

A **GUIDE** TO
Model Making
FOR THE
LANDSCAPE ARCHITECTURE
STUDENT

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A GUIDE TO MODEL MAKING FOR FOR THE LANDSCAPE ARCHITECTURE STUDENT

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ABSTRACT

We are living in a world where the output rate of digital products are quickly outnumbering handcrafted art. Much emphasis is being placed on mastering CAD programs and design software. Though they are important, it does not mean we should completely forget the methods of old. Before the age of 3-D modeling programs, designers had to construct scale models by hand. Model making is a beautiful and intricate art that is dying in a society that places so much importance on the digital world. Here at the UC Davis Landscape Architecture program, some students graduate with the experience of only one built model under their belt.

My study on model making hopes to give it a fresh perspective and new life by demonstrating techniques to create this element in our design process. I want to provide the Landscape Architecture students with a guidebook that can help beginners build models with confidence and offer new tips and ideas for those already with experience. The experience of modelmaking is a useful advantage not to be overlooked for those seeking to enter the professional world.

DEDICATIONS

*To my parents,
for letting me *decide* for myself.
Always supportive,
but *never* holding me back
or pushing *me* the other way.*



1990



2008

ACKNOWLEDGEMENT

thank you

My roommates- for insisting that I work and always providing me with *food*.

Nouton- for always *encouraging*.

Patsy Owens- for her *time* and *help*.

Steve McNiel- for his *enthusiasm*.

Byron McCulley- for being a *lifesaver*.

Peter Xiques- for *surviving* through it all.

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INTRODUCTION

Model making is often an overlooked craft in the design process of landscape architecture. We are obsessed with cranking out visual representations in the form of plans and graphic illustrations. Although these two-dimensional graphics are necessary and important, the use of a 3D model can intensely enhance the experience. Models create a real sense of space, where the viewer can enter and explore. Contrary to popular belief, models do not always have to be costly. They can be built using many items found in and around the house. As a student, I know that saving a few dollars can go a long way, and I intend on showing you just how to do that.

This guidebook aims to find model making its place in the design process of landscape architecture. It will be a starting point for beginners as well as a resource for more experienced model makers. Here, you will find techniques for building various aspects of a model as well as advice for when to use a study model versus a presentation model. The following pages will include step-by-step instructions with photos and sketches to help clarify the process for each different method. I have also developed an overall rating scale based on the following four attributes:

- 1) Aesthetic Appeal
- 2) Monetary Expense
- 3) Level of Difficulty
- 4) Time Constraint

The rating score will be based on a scale of 0 (worst) to 10 (best); for example, a 10 in aesthetic appeal means it looks great while a 1 in monetary expense means it is very expensive. This gives you an idea of how much time and work you will be putting into the project and the quality you can expect to receive from the finished product.

INTRODUCTION

Also included is a list of places where you can find resources within Davis and its surrounding area. There are many things that can be made at home rather than buying generic, overpriced merchandise from hobby shops. But some things can only be purchased at the store, such as flock and clump foliage. When low on time, ready-made figures and cars can be purchased there as well. These resource locations will also be rated based on:

- 1) Selection of Materials Available
- 2) Prices
- 3) Customer Service
- 4) Proximity to Davis

In the end, I hope you will find a new interest and appreciation for the art of model making. There are unlimited possibilities beyond this guide for you to discover and explore. Remember to be resourceful, stay patient, and push your creativity.

RESEARCH

THE ROLE OF MODELS

A model is the physical representation of a concept, whether realistic or abstract, with the intention of modifying, viewing, testing, and conveying its design. The end result of a project is a built three-dimensional space, which makes building a three-dimensional scale model the most sensible representation of a developing work. Compared to other forms of representation, it is the closest to a real, physical thing (Moon, 2005). It acts as the miniature form to ensure that the design can be built and to show what the finished product may look like (Mace, 2007). Models allow the client to instantly see the design without having to shift through a stack of different images. The onlooker can view the model from different angles and even walk around it. It is important to view models at eye-level because in real life the design is not seen from atop (Neat, 2008). Also, placing a model at the center of a table promotes sharing constructive ideas from divergent viewpoints; a person's view from one position at the table is not the same as the perspective of another person from the opposite end. That person sees something completely different, allowing them to be more engaged and open up discussions (Moon, 2005).

With the onset of modern technology and interactive computer fly-bys, one might wonder if scale models are still an effective means of communicating the design. The answer is yes. Scale models have advantages over other forms of representations although it is best to have a combination methods working together in a studio to convey the design to a client (Moon, 2005).

There are two basic types of models: study models and presentation models. The study model, as it is called, is used for studying. It is a step up from drawing on paper to help you study and visualize the space, resolving the issues in the initial design stages. Created from simple and cheap materials, it should be built relatively quick and free of details, focusing on the layout and the interaction between the different elements. (Mace, 2007) Throughout the entire design process, the study model may be modified multiple times or completely rebuilt, according to changes in the design (Yan 2009).

THE ROLE OF MODELS

When drawing on paper, designers can leave areas undefined and lines unfinished. However, when building a model, the entire design must come together. A study model is an efficient way to help work out any problems or uncertainty in the design. Constructing the design will allow one to move pieces around and view the space from all angles to see what will work best (Day 2000). As stated by Karen Moon, “Designing by model making lets you face the problem directly and embrace the spontaneous and serendipitous”(Moon, 2005, p. 51).



A-1 Study model made out of foam for Mountains Housing Project by Zvi Hecker, 1994-2001
© Karen Moon

Whereas the study model is used to generate ideas, the presentation model is used to communicate those ideas to outsiders. It is the finished model one would show to a client. However, a presentation model that is shown to outsiders, but still retains a



A-2 Modular Housing Model at 1:600 scale
© Invermodels

moveable, study model quality is called a modular model. These models consist of components that are interchangeable and moveable without disturbing the overall model. Elements can be replaced, added on or taken away (Moon, 2005). It is used most often in new model homes and development offices where it provides an easy method to convey current and future development phases with potential buyers. The moveable characteristics of modular models also make them a powerful participation component in community workshops. It gives the community

THE ROLE OF MODELS



A-3 Presentation model by Michael Graves & Associates, 1993
© Karen Moon

members a chance to view, play, discuss, and edit the design. This interaction with the model allows them to become more involved with the design, process and overall project.

A variety of materials can be chosen from to fit the details of what the model is trying to portray. Different tree forms, brick colors, and paving finishes can now be fully understood by others. Sometimes, however, it is better to simplify the details in order to get the bigger concept across. For instance,

instead of trying to replicate bricks, simple, clean white buildings will help the viewer concentrate on the forms of the design. Models can vary from being realistic to abstract and still be powerful. Most people are aware of how things look but are not conscious of the minute details. By having the right form and proportions, the model can fool the eyes of the viewer without having to depend on the use of much detail. At the same time, a vague form can become convincing if there are enough details. It really is a balance of the form and details that procures a good model (Neat, 2008).

The presentation model not only conveys the design, but also the architects themselves. It is a representation of his or her personality, style, artistic talents, and outlook. Depending on the builders, models can be very simple to ornate, realistic to abstract, and colorful to subdued. The materials they choose to use, or rather not use, reveals subtle traits about the artist. Natural materials may suggest environmental awareness, while metals speak of modern and high-tech views. The model, whether intended or not, can become a very personal extension of the architect's being (Moon, 2005).

SCALE

Models come in a variety of scales that provide both advantages and shortcomings. Smaller models provide a wide visual viewpoint that may be nice, but unrealistic in real life. It may assist in circulation questions and spatial relations, but it will not convey the finer details of the design (Moon, 2005). Larger models may be easier to understand, but they lose the charm found within miniature models. Smaller scale models give a sense of fine craftsmanship, which is intriguing to the viewer. Like dollhouses that offer delight and mystery for children, adults are attracted to miniature models (Moon, 2005).

Devising the right scale is important for a successful model. If the project does not come with a pre-determined scale, it is up to the builder to choose the relative size of the model that will convey the best combination of form and detail. A model at 1:10 will show a lot more details than one at 1:50. Designing a larger scale model means an easier time cutting out details but having to spend more money and time overall. The builder must also be aware of the design to imitate the finer details of the project. A smaller scale gives one the option to omit much of the details. It is the in-between scales that should be avoided since the details can still be seen, but will be very small and difficult to deal with (Moon, 2005). Other factors to consider are weight, ease of transportation, and maneuverability within buildings. In the end, scale determination will be based on how much time, space and money one is willing to spend on the model (Payne, 1996).

It is important that all the objects in your model are correctly proportioned relative to one another. By including figures and cars in the model, it will help act as a guiding tool to keep the different elements in check. If the size of a brick is questionable, set it next to the scale figure to compare its size. The figures allow the viewers to easily see the scale relationship and help reinforce it (Day, 2000).

PAST

Models have been used for various reasons throughout history by artists, architects, statesmen, and kings (Neat, 2008). Miniature models of cities were made while planning for battles and protecting the city. They existed when King Louis XIV constructed Versailles and when the Ottoman empire developed its cities. Highly esteemed, models had a presence unlike drawings and sketches. However, it seems that along the way, the art of model making has been categorized as craftsmen work while drawing plans were elevated to works of artists (Moon, 2005).

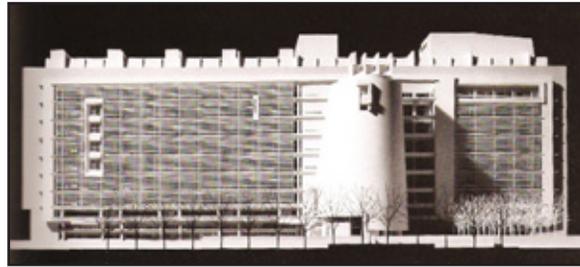
The model, built with wood and capable of being assembled by someone other than the designer, was associated with crafts instead of true art. Art was considered intellectual and possessed the ability to raise thoughts and questions inside the viewer. However, the model was seen merely as a means of communicating ideas. Only later would it be realized that models were also tools used for generating ideas. (Moon, 2005).

Models open up a realm of creativity and freethinking, allowing the builder to experiment with the boundaries of the unbuildable. There exists a strong connection between models and childhood playtime, where there lies elements of fun and freedom, creativity and spontaneity. Like children playing with dollhouses, model builders are given the chance to experiment with their imagination and come up with new expressions (Moon, 2005).

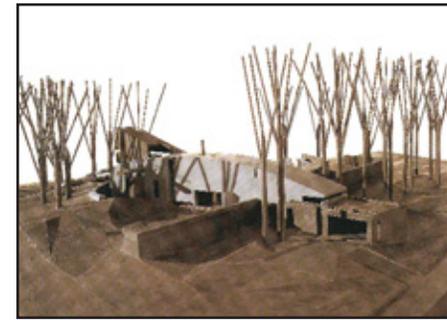
In spite of this, most designers do not welcome the association with the childhood or hobby train-set model. Commercial models, which highly mimic the landscape, became very popular in the 1960s and '70s. Realism in studio models became off-setting to architects because of their link to amateur hobby models. It derailed the focus of the architect as an artist to a common builder with little imagination. This created the rise of simple, white and clean models, which took on more abstract

PAST, PRESENT AND FUTURE

forms. As more artists wished to distance themselves from commercial work, abstraction became more widespread. In the article, "Landscape Models," James C. Rose concluded that for the purpose of study, the representation of vegetation was best when it was abstract, having just enough to provide sufficient realism and leaving the rest up to the power of imagination. This influenced many presentation models from the 1960s that took on an artistic style in their landscape choice (Moon, 2005).



B-1 US Courthouse and Federal Building, NY by
Richard Meier & Partners, 1993-2000
© Karen Moon



B-2 Blades Residence, Santa Barbara, CA,
by Morphosis, 1992-96
© Karen Moon

PRESENT

The style of today's model consists of a blend of both realism and abstraction. Each style has its own advantage in their delivery. Realism allows the design to communicate more easily to the general public while abstraction marks an identity for the architect. By combining both styles, the creators can shine through the abstract elements but relate to the masses with the realistic aspects (Moon, 2005).

Today, the question has gone beyond the debate of realism and abstraction, but rather between the options of physical or computer modeling. Virtual models have become very popular in recent years due to their efficiency in saving space and time. They enable designers to quickly raise a building out of thin air and add intricate details with a touch of a button. Clients can be taken on a tour inside the building and view the outside landscape through a window. Physical models are too

PAST, PRESENT AND FUTURE

small to enter but large enough to take up sufficient space in a studio whereas a virtual model resides safely within the computer. It also provides ease in modifications. Buildings can be lengthened, colors changed, trees added, and windows erased in a matter of seconds. Changes to a physical model can take up to hours or even days. However it is important to note that these “three-dimensional models” are actually flat, being constructed by a series of two-dimensional images. We live in a three-dimensional world and best understand a design through physical models.

It may seem like the size of a physical model and the space it takes up will be a negative drawback compared to a virtual one stowed away in a computer. However, the physical presence of a model actually offers many benefits. It is real and cannot be hidden away with the switch of a button. The architect is forced to look at it even when there is not a desire to do so. It offers thoughtful insight and

time to resolve the issues when least expected. Architect Stefan Behnisch says, “models are always physically visible in the studio, inviting contemplation, comment and change, a process of ripening”(Moon, 2005, p. 208).

In recent years, there has been a surge of technological advances that makes use of computer-aided design (CAD), while still constructing a physical model. Computer numerical control (CNC) milling machines uses CAD drawings to quickly cut and produce parts of models. Using machines to build models offer advantages such as accuracy and extremely fast speeds. These



B-3 Sketchup Three-Dimensional model of mixed-used site, Davis, CA, 2008



B-4 Rendered Perspective of rooftop garden, Davis, CA, 2008

PAST, PRESENT AND FUTURE

machines can do repetitious tasks, such as punching out thousands of windows, while leaving more time for the builder to invest in creative tasks. CNC machines largely produce parts that still have to be assembled by a model maker. However, with rapid prototyping (RP), the human touch is almost completely taken out of the picture. RP uses software files to build the model in layers in just one step. The most popular RP process, known as stereolithography, uses ultraviolet laser beams to solidify certain parts of liquid polymer resin according to a CAD drawing. In the beginning, these machines were only available to large offices, but with a decline in cost, laser cutters can even be found in small offices (Moon, 2005).

FUTURE

Having machines build models for designers may seem like the perfect solution, but in reality, it can become dangerous. By cutting humans out of the process and relying heavily on machines, we lose the chance for interpretation, modification, and experimentation. These processes also require drawings to be made on the computer in advance; a model cannot be simply built from a conceptual sketch. The model maker cannot be simply taken out of the equation. It is a dance between the maker and the model, an art of pausing and reassessing that produces unique characteristics and fine craftsmanship (Moon, 2005). The process of building the model also helps the creator keep in touch with the real world, for real materials are being put together, rather than just “painting” the ground and walls with an image of grass or stone (Day, 2000). The architect is instead confronted with the problem of balancing weight, texture, and colors. There is a smaller chance of constructing a design that would not work in real life if it has already been tested through a physical model, rather than just accomplishing it virtually (Moon, 2005).

Virtual models and physical models are two devices that should be working together. Each offers its own advantages and

makes up for the other's inadequacies. Virtual models are comprised of flat two-dimensional images that cannot offer a complete and coherent view. However, scale models cannot confine the viewer to only the most pleasing view, for it is viewable from all angles. It also cannot give up all the details and specifications in the design. By working together, these two types of models give the clients the most comprehensive presentation of the design. Models will continue to survive as long as designers seek for the best representation of their design. Architect Spencer de Grey believes, "There will always be a demand [for models]. It is difficult to see that fundamentally changing" (Moon, 2005, p. 206).

It is the best form of representation that can communicate to a large range of people. Peter Pran of NBBJ says "[models have] a kind of universal language. Everybody can understand a model...[they] speak to us all" (Moon, 2005, p. 11). It requires no background training for architectural drawings, computer familiarity for virtual fly-bys, or the imagination to stitch a series of perspective drawings together. The scale model is the complete realization of the design, sitting quietly in front of the viewer and designer to explore and understand.

Models will continue to grow and evolve with the changes in materials and technology, but the purpose of the three-dimensional model will not be altered. It will always stand as a communication device. Although fewer are being built today, models are vital tools that can never be completely replaced. They allow designers to visualize relationships between the different elements that would be impossible to do on a computer (Moon, 2005). Most professional studios will make use of models in their design and presentation. Some will have an outside source perform the more complicated tasks, such as laser cutting for precise contour landmasses, but will build the rest in-house (Yan, 2009). Having skills in model making will give you an advantage in conveying your ideas over a competitor who has no experience using this valuable tool.

TECHNIQUES

THE BASICS

TIPS AND GUIDELINES

Start early, the process takes longer than it might seem.

Buy extra materials to save time in case materials are misplaced or damaged.

Keep a clean towel nearby to wipe your hands and tools with. It is important to have a clean model.

While things are drying, work on a different part to be efficient.

Use the least amount of glue you need. It will dry faster and you will make less of a mess.

Change your blades after they get dull to avoid tearing your material.

Cut against a straight metal edge to avoid damaging your other tools.

Apply even pressure and make the least amount of cuts as possible.

Cut on top of a foamboard for your blades to sink into while protecting your table surfaces.

Stand up while cutting for extra pressure and precision.

EQUIPMENT

Architect's scale: a specialized ruler with multiple scales in fractions of an inch per foot.

Circle template: a piece of thin plastic with different sized holes punched in it that establishes or serves as a pattern for tracing accurate circles

Craft knife (figure C-3): a lightweight knife for cutting paper or lightweight materials. Ideal for cutting curves and small details.

Cutting mat: a slip-free mat that will save your surfaces but can be costly. A cheaper alternative is to use a foam board that will allow your blades to sink in.

Drawing board: a smooth surface for your workspace. However, never cut directly on it.

Engineer's scale: a specialized ruler with multiple scales in base 10 units per inch.

Metal ruler: this will come in handy as a cutting edge for straight cuts. The strip on the backing also helps it from slipping.

Pliers (figure C-2): useful in snipping wires, bending tight curves, and picking up small pieces.

Protractor: instrument used to draw or measure angles.

Sandpaper: helpful in smoothing out edges of rough cuts. Sandpaper mounted on boards or a block is sturdier to use.

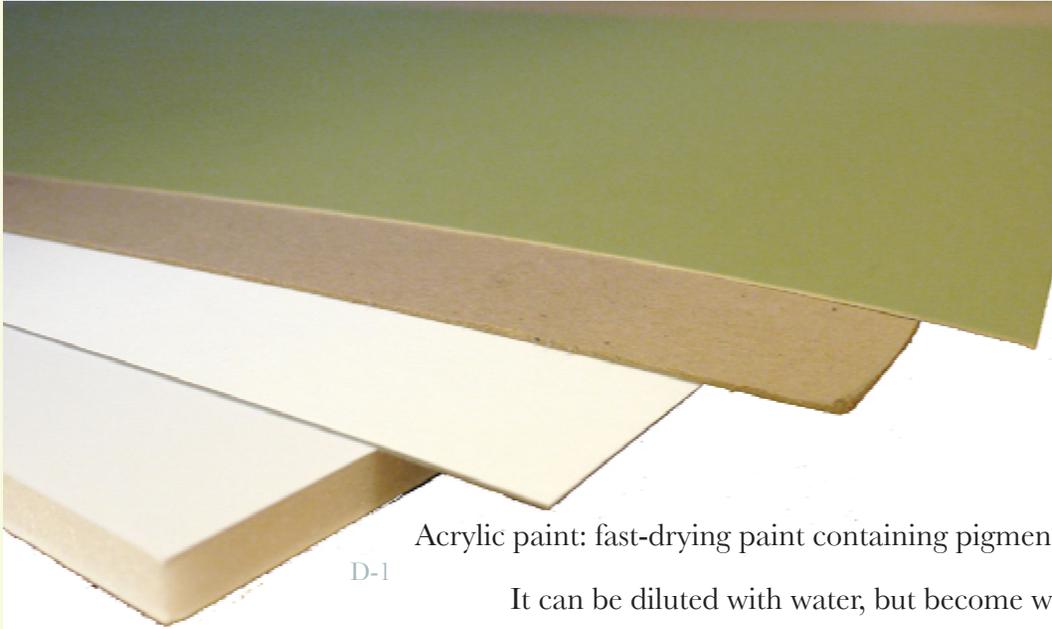
T-Square: a technical drawing instrument primarily used as a guide for drawing horizontal lines.

Triangle- 30-by-60 and 45-by-45: plastic drafting instruments used to draw straight lines at specified angles. Never use your blades against plastic tools.

Utility knife (figure C-1): a heavy-duty knife with a comfortable, sturdy holder, used for cutting thicker materials.



MATERIALS



D-1

Acrylic paint: fast-drying paint containing pigment suspended in an polymer emulsion.

It can be diluted with water, but become water-resistant when dry.

Balsa wood: a strong lightweight wood.

Canson paper: a toothy drawing paper that comes in a variety of size and colors.

Chipboard (fig. D-1): inexpensive, cardboard-type material with uniform sides.

Clump foliage (fig. D-2): makes realistic trees and bushes.

Double sided tape: a mess-free alternative to glue when laying down
paper onto the model.

Dried floral (fig. D-3): makes excellent tree skeletons.

EZ water (fig. D-4): heat-activated beads that form realistic water in minutes.



D-2

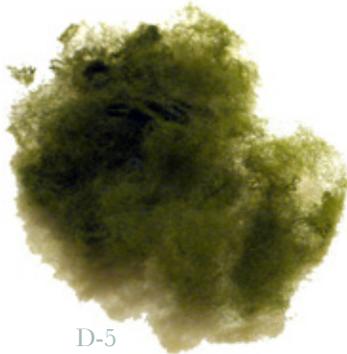


D-3



D-4

MATERIALS



D-5

Flowering Foliage (fig. D-6): adds color to your landscape where there are flowering vegetation.



D-6

Foamboard (fig. D-1): a foam plastic filling between two sheets of slick paper.

Illustration board (fig. D-1): heavy paper good for constructing bases and buildings.

Lichen (fig. D-7): a natural product that makes quick foliage and when torn apart, looks like climbing vines.



D-9

Mat board (fig. D-1): a board comprised of two parts: the core and the paper face.

Poly fiber (fig. D-5): a synthetic fiber that can be used as foliage, undergrowth or vines.

Ready grass (fig. D-8): sheets of grass that is moldable and the turf can easily be scraped off to create roads and pathways.

Scenic cement (fig. D-9): non-toxic water based cement that dries to a clear, matte finish.

Spray Adhesive: fast-drying and easy way to attach flock to trees

Turf grass: imitates low grasses and bushes. It can also be used to add extra texture to trees.



D-7

White glue/PVA (fig. D-9): most common type is Elmer's white glue and Sobo.



D-8

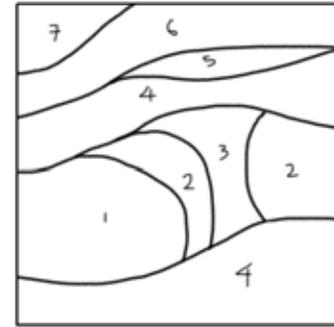
FOUNDATION

FLAT/CONTOUR

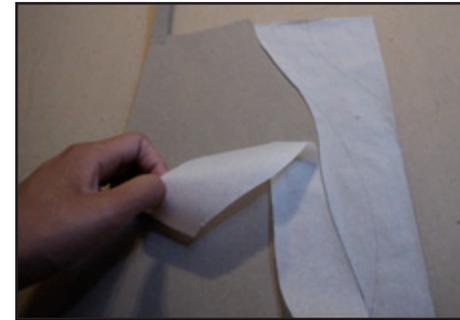
It is important to have a sturdy foundation for your model to sit on. One sheet of mat board will eventually buckle and warp. However, gluing two sheets together will provide a firm base. Foam board also work well and provide an easy base to insert wire trees and other objects. There is also the option of constructing a box base that is hollow inside, but that takes up a lot more work and material that is usually unnecessary. This sort of base can support more weight but is often used for architecture models, which have heavier buildings. When building contour models, you must first decide on the material. Illustration or mat boards can be purchased in different colors to match your model. Chipboard comes in a variety of thickness and is easier to cut.

Solid-Core Contour Bases

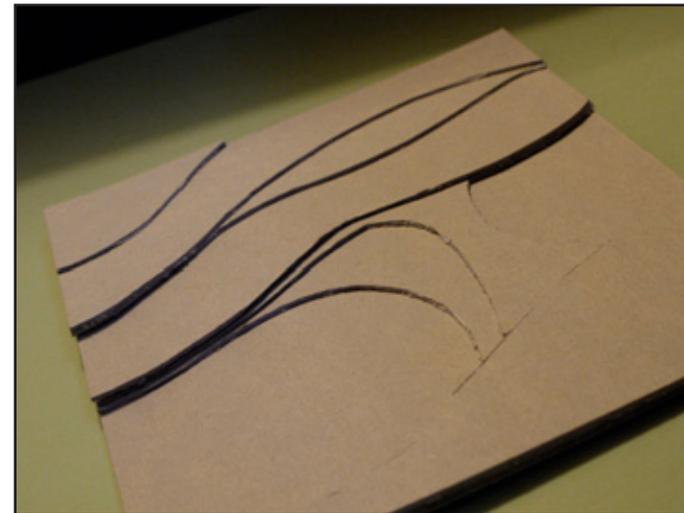
This method cuts out each contour so that it covers the entire base behind the contoured edge. Tape a photocopy of the contour drawing to the board (fig. E-1). Start by cutting out the lowest elevation, taking the paper along with the board, and working your way up until all the contours have been cut (fig. E-2). Assemble the



E-1



E-2



E-3

FOUNDATION

FLAT/CONTOUR

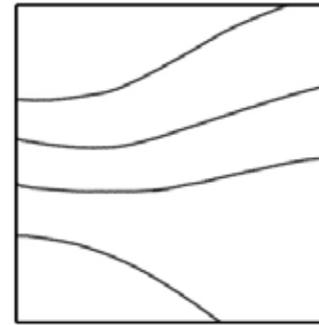
layers with glue and weight them down with heavy books (fig. E-3).

Hollow Contour Bases

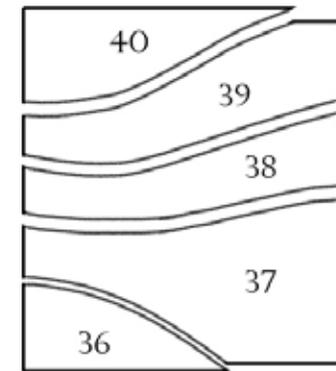
This method takes a bit more time and effort, but saves money in the amount of material needed.

Using a photocopy of the drawing (fig. E-4), label the elevation number and cut each contour out (fig. E-5). Starting with the lowest contour, trace its outline onto the board, adding half an inch to the back edge for overlap (the dashed line). Cut the contour out and continue this until all the other pieces have been cut.

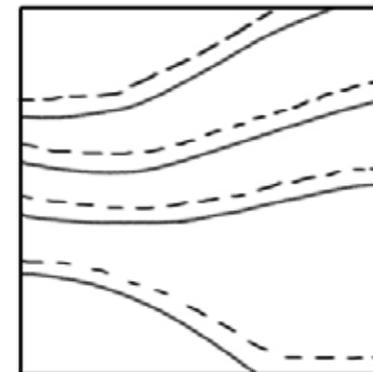
Hollow models need to be built on a base board. Glue the contours together, overlapping the extra edge underneath (fig. E-6). Small strips of board should be cut and piled up to create support columns along the sides. Turn the model on its sides and trace onto another piece of board. Cut them out to cover the exposed sides of the base.



E-4



E-5



E-6

*V*EGETATION

Rating	8
Time	7
Easiness	7
Cost	8
Aesthetics	10

This is one of the more time consuming methods, but it produces beautiful results. This method offers a lot of personal style. No two trees will be exactly alike and minor changes in the way you decide to bend the branches will offer drastically different looks. The first tree you make will be the hardest, but you will easily get the hang of it. Before long, each tree will take less than two minutes to make.

- 1 Get a #25/#26 gage wire. The lower the gage, the more flexible it is to work with.
- 2 Cut 8-16 strands of wire of equal length (The length depends on the scale). The smaller the tree, the less wire you will want to use, else it will become too bulky to twist into shape.
- 3 Gather all of the strands into a bundle and hold the middle and one end of it with both hands using the thumb and index fingers.



F-1

4 Holding tight on the midsection, start twisting from the end. This will form the trunk (figure F-2).

5 On the other end, start shaping the wires out to look like branches (figure F-3).

6 When satisfied, you now have a finished wired tree (figure F-4).

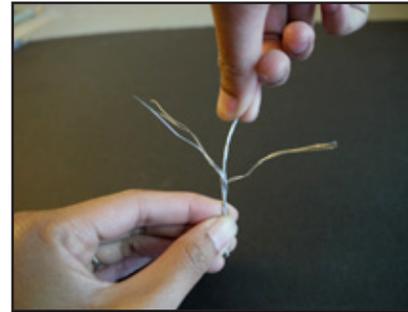
TIP To make twisting easier, a pair of pliers can be used to clamp the wire in place.



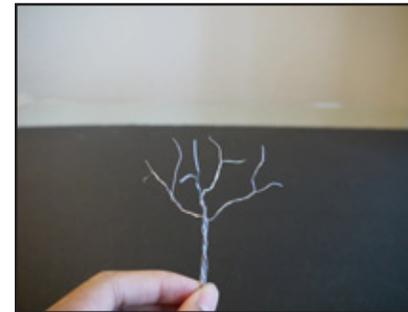
F-5



F-2

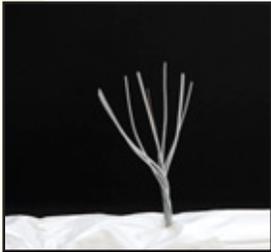


F-3



F-4

WIRE



F-6



F-7



F-8



F-9

Many different styles of trees can be formed using wires.

To develop the tree further, you can:

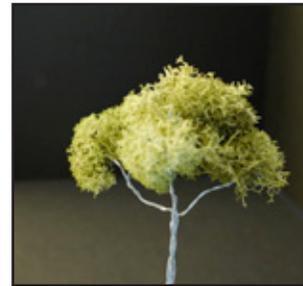
- a. Put a piece of moss on top, tucking it into the branches to form a canopy (fig F-10).
- b. Another option would be to apply spray adhesive and add on flock (fig. F-11, F-12).

- c. You can also use a clump of fine steel wool.

This creates a very soft and clean look (fig. F-13).

- d. Or you could just leave the trees bare. This works well for models with lots of details on the paving and ground level. The bare wire trees will not obstruct the view.

- e. There are countless other ways to address the tree. Experiment with different materials to find what works for you.



F-10



F-11



F-12



F-13

WIRE ABSTRACT

Wire is a wonderful material to make abstract and interesting tree forms. Here are just a few ideas.

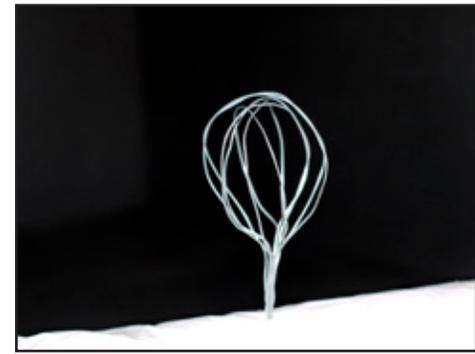


F-14

- 1) Cut 6-8 wire strands twice the length of the tree you are going for.
- 2) Hold the wires together and fold it in half, twisting the ends together, leaving just enough free on top for the canopy (fig. F-14).
- 3) The loops can be fanned out or meshed together to form a sphere (fig. F-15, F-16).



F-15

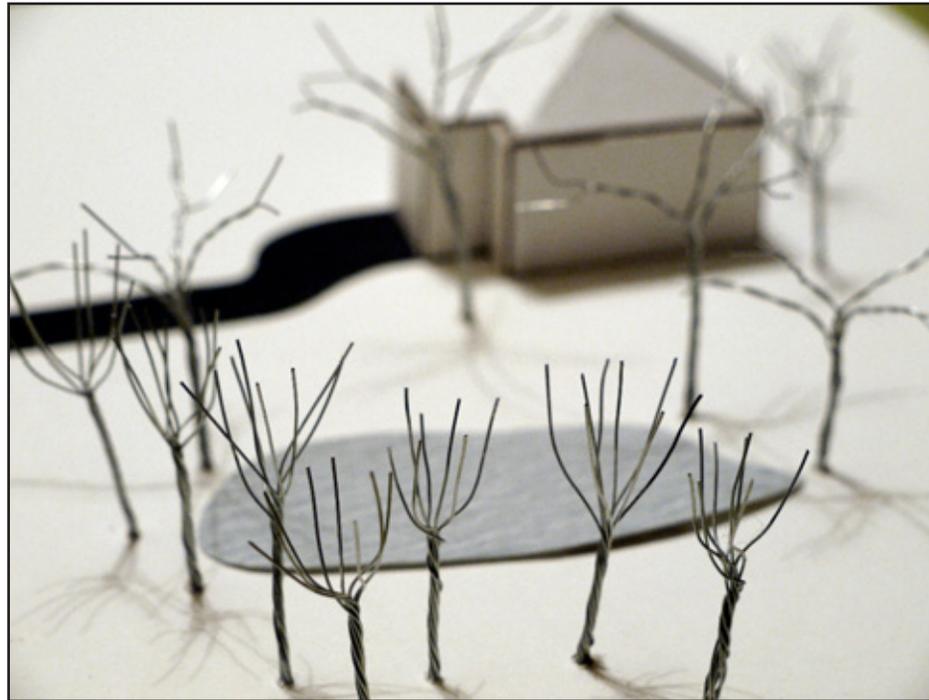


F-16

Aesthetics	Cost	Easiness	Time	Rating
6	8	8	8	7.5

STUDY MODEL WITH WIRE TREES

A study model can be made with very simple materials found within the house. Bare wire trees, sand paper to represent roads and bodies of water, and simple buildings constructed of illustration board provide just enough information.



F-17

PRESENTATION MODEL WITH WIRE TREES

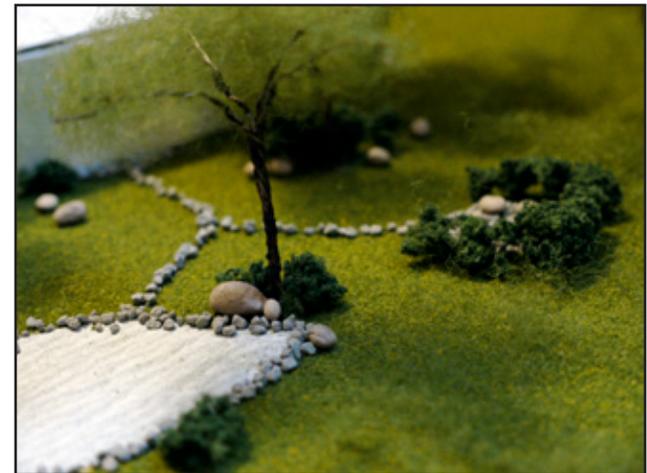


F-18



F-19

Readygrass mats can be scraped off to make roads and pathways. Paint the area in with acrylic.



F-20



F-21

The study model can easily be transformed into a presentation model by adding turf, poly fiber for foliage and details such as gravel and boulders.

Rating
6.25Time
5Easiness
8Cost
8Aesthetics
4

For this you can either print out pictures of trees in the right size from the computer or hand draw your own trees. If you choose to hand draw the trees, they can be photocopied to make more or if you are ambitious, you can draw each of them separately so that no two trees look exactly alike.

1 Print or draw the trees on cardstock paper, having the image on both sides of the paper. Make sure to print each tree in pairs (fig. F-22).

2 Cut around the shapes as close as possible with a pair of scissors.

3 Take each pair and cut straight halfway through the middle vertically. Cut from opposite ends. If you start cutting from the root up on the first of the pair, cut the other from the canopy down.

4 Take the piece from the pair that has the slot on the bottom and slide it onto the other piece from the top so that they form one piece (fig. F-23, F-24).



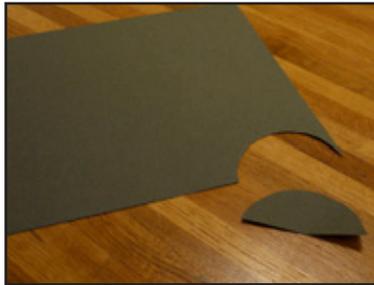
F-22



F-23



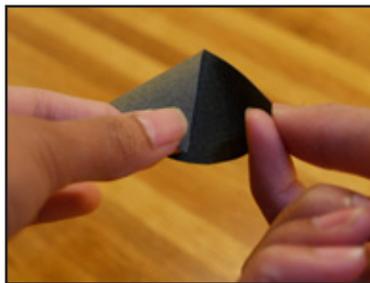
F-24



F-25

These are simple conical trees for study models.

- 1 Cut out semi-circles (fig. F-25).
- 2 Overlap the edges and seal it with a thin layer of glue (fig. F-27).



F-26



F-27

TIP To make it more interesting, you can add strips of paper in a different color around the cone.

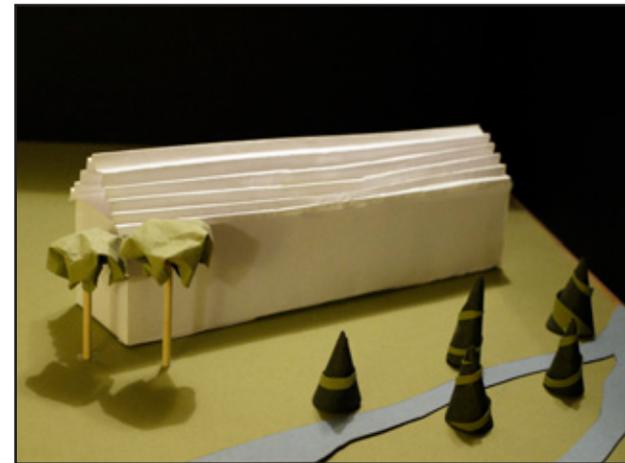


F-28



F-29

To make another quick tree, simply crumble paper scraps into a ball and glue a piece of dowel into the bottom.



F-30

Aesthetics	Cost	Easiness	Time	Rating
5	7	9	8	7.25

TWIGS

Rating
8.75

Time
9

Easiness
9

Cost
9

Aesthetics
8

A relatively fast technique that produces realistic trees.

Go outside and look for shrubs and bushes that have undergrowth on them which resemble miniature tree trunks and branches. Some good plants to use are heavenly bamboos, myrtle bushes and sage brushes. At the grocery store, you can also find oregano and other herbs, that when dried, works as well. Strip the greenery off, leaving just the wooden structure to work with.

1 You may choose to go out and look around for twigs and small branches that have an appearance of a small tree. Sea moss or dried floral found in the floral sections of the store works quite well and is relatively inexpensive.

2 Cover the branches with spray adhesive and submerge it into a bed of flock. If the stem is green, you can also spray paint it brown before adding the foliage.

These branches can be left natural to replicate blossom trees.



F-31



F-32



F-33

These are some examples of plant stems that have been stripped free of their greenery and decorated with clump foliage. To add more interest, you can mix two-three different foliage color for a deeper depth.

Certain vegetation can be dried and still retain their shape. These can be used to imitate bushes and trees. If the color goes brown, spray paint will fix the problem. Experiment first to see what works before using them in your model.



F-34



F-35



F-36



F-37



F-38

SCOURING PADS

Rating 8

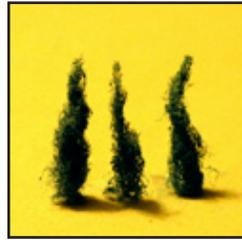
Time 8

Easiness 8

Cost 8

Aesthetics 8

Most households will have a couple of these under their kitchen sinks, if not, they can be found easily at grocery and drug stores for a few dollars.



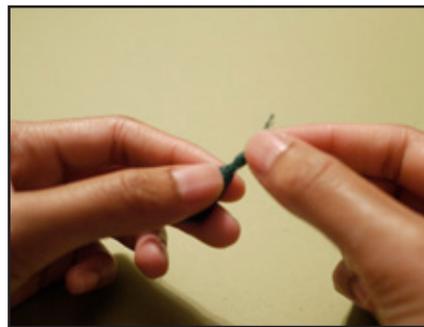
F-39

To make a cypress:

- 1 Pull the pad apart into thinner layers.
- 2 Snip off a corner so that you now have a triangular shape about two inches long (fig. F-41).
- 3 Stretched and twist the material to look like cypresses (fig. F-42).



F-41



F-42

To make a fuller, fir tree, do not thin out the pad. Instead cut a triangular shape and fluff it by pulling the sides out until it looks like a cone. Use a pair of scissors to trim the sides.



F-40

SCOURING PADS

Scouring pads are also perfect for making hedges for edging and formal gardens (fig. F-43). They can be cut out in any shapes such as rectangles, curving lines or round mounds. The size can easily change by pulling off layers or gluing on extra pads. Flock can also be glued on to add color variation.



F-43



F-44

TIP To spruce up the features, you can purchase flower mix (fig. D-6) from model supply shops. They come in a range of colors and easily affix to foliage with scenic cement.

Aesthetics	Cost	Easiness	Time	Rating
9	8	10	10	9.25

SPONGE/LOOFAH

Aesthetics	Cost	Easiness	Time	Rating
7	8	8	8	7.75 SPONGE

Rating	7.25
Time	8
Easiness	8
Cost	6
Aesthetics	7

LOOFAH



F-45

Using a soft dish sponge, you can cut out a shape that looks like a conifer. If you only have the kind with the scouring pad on one side, like I did, you can simply pull it off (fig. F-45). To achieve the right color, it can be spray painted or masked with flock (fig. F-46).



F-46



F-47

Loofahs can be found in the arts and craft section of stores like Walmart or Michaels (fig. F-47). A large piece can be snipped off and attached to a wooden dowel or smaller chunks glued to a wire form (fig. F-48).



F-48

STYROFOAM

This is a simple method that is good for study models. It does a simple job of abstractly representing masses of trees. Small wooden balls would also work.

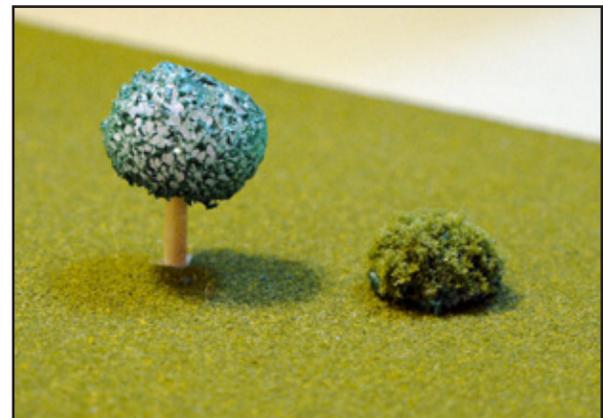
1 Get a bag of Styrofoam spheres in the right scale and insert them into toothpicks or wooden dowels.

2 If you want them to look more realistic, you can spray paint them or cover with flock (fig. F-50).



Tip

You can also cut the Styrofoam balls in half to form mounds or bushes. Also, florist styrofoam blocks can be easily carved to form bushes and hedges.



Aesthetics	Cost	Easiness	Time	Rating
5	7	10	9	7.75

F-50

Rating	6.75
Time	7
Easiness	9
Cost	5
Aesthetics	6

Cork is similar to scouring pads in their ability to imitate hedges. However, they are a bit thicker and should be cut with a utility knife to ensure straight edges (fig. F-51). They can also be cut out in any straight or curving shapes. However, they do need to be spray painted to achieve the right color and flock can also be glued on to add extra texture and color variation (fig. F-52).



F-51



F-52

STRUCTURES

BUILDINGS

BLOCKED

Rating
8.25

Time
8

Easiness
9

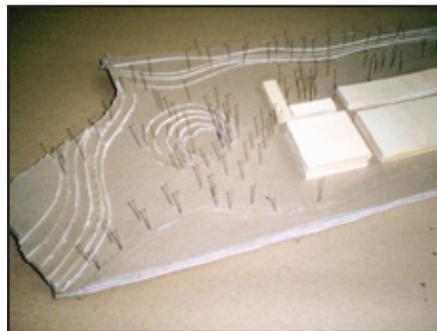
Cost
9

Aesthetics
7

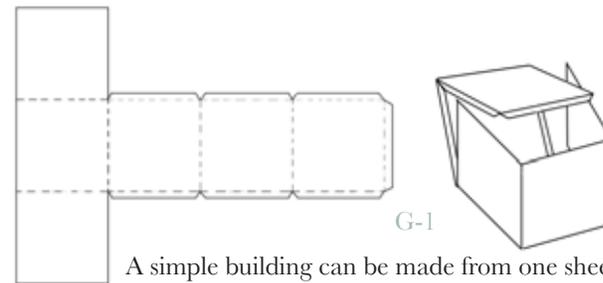
For the purpose of study models, elements should be left very simple or even abstract. Plain white buildings made from foamboard, styrofoam blocks, paper (fig. G-1) or balsa wood (fig. G-4,G-5) are sufficient to represent buildings.



G-4

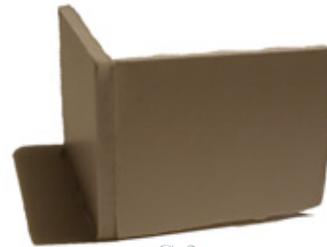


G-5



G-1

A simple building can be made from one sheet of paper.



G-2



G-3

The way the edges of buildings are joined can ruin an entire model if the job is sloppy. If the walls are butted together (fig. G-2), the edges are exposed and is not suitable for presentation models. To create a flush, clean look, bevel out the edges in a 45-degree slant so that only the outer corners would be seen from the outside (fig. G-3). Sandpaper or an emery board can be use to smooth out the edges And remember to use the minimal amount of glue.

BUILDINGS

DETAILED

Even for presentation models, the buildings can be left plain and clean to draw the eyes onto the landscape. However, if the building is part of the overall design, it would be a good idea to show the details. Blocked and detailed buildings can both be equally good. A simple building will not distract from the landscape design while a detailed one can add to the overall appeal. Windows, doors and texture can be printed out and taped onto the building. Craft paper with the right design would also work. More intricate building details could be sculpted out of clay or wood.

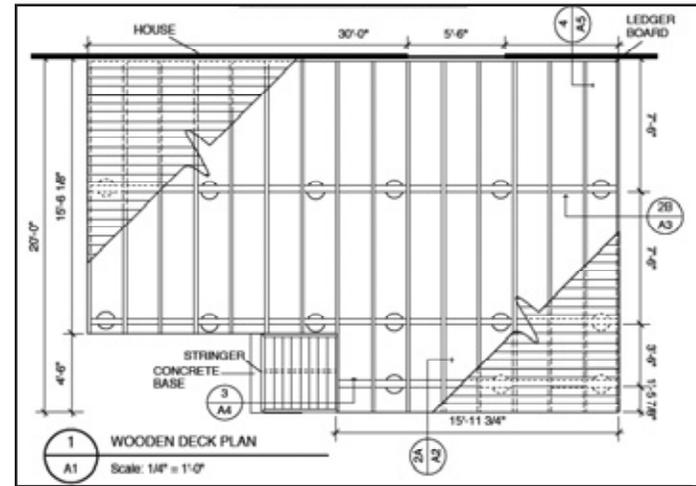


G-6

9	Aesthetics
8	Cost
9	Easiness
7	Time
8.25	Rating

DECK

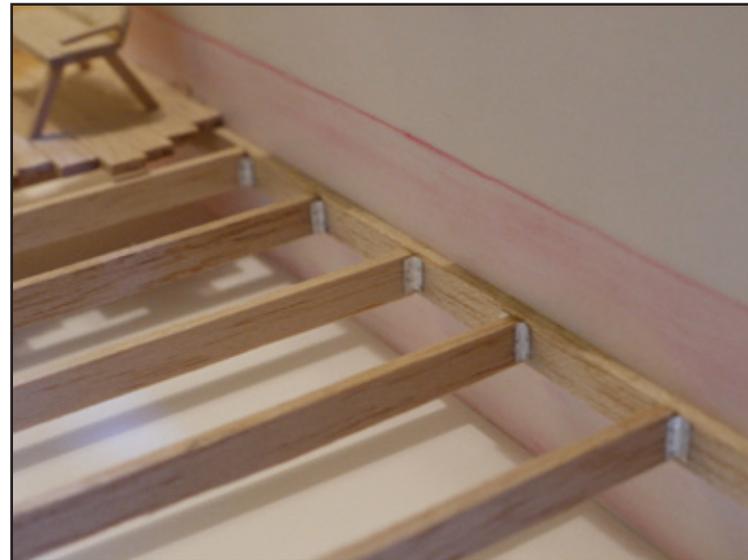
Decks can be a little more difficult to build, but will be easier if the details have been worked out already. First, make sure the design of the deck is finished and laid out so that you can easily check to see what piece goes where (fig. G-7). Balsa wood is quite cheap and easy to cut with a craft knife. Kitchen foil, or even better, gum foil, can be used to create quick, metal brackets on the deck (fig. G-9). Adding details like a bench or figure on the deck will help keep the scale correct (fig. G-8). To take it a step further, the deck can be stained the proper color.



G-7



G-8



G-9

Rating	7.75
Time	6
Easiness	8
Cost	7
Aesthetics	10

*H*ARDSCAPE

SANDPAPER

Rating	8.5
Time	9
Easiness	9
Cost	8
Aesthetics	8



H-1

Sandpaper is one of the best materials to imitate hardscape. You can find them in a wide range of colors, textures, and sizes. Sand, asphalt, concrete, and stone can all be represented by sandpaper. The paper is also thin enough to be easily cut by scissors.

CRAFT PAPER



H-2

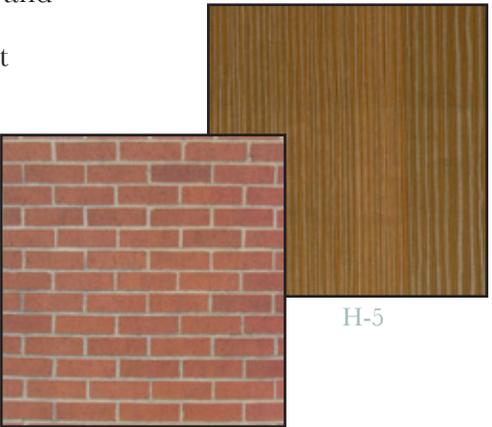


H-3



H-4

Another place to look for ideas would be at paper craft stores. Colored canson paper, specialty paper and scrapbook paper could also be used. You can easily find brick and stone patterned papers at these stores. However the trouble is finding patterns that match the correct scale. If the scale is off, it will be visually distracting.



H-6

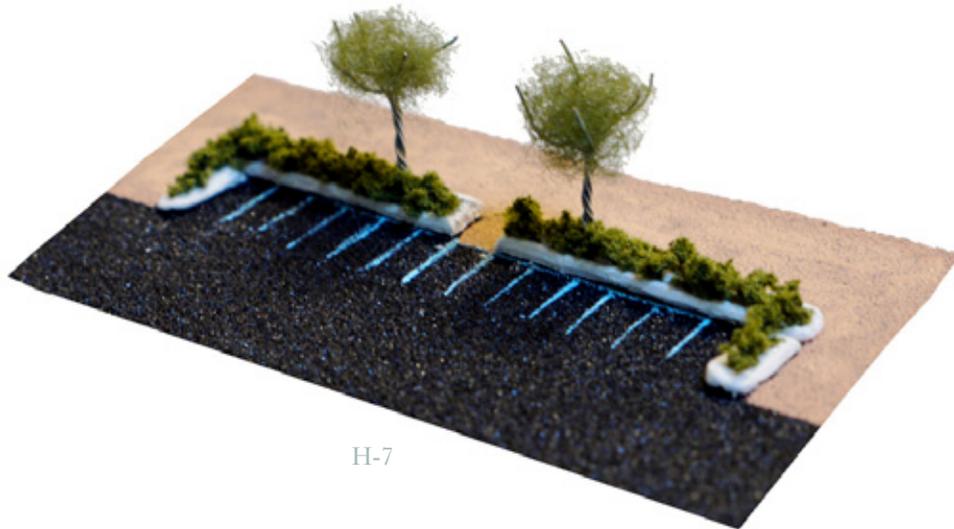
H-5

Aesthetics	7	Cost	7	Easiness	10	Time	9	Rating	8.25
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PARKING LOTS

For parking lots, sandpaper nicely imitate the texture of asphalt (fig. H-7).

Plain black paper will also work. Draw the guidelines in with a very small paintbrush and a straight edge for consistency. A white-out pen would also work wonderfully.



H-7

Modeling clay can quickly be molded to form flagstones and other stepping stones. They also offer the versatility to be painted any color you wish. Roll the clay into tiny balls and then squish them flat with the palm of your hands. Bake them in the toaster oven for about 10 minutes or until the color is right (fig. H-8).



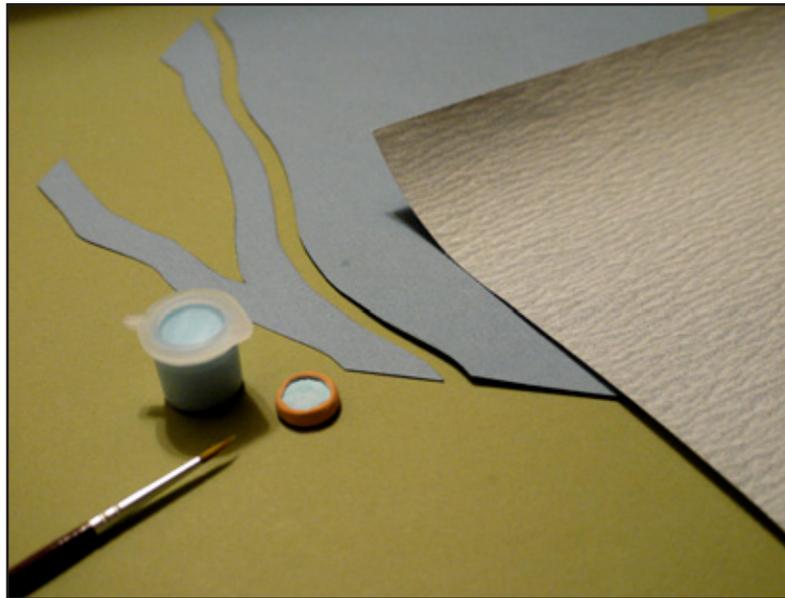
H-8

*W*ATER

PAPER/PAINT

	Aesthetics	Cost	Easiness	Time	Rating
PAPER	8	8	9	9	8.5

The easiest method to portray water would be to use blue canson paper. They come in a variety of sizes that will work for the size of your project. Light blue sandpaper that has a rippling water texture also works wonderfully. Acrylic paint would be the better choice to color in smaller objects such as water fountains.



I-1

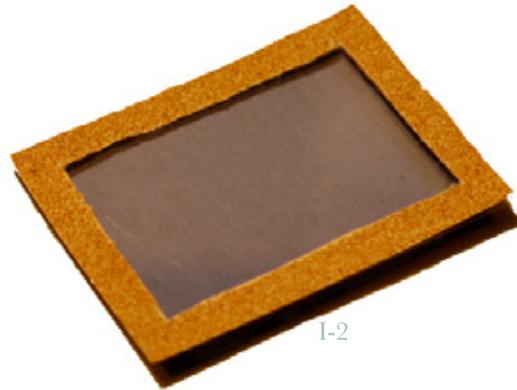
TIP

Don't use bright colors to represent water. It looks very unrealistic and jarring to the eye.

Aesthetics	Cost	Easiness	Time	Rating	PAINT
8	7	8	7	7.5	

PLASTIC/GLUE

	Aesthetics	Cost	Easiness	Time	Rating
PLASTIC	8	7	9	9	8.25



To create more of a sheen that will imitate the reflective properties of water, a piece of clear plastic can be added on top of painted surfaces or colored paper (fig. I-2). Another method is to spread a very thin layer of tacky glue onto blue canson paper. It will dry clear, leaving you with a shiny surface (fig. I-3).



I-3 Thin layer of tacky glue spread on the right side of the paper

GLUE	Aesthetics	Cost	Easiness	Time	Rating
	9	8	9	8	8.5

EZ WATER

Rating

7.5

Time

7

Easiness

8

Cost

5

Aesthetics

10

This technique produces realistic-looking water but is a little more expensive when compared with paint or paper.

1 Carve out the shape for the water.

2 If you decide to paint the area in, make sure it is completely dry and seal it with scenic cement. Make sure the cement is also completely dry before pouring in the EZ water. If the paint isn't dry, it will cause a very bubbly and expansive reaction with the water mixture.

Or

You can mix in blue dye to the EZ water mixture while it is heating up and not have to worry about the paint reaction.

3 On the stove or toaster oven, using a disposable aluminum pan, heat up the EZ water on low heat. Stir the mixture to ensure even heating. If smoke starts to appear, it is getting too hot (fig. I-4).

4 Once it is completely melted, cool the mixture a bit before pouring it into the cavity (fig. I-5).



I-4



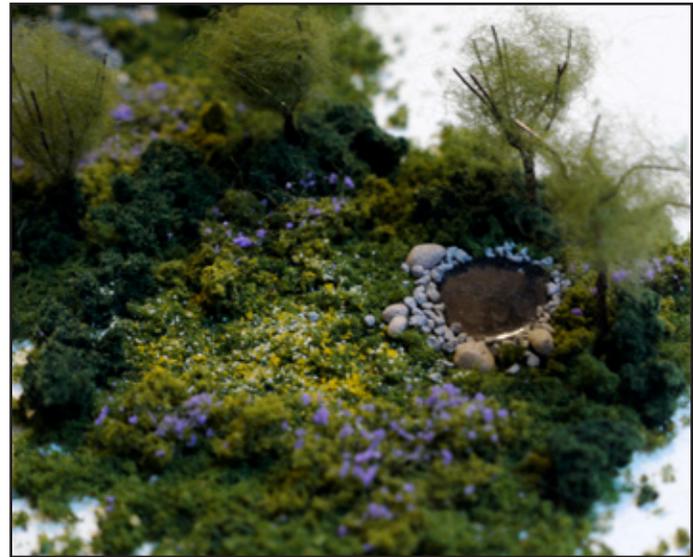
I-5

5 Using scenic cement, a woodland landscape can be created by adding turf, flowers and pebbles.

Remember to layer different shades of vegetation to break up the landscape and create a pleasing look.



I-7



I-6

*D*ETAILS

PEOPLE

WIRE

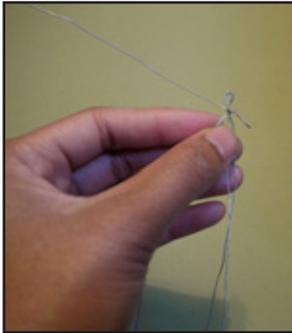
Using wire to make figures is very common, and it provides a cohesive look for models where wire trees are also being used.

Rating	7.75
Time	7
Easiness	7
Cost	8
Aesthetics	9



J-1

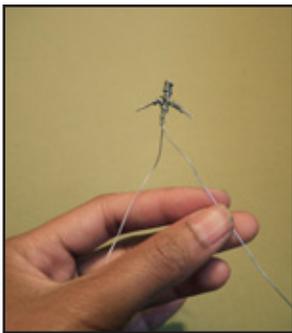
1 Cut two strands of wire about 10 inches long each with a pair of scissors or pliers. Holding the two strands together, fold it in half and twist the top to form a loop. This will serve as the head (fig. J-1).



J-2

2 The four strands hanging will be used to create the arms and legs. To make the arm, fold one of the strands over, leaving just enough for an arms length. Twist the arm strand, using some of the excess wire to thicken the upper arms. The rest of the wire can be wrapped around the head for extra bulk (fig. J-2).

3 Do the same for the other arm, but this time use the extra wire for the trunk of the body (fig. J-3).

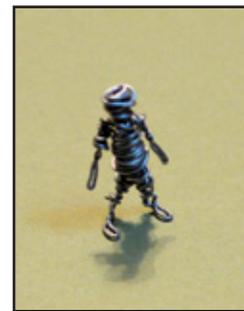


J-3

4 Do the same for the legs, folding the wire at the approximate leg length and twisting it. Use the excess wires to build up thighs and the trunk of the body (fig. J-4). Any extra wire can either be clipped off or inserted down the leg and into the base for support.



J-4



J-5

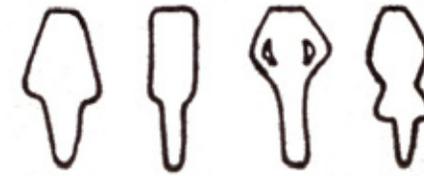


J-6

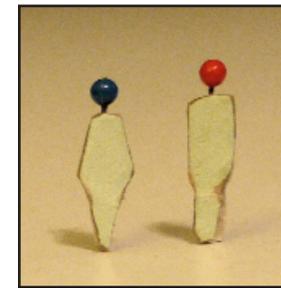
PEOPLE

PAPER

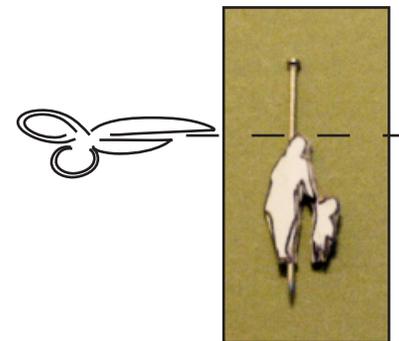
Using simple headless shapes to represent figures on illustration boards (fig. J-7), pins can be inserted, having the pinhead represent the head of the body if the scale is right (fig. J-8). Also, flathead pins can be inserted into full-body figures with the top of the pin snipped off to be flush with the figure (fig. J-9). The pin protruding from the bottom can then be inserted into the model (fig. J-10).



J-7



J-8



J-9



J-10

TIP

Figures can also be drawn on lighter weight material such as cardstock, leaving a tab on the bottom that be glued into a slit made in the model.

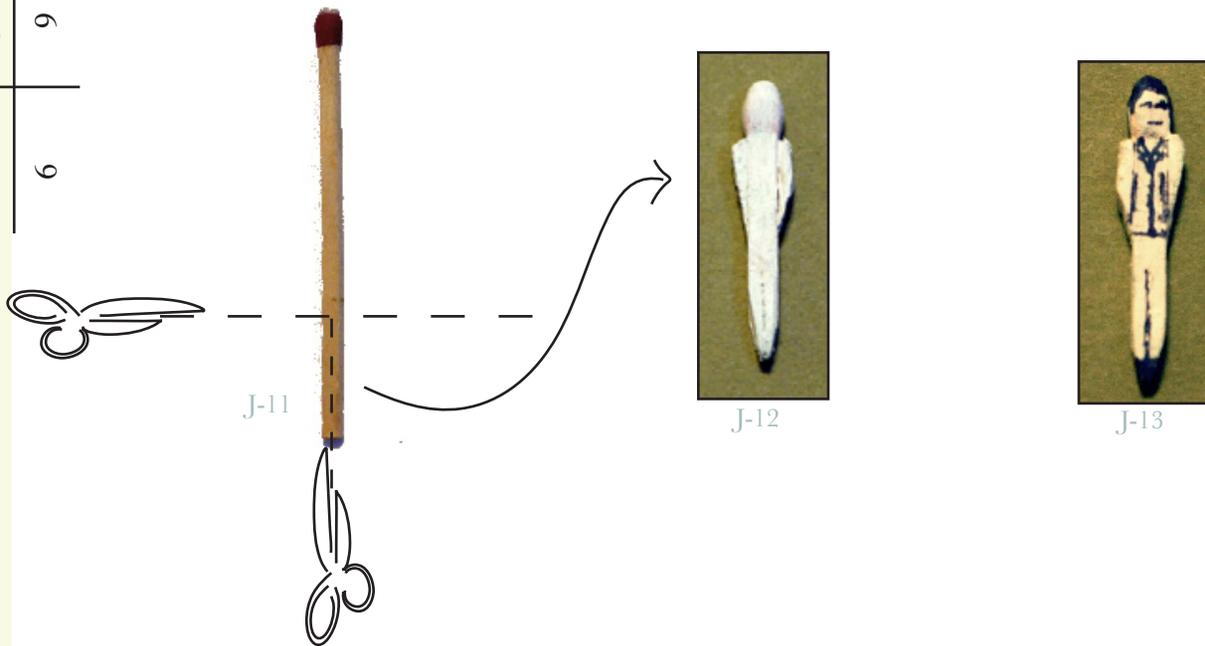
Aesthetics	Cost	Easiness	Time	Rating
7	9	9	9	8.5

PEOPLE

MATCHSTICK

Rating	7.5
Time	8
Easiness	7
Cost	9
Aesthetics	6

Matches can also form figures by simply cutting enough off the bottom tip to get the right figure size (fig. J-11). The discarded end can then be split in half to form arms. You can carve off a bit off the arms to create a more tapered look (fig. J-12). Then glue the arms in place. Spray paint the figure white and if you would like, details such as a face or clothes can be added on (fig. J-13).



FEATURES

CLAY

Modeling clay is an easy material to work with to build small features such as water fountains, cars, planter boxes, stepping stones and boulders. Here, I am using clay that air-dries, but the variety that bakes work just as well. You can easily pop them in your toaster oven for a few minutes and they'll be ready. Acrylic paint will finish them off.



J-14

Painted water fountain and car



J-15

Planter box, rocks and water fountain

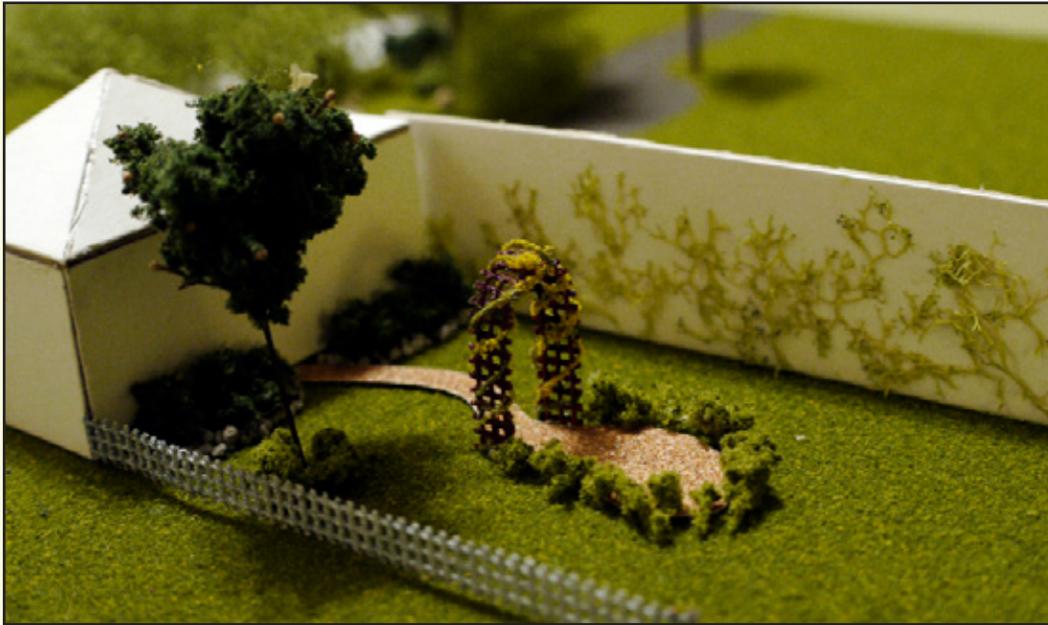


J-16

Planter box and rocks painted with acrylic and added turf

Aesthetics	Cost	Business	Time	Rating
10	7	8	7	8

FEATURES



J-17

Screen as arbor and fence with twisted poly fiber
Lichen on walls as climbing vines

Screens can be cut to form fences, railroad tracks, arbors, and more.

Experiment with common household items, pin needles can become lamp posts, hot glue can be pulled into wisps to form jets of water, and house caulk can be used to add bark texture to trees.

Lichen pulled apart and spread thin can resemble climbing vines on walls. Another alternative, as shown on the arbor, is to pull poly fiber into thin strands and twist into shape. This can be wrapped around trellises, lamp posts, and fences.



J-18

Screen as railroad tracks

The industry is always changing with new methods, materials, and ideas. In spite of this, models are here to stay. As a form of representation, generator of ideas, and means of communication, models will always be useful tools for landscape architects. I hope this guide has given you some suggestions; but more importantly, inspire your interest in this art form. Get yourself lost in building the design and its details and you will discover the joy of past days of dollhouses and miniature G.I. Joes.

MATRIX

	Study model	Virtual Study model	Presentation model	Virtual Presentation model
Intention	Generate ideas, solve problems, modify the design, explore different possibilities	Generate ideas, solve problems, modify the design, explore different possibilities	Communicate ideas, sell a concept, open discussions	Communicate ideas, sell a concept
Cost	Very little, should be built with cheap materials	None, the model is constructed virtually	Can range from being affordable to very costly	None, the model is constructed virtually
Time	Relatively quick, but can continually be modified	Fastest method	Usually the longest	Faster than a physical model, but is easy to get caught up in all the details and end up spending more time
Skills	Imagination and desire to experiment	Computer programs, e.g. Sketchup	Crafty, clean, patience	Computer programs, e.g. Sketchup, sitting at the desk for long hours
Materials	Cheap, fast, and easy to work with - balsa wood, paper, etc.	Virtual- any material is possible	Illustration board, foam-board, wood, metal, glass, etc.	Virtual- any material is possible
Advantages	Quick, efficient, more likely to create realistic and possible forms, and relatively easy to modify.	Quick, cheap, ability to come up with more creative/abstract forms, and easy to modify	Captivating, charming, viewable from all angles, physically three-dimensional, stronger presence	Quick, cheap, more details and specifications are visible, easier to make modifications, ability to enter and explore
Disadvantages	Might be difficult for outsiders to comprehend, may not look presentable	Might be difficult for outsiders to comprehend, may not look presentable	Takes up more space, more time involved, harder to convey the minor details, can be difficult to modify, everything can be seen, including the less pleasing views	Stuck behind the computer screen, cannot view the entire model, only two-dimensional, less of an impact than a physical model

RATINGS

SCALE 1(LOWEST) - 10(BEST)

The scale is based on aesthetics, cost of material, level of ease and time spent. Some might have a higher rating overall but it does not necessarily mean it will give the best results. The methods that produce a better product will usually take more time and effort, therefore lowering its score.

Vegetation:

Scouring pad hedges	9.25	pg. 37
Twigs	8.75	pg. 34-35
Wire	8	pg. 26-28
Scouring pad conifers	8	pg. 36
Sponge	7.75	pg. 38
Styrofoam	7.75	pg. 39
Wire abstract	7.5	pg. 29
Loofah	7.25	pg. 38
Paper conifers	7.25	pg. 33
Cork	6.75	pg. 40
Paper tree stands	6.25	pg. 32

Water:

Glue on paper	8.5	pg. 57
Paper	8.5	pg. 56
Plastic sheet	8.25	pg. 57
EZ water	7.5	pg. 58-59
Paint	7.5	pg. 56

People:

Paper	8.5	pg. 63
Wire	7.75	pg. 62
Matchsticks	7.5	pg. 64

Hardscape:

Clay	8	pg. 52
Sandpaper	8.5	pg. 50
Craft paper	8.25	pg. 51

Structures:

Block	8.25	pg. 44
Detailed	8.25	pg. 45
Balsa deck	7.75	pg. 46

RESOURCES & RATINGS

These are some of the stores in the proximity of Davis that carry supplies one can use for model making. Other store you might like to check out, are specialty paper stores, although the prices are usually a little steeper.

These ratings are based on an average of the 1) the selection of materials 2) the price 3) the helpfulness of staff and 4) Distance from Davis.

Selection	Price	Staff	Distance	Rating
6	9	10	9	8.5

Ace Hardware
240 G St
Davis, CA 95616
(530) 758-8000

Friendly and knowledgeable staff with good prices. Come here to find sandpaper, cheaper brushes and

Selection	Price	Staff	Distance	Rating
6	6	8	9	7.25

Ellis Art Supply
2508 J St
Sacramento, CA 95816
(916) 448-2948

A small locale business with an owner that is very helpful. Their art selection is not very big and prices could be better. However, they have an extremely large selection of specialty papers that might be hard to find elsewhere.

Selection	Price	Staff	Distance	Rating
8	8	8	8	8

Michaels
2175 Bronze Star Dr
Woodland, CA
(530) 669-3240

3691 Truxel Rd
Sacramento, CA
(916) 928-9777

1051 Helen Power Dr
Vacaville, CA
(707) 446-1991

This chain store offers consistent prices that are decent. A one stop for art supplies, dried floral and model making materials.

Selection	Price	Staff	Distance	Rating
7	10	N/A	10	9

Outside

You cannot get everything free from just outside your doors, but you can sure get a whole lot. Sand, branches, and dried grass are some of the things readily available for you to use.

RESOURCES & RATINGS

Selection	Price	Staff	Distance	Rating
10	7	9	7	8.25

RC Country Hobby Shop
6011 Folsom Blvd Sacramento, CA 95819
(916)731-5868

The place to go to get your appetite for models fed. This is a large building filled with model supplies, miniature figures, trains and planes. Certain items are cheaper than other places while others items are more expensive.

Selection	Price	Staff	Distance	Rating
6	7	8	9	7.5

The Paint Chip
217 F St
Davis, CA
(530) 753-5093

A small art supply store where you can find paper, paint, clay and such. Pricing is not the best and there are no modeling material.

Selection	Price	Staff	Distance	Rating
9	8	9	7	8.25

Riverside Crafts
5141 Folsom Blvd
Sacramento, CA 95819
(916) 455-3747

This hobby shop is much smaller than RC Country but has all the essentials you would need. Most items here are cheaper as well.

Selection	Price	Staff	Distance	Rating
7	8	8	9	8

UC Davis Bookstore
2828 Cowell Blvd
Davis, CA
(530) 752-9072

The bookstore is actually a great place to find a lot of materials such as clay, loofah, paint, paper, styrofoam, wood and such. It's right on campus and the prices are probably the cheapest you will find around here.

RESOURCES & RATINGS

Selection	Price	Staff	Distance	Rating
7	7	9	7	7.5

University Art
 University Art - Sacramento
 2601 J Street
 Sacramento, CA 95816
 (916) 443-5721 phone

An art store with a larger selection than the bookstore but higher prices. You will find general art supplies here but no modeling material.

Selection	Price	Staff	Distance	Rating
8	8	9	7	8

Utretch
 1612 Howe Ave
 Sacramento, CA 95825
 (916) 641-6400

The pricing at this art store is cheaper than a lot of its competitors and they carry a small amount of modeling material such as vegetation and figures.

Selection	Price	Staff	Distance	Rating
7	10	7	8	8

Walmart
 720 East Main Street Woodland, CA
 (530) 668-1706

235 East Dorset Drive
 Dixon, CA
 (707) 693-6514

3661 Truxel Road
 Sacramento, CA
 (916) 928-9673

Usually this is the cheapest place to find materials. They only have a small art and crafts selection but you can find great deals in sponges, scouring pads, styrofoam, floral wire, dried floral, and more.

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