

Making models

Models are an important part of the design process for any project. They are not simply the final design solution.

Models can help students appreciate how spaces are used and identify problems that may arise from the interaction of different users.



They can be used as a means of communicating proposed solutions, highlighting special features, materials and colours. Most importantly, a model is informative and brings a building, object or place to life off the plan.

Planning

The most important step for any model making project is to establish a clear purpose for the model. What is the model for and what does it need to communicate? There is always a temptation to show every detail in a model, when it's more effective to highlight the most important aspect of your design. An architectural model can show how the entire building sits in the environment without showing all detail or it could highlight one interesting area of the building. A sectional model can explain the relationship between exteriors and interiors. The important thing is to start with a clear purpose for your model. What do you want it to illustrate and what sort of model will achieve your goals?

Scale

The next step is to choose the most appropriate scale for your model. Don't let scale scare you. Scales are actually very simple and once established will make sense of your model. The scale of a model is a ratio, in other words, the relative size of the model to the real thing. For example, 1:1 scale (we would say this as 'one to one') would be a life size model. Whereas, 1:10 scale ('one to ten' or 'one tenth scale') would be one tenth of actual size.

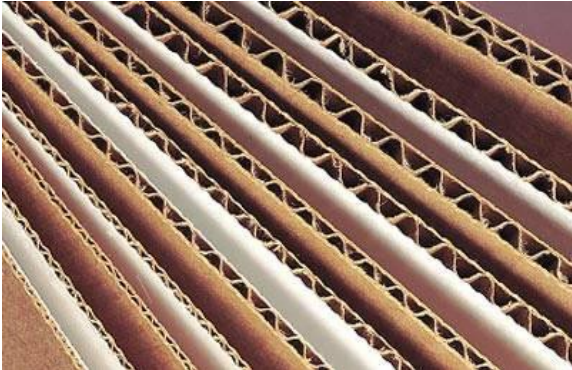
The larger the scale indicator number, the smaller the model, which means less detail can be shown. If you need to show a large landscaped area, you might choose the scale 1:500. If the purpose of the model was to show a building, you would consider 1:200 or 1:100. At these scales you can show windows, doors etc. If your goal is to show detailed elements of the building you may need to go to 1:50 or 1:20.

Scale	Purpose
1:500	Large landscaped area
1:200 or 1:100	Building
1:150 or 1:20	Detailed elements of a building

Tools and equipment

Card

Store bought card comes in a variety of thicknesses, colours and textures. For example, you can buy fine corrugated card to represent corrugated iron on roofs or tanks. Recycled card is perfect for model making. The card used for cereal boxes, egg cartons and toilet rolls can be used in a variety of ways on a model and is handy to have in your collection. The corrugated card from a carton is a common material for building up landscapes around your model.



corrugated card



black, white and coloured foamboard

Foamboard

Foamboard is used by designers and architects for model making and presenting work. It's easy to cut, light weight and gives a crisp, professional finish to a model. Purchased from any good art supply store, it consists of a central core of foam with thin card applied to either side. Foamboard comes in a variety of thicknesses with 5 mm being the most common. Foamboard is cut using a metal ruler and a blade.



simple foamboard model

Balsa

Balsa dowel and strips are useful as connectors or frames in a model although foamboard tends to be easier to cut.

Detail materials

Windows and areas of glass can be indicated by using acetate, small pieces of acrylic or simply cutting plastic off the cover of a folder. Old folders come in a range of textures and colours and a pale opaque blue makes a very effective window in a model. Collect bits and pieces of scrap rubber, bottle caps and fly screen for your model supply box.

Scale ruler

A scale ruler is a vital piece of equipment for all model makers.

Metal rulers or steel straight edge

Plastic and wooden rulers will be damaged by blades. A metal ruler also supplies a weight to what you're cutting and you're less likely to slip and cut yourself.

Try-square, T-square or setsquare

Keeping the individual pieces of your model square is crucial to making the edges of your model meet cleanly. Use a square throughout to check your model.

Cutting mat

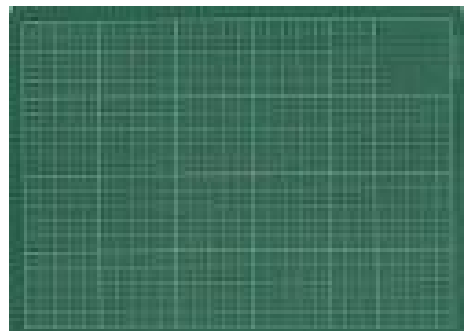
These can be used repeatedly and save damaging table tops and blades. The grids also help with squaring up small pieces of card or paper. Available in A1, A2, and A3 and purchased from any art supply store.



scale rulers



metal ruler



cutting mat

Cutting tools

Craft knives, Stanley knives or scalpels are the best way to cut card or foamboard.



craft knife



scalpel

Always use them with a metal ruler and stand up and over what you're cutting. Keep the knife blade vertical when cutting to produce neat joints. Whether you're cutting with a craft knife or a scalpel, it's better to use several light passes rather than trying to cut all the way through with one go. You'll get a cleaner cut and you're less likely to slip and cut your finger. As soon as you feel a blade 'drag' on card or foamboard replace it, as a ragged cut will spoil the appearance of your model.

Scissors can be used for cutting small pieces of card and acetate.

Circle cutters can be purchased from art supply stores and are used to cut circles cleanly from foamboard, a difficult thing to do with just a craft knife.

Retaining tools

Basically anything that holds the item in place whilst the adhesive sets. Useful items include dressmaking pins, paper clips, paperweights and masking tape. These can also be used when checking how the model will look prior to gluing.

Adhesives

PVA glue is the most useful model making adhesive available. It forms a quick, strong bond and is ideal for covering large areas. It's also inexpensive and a lot goes a long way. Any excess can be cleaned using a damp cloth while the adhesive is still wet. It can also be diluted and used as a sealer over surfaces and edges, as it dries clear.

If you want to remove a foamboard section of your model after it's been glued, lightly run a scalpel along the join and base and carefully cut out.

Spray adhesive is the best way to apply paper to foamboard, e.g. fixing a plan to the base of your model or fixing textured paper to foamboard to create a wall. Stick glues can be over used or not evenly distributed, leaving visible lumps under the paper being fixed. Repositionable spray adhesives are expensive but allow you to peel the paper off to make alterations without tearing.



repositionable spray adhesive

Bases

Models should always have a solid base. For small models up to A3 in size you can use foamboard. Anything larger it's best to use craftboard, cut to size in a workshop. A base can also be made from layers of corrugated card cut to indicate the sloping terrain. Always paint a craftboard base first before attaching the model.

An effective technique for painting a base is to paint one coat of a dark shade, say in green, applied with a roller and left to dry. Take a sea sponge, torn into a workable size and lightly dip into a lighter shade of green. Now dab the sponge onto the base leaving a textured pattern. Let dry and add a lighter shade.

Scoring card or paper

Scoring creates a fold or line in card or paper, e.g. if you were making bi-fold doors or folding furniture into shape. The easiest way to do it is with your finger nail or edge of a ruler.

Creating vegetation

Trees and bushes can be made from sea sponges, broken into small sections and lightly painted with a few different shades of green, much cheaper than store-bought model vegetation. Sea sponges can be purchased from \$2 shops, hardware stores and chemists. Simply brush some PVA glue to the base of the sponge and apply to your model. Tree trunks can be made from found twigs with sea sponge attached. Scale is still important here. Check that the tree or bush is the right size for the scale of your model. To get a 'tree' to stand properly, drill a small hole into the craftboard base, add PVA glue then the tree.



hot glue gun

Hot glue is also useful for applying vegetation. To indicate fruit on trees or flowers, add small pieces of coloured paper. Again scale is important.



sea sponge trees and corrugated card tanks



natural sea sponges

Tanks

Water tanks can be made by cutting two circles of foamboard to scale and gluing a strip of corrugated card between them to create the sides of the tank. Use pins to hold in place until dry.

Water

Pools and ponds can be made from blue acrylic or a sheet of blue plastic.

Fences

A simple post and rail fence can be made from bamboo skewers cut to length (the posts) or craft sticks (matches without heads) with wire evenly separating each 'post'. Use a hot glue gun to fix 'posts' in place.



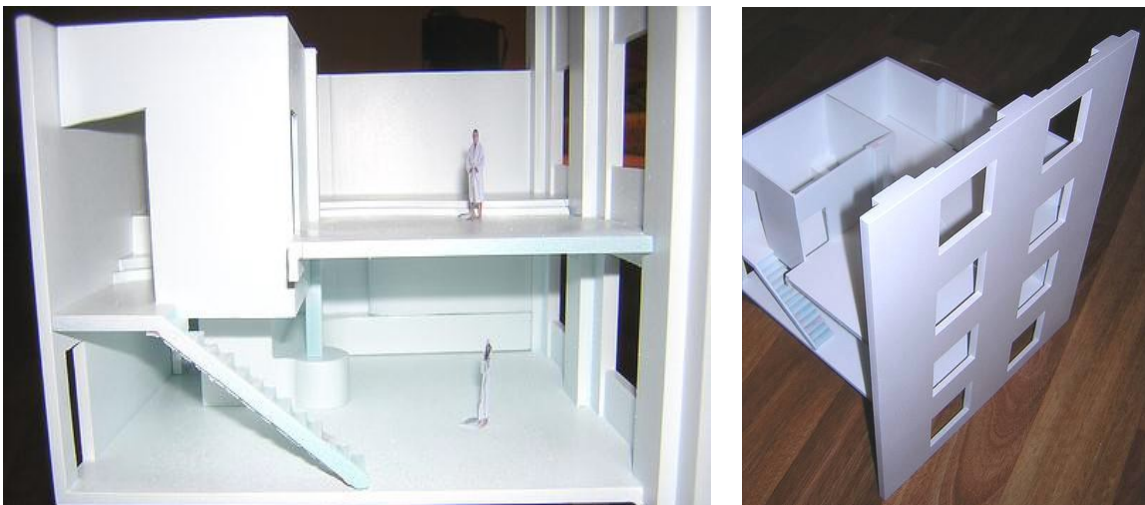


foamboard model and foamboard presentation boards

Courtesy: Strathfield South High School 2006

A suggested process for making a simple model of a house

- Draw a plan to scale or create one with a CAD program.
- Photocopy plan and trim around edges.
- Paint the base if desired. Determine where the building will go on the base. Do you want to show surrounding landscape? Should the plan be centred or to one side? Using spray adhesive fix plan to either a foamboard or craftboard base.
- Measure and mark out your walls, length and height, on foamboard using a scale ruler, square and pencil. If you already have the elevations drawn, photocopy these and glue to foamboard.
- Using a cutting mat, steel ruler and blade, cut out walls.
- Check walls are the same length as those on your plan. Trim to fit if necessary.
- Cut out any doors, windows or openings in your elevations.
- To glue walls to plan start with one wall and lightly paint the base and one side with PVA glue. Paint base and one side of the second wall.
- Carefully place the two walls onto the plan and hold corners together with one or more dressmaking pins. Once dry these pins can be removed.
- Wipe up any excess glue with a wet rag.
- Continue the same process with the third and fourth walls.
- A simple roof can be made with store bought fine corrugated card. Make sure you make the roof larger than your plan to allow for eaves. Roofs can be simply attached with pins through the card into the foamboard. This allows you to remove the roof to view internal details.



Courtesy: Design Centre Enmore TAFE 2008



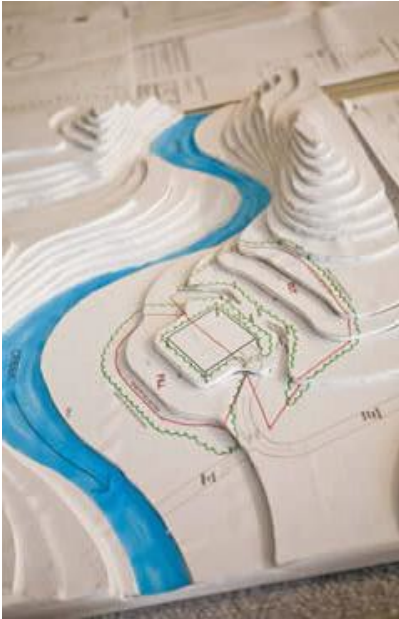
Courtesy: Strathfield South High School 2006



Courtesy: Lidcombe College TAFE 2008

Helpful hints for managing modelling activities in a classroom

- Be realistic about what you want to achieve with the time, materials and facilities available to you.
- Keep it simple. Don't try to make every detail of your design.
- Use scale. Models without scale are difficult to understand.
- Keep it simple with colour. Don't build a doll's house.
- Most professional models are monochromatic (white).
 Colour can be added if it's important to the overall design. If you have a special feature in your model this could be the only coloured area, e.g. a model of how water is distributed through a building. Foamboard comes in a range of colours or using spray adhesive, you can add coloured papers, textures or images to your model. These could come from magazines or printed off the computer.
- Expect it to take twice as long as you anticipated
- Be prepared. Cover areas with newspaper before using glue. Put small amounts of PVA glue in plastic cups rather than handing over the bottle.
- Let students practise cutting foamboard before giving them a large piece. Always stand up and over a cutting mat to stop metal ruler and blade slipping.
- Find the students in your class who like to work alone on repetitive tasks. Give them the fences and trees to construct.
- Ask students to contribute to the model making equipment with recycled boxes, cartons and plastics from home.
- Utilise centres such as Reverse Garbage for a range of industrial scrap; computer parts, plastics, rods, metals, wood strips.



corrugated card base



foamboard model

Courtesy: Lidcombe College TAFE 2008



Resources and Links

Reverse Garbage

8/142 Addison Rd Marrickville, NSW 2204 (02)9569 3132

Reverse Garbage is a not-for-profit co-operative that sells industrial discards, off-cuts and over-runs to the public for creative and practical uses

<http://www.reversegarbage.org.au/>

Australian Centre for Craft and Design

Abundant Education Kit

Introduction to the work of ten contemporary Australian architectural practices.

http://object.com.au/archive/pages/documents/Abundant_edkit_web.pdf

Scale Architecture

Australian architectural practice

Examples of models

<http://scalearchitecture.com/>

Alvar Aalto Museum

9 steps in architecture. Guide to scale, space, materials and landscapes.

<http://www.alvaraalto.fi/museum/pedagoqieng.htm>

The Model Maker's Resource UK

Articles on landscaping and architectural models

<http://themodelmakersresource.co.uk/>

Stephen Wynne Owen

Article - Architectural Model Making for Students

<http://www.modelmakers-uk.co.uk>

Houses of the Future

Sydney Olympic Park

Student Pack