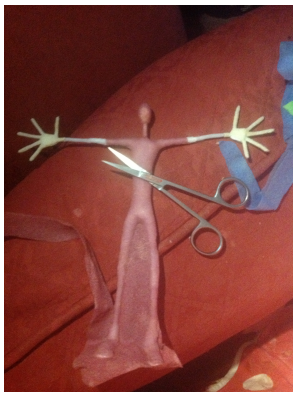
As glue gun glue is quite flexible when set it is an absolute must for the puppet maker. It is used in a range of applications, including securing foam blocks to a wire and polymorph armature prior to trimming. It can be used to attach K and S, rendering it reusable, and also as a filler material on shoes and small props. When it comes to securing items on a set it is key, as it is fast, quick setting, and can be picked off easily. I find the mini glue guns very useful, as they are more delicate and easier to control.

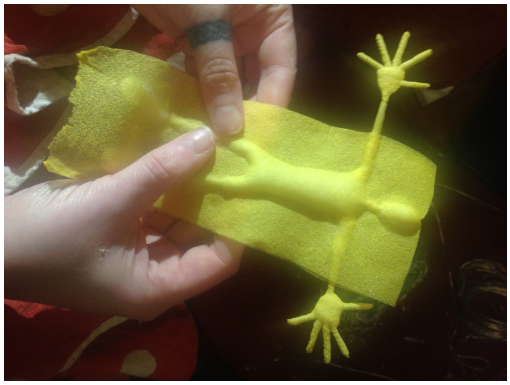
Araldite

This is a two part epoxy resin. Epoxy resin is a type of adhesive which is activated by mixing equal parts of two separate components. There are many brands of epoxy resin on the market, but I have found the quick setting Araldite brand pictured above to be the best option for puppet fabrication. A small stock of toothpicks and cardboard squares on hand makes mixing it up and disposing of extra material easy, and I would always have baby wipes on hand when using it to keep hands and tools free of drips and residue.

Latex

A key material for fabric based puppets; it is used to create a flexible flesh like skin if needed. Mixed with flesh coloured water based paint, it is a good colour match for baked sculpey, and applications can be simple and cartoon like, or more sophisticated and realistic depending on the skill and ambition of the maker, and the design aesthetic of the film/sequence. Liquid latex is available from most art supply shops, but I have found that the dipping latex sold in the UWE stores for £6.00 is ideal for puppet making, and very reasonably priced. Used in combination with the scrim foam and muller wrap it can have a huge range of applications, from faces, hair and clothing to fingers, feet and limbs.





Copydex

Copydex is essentially thickened latex, and can be useful where the dipping latex is a little too thin for purpose – usually when gluing thin fabric, as it is less likely to drip or soak through to the front of the costume. It is available in the UWE stores, or from most office supplies stores and art shops.

Other items you will need to source –

Screws and nuts (3mm machine screws in varying lengths depending on the thickness of your set and the size of your puppet.

Needles, pins and sewing thread.

A range of scissors, from very small pointed nail scissors for trimming foam scrim to cheap craft scissors for cutting polymorph sheets.

Cotton buds – Useful in conjunction with polymorph sheets for attaching hands to small puppets, but also for applying paint, distressing sets, or cleaning and wiping small parts on set.

Baby wipes – Essential for keeping your hands and general area clean, key when finishing a puppet to avoid transferring glue to costume or skin…far more effective than a cloth for managing drips and spills. Also useful when sculpting or finishing clay to smooth surface detail.

Paint brushes – for set building, applying latex etc.

Hollow fibre stuffing/quilt batting/wadding – for adding shape and detail.

Cocktail sticks – essential for mixing glue, sculpting clay etc.

Findings – small buttons, bits of jewellery, beads etc. that work as scaled down detail on costume or set.

Wool - From thick brightly coloured to lace weight mohairs in neutral colours. Can be used as hair or fur, or to simulate rope or twine. Felting wool is also effective in creating a “real” texture if needed.

Super glue

A very quick fix on set to manage loose fabric or to hold a snapped puppet together until the end of the scene.

You will also need to source and test a range of materials that are specific to your production, (fabric, real world textures, key props and set pieces specific to your narrative and character)

Getting to know your puppet from the inside out.

Before you can create a stop motion sequence, you must firstly build a stop motion puppet.

The term stop motion refers to an animated sequence where the characters have been designed and built as freestanding three-dimensional objects. Stop motion puppets can be made in a variety of ways, and from a huge range of materials, ranging from simple plasticine blobs to very complex silicone and metal characters used for stop motion TV programs and films.

What you will need.

Making a stop motion puppet involves using a wide range of materials and processes. Firstly, you must prepare your puppet maker's tool box, containing the range of tools and materials you will need to in order to make the stop motion puppet.

Storage and transport of materials

Stop motion is a space hungry pursuit. It requires a lot of forward planning, negotiation and consideration in terms of location and storage of tools, materials and equipment.

Be aware that constant relocating the fabrication process will require exhaustive lists of the tools and materials that need to be moved. I have seen students lose an entire day on production due to a team taking bring a bag of key materials and tools home, and then not turning up at college until 2 in the afternoon.

Make a decision as a team to sign on-going work in and out, with a list of tools, and a negotiated time for their return. Better yet, make a decision to work in the studios, taking advantage of the late access policy.

The puppet pictured here is made in three stages.

- Firstly, we begin by building an armature from wire. An armature is essentially a flexible skeleton-like structure that will be rigid enough to support the finished puppet, but flexible enough to allow it to move and bend. This armature is made from aluminium armature wire, and a substance called “Friendly Plastic” or “Polymorph”. The feet are part of the armature, but each one contains a nut and a screw which form a structure called a “tie-down”. These tie-downs are vital when it comes to animating the character, as they allow the puppet to be attached to the set, which stops him from constantly falling over.

- On top of the wire is the “core” of the puppet, in this case a layer of sponge or foam, which provides the shape of the body, and which is light and flexible. This is then simply covered with fabric, which is stitched or glued in place.

- The head is made from a substance called “Sculpy” (essentially a polymer clay, which you form when soft, then bake in an oven to harden) The eyes are white glass beads, with a dot of paint or ink in the centre. The hair is simply black wool, stiffened with wood glue. The hands can be made with wire and foam, or they can be sculpted up from plasticine or unbaked sculpy.

Friendly Plastic/Polymorph.

This wonderful substance comes in the form of either plastic strips, or small white grains. It becomes soft and pliable when dropped into very hot water, and it remains soft for two to three minutes. As it cools, it then hardens again to form a very strong lightweight material. It is ideal for the first time puppet maker as it is easy to use, lightweight and most importantly re-usable. If you get it wrong the first time, simply dunk the part you are working on back into hot water, re-melt the plastic and try again. . You will need a cup or mug and an electric kettle when working with Polymorph.

BANI_SHOOT_2-3.tif

Friendly plastic strip. It comes in a range of colours.

BANI_SHOOT_2-4.tif

Polymorph grains. Polymorph is white in colour.

BANI_SHOOT_2-29.tif

Beads for eyes…

Of course the easiest way to make eyes is to simply make two holes in the clay, using a modelling tool or a pencil, but glass beads give a puppet a nice cartoonish expression. When you become skilled at making heads, you will learn how to set the beads into the head in just the right way to allow them to be moved with a pin while animating. The beads must be made of glass, as plastic ones will melt in the oven when you bake the head. The best eyes are made from “Pressed” glass beads, which are cheap, have a hole through them, and come in a range of sizes.


BANI_SHOOT_2-5.tif

Pressed glass beads – different sizes from 6mm to 10mm wide.

Sponge or foam.

The ideal foam is white, dense, and very soft. It is used for making seat cushions, and comes in sheets, about 1.5cm thick. Another really useful source of very thin foam is the backing from an ironing board cover.

However, really any type of foam can be used here, from bath sponges to upholstery foam. Thin sheets of foam are the easiest to work with, but you can simply slice thin strips from a larger block with a craft knife or scissors.


BANI_SHOOT_2-113.tif

Sweaters from socks…

The best type of fabric for making a stop motion puppet is any fairly fine material with two way stretch (Manmade fabrics such as nylon are ideal) Keep a rag bag of any old socks, T shirts and tights you no longer want to wear, the more brightly coloured the better, and rummage around in fabric shops for remnants.


BANI_SHOOT_2-114.tif

Brightly coloured socks are ideal for puppet-making.


BANI_SHOOT_2-147.tif


BANI_SHOOT_2-146.tif

Material with two way stretch, this type of material is very forgiving when you are learning to sew.

1) Needles, pins and thread.

Good sewing skills are an essential requirement if you wish to make successful stop motion puppets. You will need sewing thread in a variety of colours, darning needles, black wool/yarn and some pins.


BANI_SHOOT_2-112.tif


BANI_SHOOT_2-111.tif


BANI_SHOOT_2-223.tif

2) Scissors, small wire cutters and pliers.

Armature building is a fiddly business, requiring much twisting cutting and bending of wire. A range of pliers will save your fingers, and make the job easier. A sharp pair of scissors with a pointed end is a must have.

BANI_SHOOT_2-1.tif

3) **One type of glue simply won't do…**

When making a stop motion puppet, you will need to have some different types of glue at the ready. A hot melt glue gun is essential when making tie-downs. Hair can be stiffened and stuck to a polymer clay head with wood glue, and a latex based glue (such as copydex) is essential when making the foam based core of the puppet. It is also a good idea to invest in a tube of epoxy glue such as araldite.

BANI_SHOOT_2-120.tif

wood glue

BANI_SHOOT_2-121.tif

copydex

BANI_SHOOT_2-122.tif

Arraldite

BANI_SHOOT_2-7.tif

Hot melt glue gun with glue sticks.

4) Nuts, bolts, wing nuts and screws.

These are essential if you want to make tie-downs. I always buy them in bulk, and make several sets of tie-downs per puppet.

Useful Websites.

As you become more experienced and ambitious, you may wish to start experimenting with more advanced materials, such as latex and silicone casting. This list contains materials and suppliers that may be of use to you in the future.

http://www.mwanke.com/

Plastic doll spine, glass eyes, eyelash strips etc.

http://www.polymerclaypit.co.uk/

The best material to try out here is living doll sculpy. Its flesh coloured semi translucent clay that hardens when baked. It can be press moulded, drilled, sanded and carved after baking, and can be tinted with any colour from the premo sculpy range.

http://www.hobbycraft.co.uk/

A huge warehouse full of goodies. A good place to buy beads, paints etc.

http://www.anticsonline.co.uk/

Situated behind the Galleries shopping centre in Bristol. See the page on tools and equipment.

http://www.flints.co.uk/acatalog/shop.html

Supplier of aluminium armature wire and general sculptural materials.

http://www.maplin.co.uk/

Tools, Polymorph, Lights, etc.

http://www.stopmotionanimation.com/

A really good site for tips on all aspects of animation production. Check out Noobie corner.

http://www.awn.com/interstitialAd.php

The online international animation magazine.

http://www.beadworks.co.uk/Catalog/Catalog.aspx?sid=34

Pressed Glass beads for eyes.

http://www.applegate.co.uk/construction/company/co_1206093.htm

A link to contact info for South Western Industrial Plasters. Suppliers of plaster and silicone.

http://www.bentleychemicals.co.uk/

Foam latex mix – foam flex it series.

http://www.physioroom.com/product/Mueller_M_Wrap_Foam_Underwrap/2039/36017.html

Very thin foam wrap (sold in rolls)

http://www.twfoam.co.uk/index.php

Memory foam sheets, cut to size.