The Primary Shakespeare Company

Making an Articulated Scale Model

This is a tricky but rewarding project. It is challenging both to teach and for the children to succeed. Consequently it would be a good idea for the teacher to make their own model first to really get to grips with the processes and materials. It has been conceived of as an articulated model so that once finished the models can be used to create photo-stories of scenes from the play, or if you are feeling ambitious to create stop-motion animation. The articulation makes the models more difficult, so it could easily be adapted to create solid, immovable sculptures. In this plan the creation of hair and clothing for the models is not covered, but instruction for these activities can easily be found in reference books or on-line

Materials needed.

Paper for sketching and jotting.
Wire (thick enough to be robust, but not so thick that the children can't work with it. Thicker wire makes for more stable and robust models).
Pliers
Tin Foil
Papier-mâché
Muslin strips
Mod-Roc strips
Masking Tape
Fabric off-cuts
Scale drawing of stick figure

The process should take at least four afternoon sessions of an hour and a half to two hours. It can be done over consecutive days since the drying time is short and everything can dry overnight. This leaves time for glue, paint and papier-mâché to dry between sessions. You could do it in four sessions, but it would be wise to give yourself one or two extra.

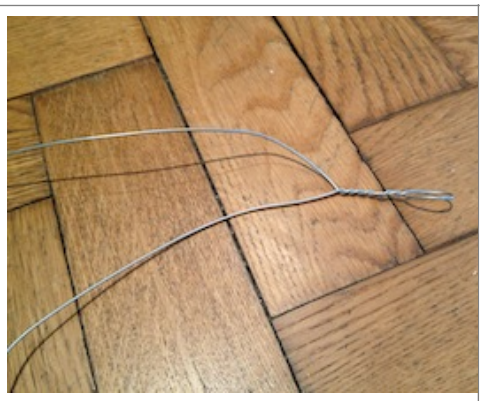
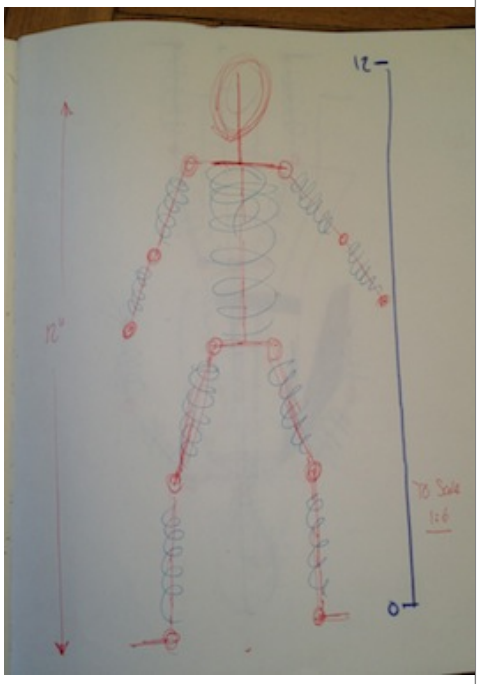
If you have the luxury of another adult in the classroom with you it is not a bad idea to split the tasks into groups – so that one group is making the heads (from week 3) while the rest of the class work on the body (week 1). Similarly if you were going to clothe the figures it would be worth getting a group working on the clothes at an earlier stage. The main reason for this is that the children will end up helping and teaching their peers with bits that they have already done – there can be a good division of being helped and helping in return. It allows what is perhaps the best learning outcome from this topic, which is the experimentation with materials and reviewing the outcomes. Children who help their peers will often point out the mistakes they made and use these to help their peers make improvements to their models. At the end of the project some time spent on reviewing materials and techniques is valuable.

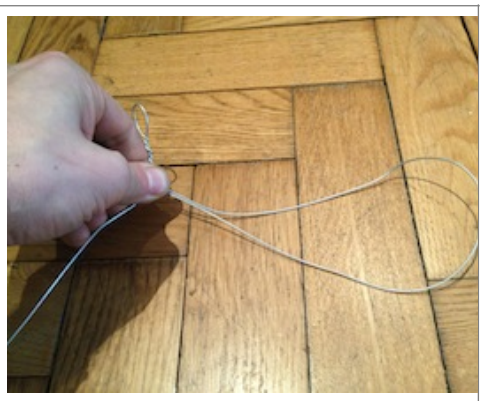
Finally, there is no right way to tackle this project and with more money spent on materials you might well end up with a far superior outcome. As a teacher I think there is much more to be gained from experimenting, adapting, modifying and

generally mucking about with the process as from following the instructions below, Consequently, treat the following as a rough guide…

Week 1.

Making the wire armature, creating tin foil arms and legs, covering with mod-roc.

If each child is going to make its own model you will need a piece of wire about 2 meters long for each child. Halve the wire, and with the pliers create a long neck by twisting the wire tightly together with your fingers while holding the point where the neck will join the body tightly with the pliers.	
Give each child its wire piece with the neck twisted already. The next thing the children are going to have to do is create their scale model of the figure. At this stage it is worth mentioning that it IS BETTER THAT THE ARMS AND LEGS ARE TOO LONG RATHER THAN TOO SHORT(!). Give each child a copy of the scale drawing. (You can reduce them slightly to get a variation in size between men and women. If you are going to make children you'll need to work out the ratio of head:body:legs for children, since it is different). Traditionally the ratio of a human is 1:2.5:3.5 head:body:legs, but to make life easier I use 1:2:3. The scale I use is 1 to 6, so a six foot man will be a model 1 foot tall. That means the head will be 2", body 4" and legs 6" – which are nice and easy to work with.	

With their scale drawing the children are going to make the figure in this order: Arms Body Legs. The neck has two pieces of wire coming from it. Take one and work out the length of the arms (including the shoulders). Fold the wire back on itself and then touch the wire back to the neck. You should have a loop of wire that runs from the neck to the end of the hand and back again. Hold the wire tightly at the neck and start twisting the loop from the hands until you have a tightly twisted arm ending in a looped hand. Repeat for the other arm. Twist the wires together to make the body. Make the legs in the same ways as the arms. Twist any excess wire back around the body or cut it off.	 
Bend the figure so that it has shoulders, hips and knees and elbows. The children might want to measure these things using their scale model diagram. The figures should look like this!	

Now you need to define the limbs and give them some bulk. Fold squares of tinfoil into strips that are the same width as the forearms, upper arms, thighs and ankles. Wrap the tinfoil strips around each section. BETTER THAT THE LIMBS ARE TOO THIN THAN TOO FAT. (For practical rather than aesthetic reasons or promoting healthy eating…)	
Now you are going to use small squares of mod roc to give the forearms, upper arms, thighs and ankles some rigidity and strength. Cut the mod roc into small strips that will wrap around the tin foil twice. When you have eight strips, dip them one at a time into water and wrap around the tinfoil, with the aim of covering it completely. Leave to dry. (I have used papier-mâché instead of mod roc and it is pleasing to work with and finishes lighter but equally strong – it does however take much longer to work with and dry and many more children struggled with it.)	 

Week 2.

Creating the body section, covering the model with muslin strips and PVA.

Each figure should have defined arms and legs that are movable at the appropriate joints. The next session is about creating a body shape, attaching it and then coving the whole model with muslin strips and PVA.	
Using folded tin foil create a front and back chest section – a bit like a breast-plate on a suit of armour. Once you have front and back you have lots of options. You can fill with cotton wool, flexible foam rubber or anything else that will create bulk without adding weight. Cotton wool works well but make sure the kids don't overfill. On the picture I have also used some packaging foam. My philosophy has been to use whatever materials are available and therefore keep the costs down and encourage creative use of materials. I have adopted the approach of showing the children a method by stressing that they can improvise and use whatever they think works.	 

Once the front and back of the body are on the figure attach with strips of masking tape. Now you can begin to cover the body with strips of muslin. I searched for strips on ebay and discovered that muslin hand-wraps for kick boxing were good (I searched for "kick boxing fight bandage!") and they cost about £1.50 a roll – I suggest you need a roll per figure, but 2 between 3 would do.	
"Ponchos and nappies" is the expression the children liked best for what to start with! Using small strips dipped in a mixture of PVA and water (1:4 or stronger) give the figure at least three ponchos and three nappies. Once they are on, use the roll to wrap up the figures body going round from top to bottom. Aim to cover with a maximum of two layers otherwise as it dries the figure will lose mobility.	
With the body made and wrapped start to wrap up the arms and legs with small amounts of muslin. Cutting small slits into the centre of a strip of muslin and fitting over the arms and legs tightens and strengthens the joins.	
Add a small neck if you like, but make sure it is small or the figure will look very odd. The neck is optional as the heads look fine on neck-less torsos.	

Leave to dry	

Week 3.

Modeling the head, designing and making the clothes.

There are many ways of making the heads. It comes down to personal choice and materials available. I have made them using bits of chicken wire with home made papier-mâché covering them; with air drying clay and with corks as a base with a papier-mâché covering. I have tried both the products shown. They both work but drying time and workability are different. My suggestion would be to use both on cork bases and ask the children whether they prefer the Claycrete or the Sculptamould. (The Sculptamold needs to be mixed correctly and then can be worked for about 10 minutes. Don't be tempted to change the recipe – if it is too dry it sets before it can be moulded!) You could use home made papier-mâché, the pulped variety, but drying time is very long!	 

Either make the basic head shape in one session and then add features in the next, or else make the whole head in one go. I suggest that ears make a useful and reasonably straightforward addition, but easier to add to a dry head than try to incorporate into one that is still malleable.	
When the heads are dry drill a hole into the cork (which ideally will be in the centre of the base of the skull!) Do this yourself and watch your fingers – make sure you don't drill right through and out the top of the head!	

Clothing – get some scraps of material from charity shops, car-boots or generous tailors. I would suggest making very basic stuff to begin with – ponchos with a string belt and simple skirts and trousers. With time you could make more ambitious designs and possibly create the whole cast of the play.	 

Week 4.

Painting the head, dressing the model

When everything is dry you should have a figure that is ready to paint. Although acrylic is more expensive it dries much quicker and the colours are richer than poster paint, so I would suggest using only acrylics for the head. If you are going to paint the body too make sure you have enough colour mixed BEFORE you start painting, otherwise it is very hard to recreate the same colour.	
Pint in as much detail as possible, allowing paint to dry before adding more on top.	
Dress the figures. Set up in postures and scenes. Photograph, film, animate…	 

By Nick Turner