

# Building Plastic Models From a Kit

Jason Dennis Goltz  
Extension Agent



**NDSU**  
Extension Service  
North Dakota State University

# Welcome to the Art of Building Models

Building a model can be quite challenging, yet after the work is done, it will have been a very rewarding experience. A model can be built with different materials, including plastic, wood and die-cast metal. For the beginner, the plastic kit is the best choice because it requires less skill than other materials.

These types of projects teach attention to detail and, above all, nearly infinite patience.

Depending on the kit, the builder also will learn much about the subject he or she is reproducing.

The models given as examples in this publication are sailing ships.

The builder of one sailing ship model will know all the parts of a rigged ship by the time he or she is finished with the project.

The same can be said for cars, airplanes and other subjects.

## Objectives

- Learn to follow plans and written instructions
- Become familiar with the process of constructing a model
- Learn the subject matter that the model represents
- Develop skills to progress to the next skill level and beyond

## Glue or No Glue

Two different types of plastic models are available. The first is the snap-together model, which doesn't require any glue, or at least minimal amounts. The second is the type in which the majority of the assembly is glued together. The snap-together models usually are suited for very young builders who are not old enough to be able to use glue. Other than the assembly method, the rest of the information is the same for both types.

## Choosing a Model

Choosing a model can be a daunting task. Thousands of kits by many different manufacturers are available. Here are a few factors that have to be considered when choosing a model:

- Size
- Complexity
- Interest in the subject that the model represents
- Cost

Each one of these has relevance in the decision.

The size of the model is important, so first let's understand how models are sized. Most kits give a

ratio; the model on the cover is a 1:96 scale model of the USS Constitution. The first number is always a 1; the lower the second number, the larger the model. A 1:96 model is much larger than a 1:350 model. In addition to the ratio given, the manufacturer will give a relative size of the finished model. Keep in mind how big the model will be when it's finished. A 1:72 scale model of a WW II submarine is 52 inches long. Where would this go once it's done?

The complexity of the project is usually given as a skill level, with one being the lowest and five being the most difficult. Start with the skill level that's appropriate. Building a model that's too complex can be frustrating and then the project is no longer fun. The same can be said for choosing one that's too easy; being bored isn't that much fun, either.

Having an interest in the subject certainly helps in building a good-quality model. The examples given in this publication are ships because the author used to be a sailor. Models are available for any subject, from ships, cars and planes to even anatomy.

Finally, shop around. The larger models will cost more, but keep an eye out for sales. Plan far enough ahead to avoid a last-minute purchase, which is rarely during a sale. Holidays and closing sales can be the best bargains.

**This Soviet Typhoon class submarine was constructed by Yuriy Atanasov of Vratza, Bulgaria.**



# Tools

Choosing the right tools is important. Most kits will list a set of tools and paints that are needed to complete the project. This is only the minimum; other tools can be of great help. Listed below are a few of the tools that can help with the building of the model:

- Tweezers
- Scissors
- Knife
- Sandpaper
- Putty

A pair of tweezers is important, especially for models with very small parts. The long-handled tweezers are much better than the type in a manicure set because they can get into some hard-to-reach places better.

A small pair of scissors is helpful for trimming and small cutting jobs. This tool is usually only relevant to certain models, but it can be good to have in the tool kit for future models.

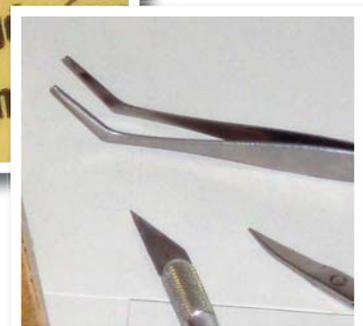
The knife is a special knife just for model building. Disposable knives are available with plastic handles or replaceable blades and aluminum handles, such as the one in the illustration. Ultimately, the knife with the replaceable blades is better and doesn't cost much more. A variety of blades, from pointed

to blunt, can be purchased; their uses can range from fine cutting and trimming to carving. Having some flexibility in choosing the best blade for the job is best. Plastic doesn't always come out of the mold perfectly, and finding that the model might be warped slightly or have had an air bubble when it was being molded is not uncommon. This is why being able to use a blade for carving instead of cutting is important.

Sandpaper also can be of great help in removing burs and smoothing out high spots and imperfections in the plastic. The smaller the grit number, the coarser the sandpaper will be; 100 grit used lightly is just fine. When using the sandpaper, wrap it around something straight, such as a small block of wood. When the sandpaper is used in this way, it won't gouge the surface of the model.

Putty is available specifically for plastic models. The putty is simply used to fill an area that had an air bubble. Then after it's dried, it can be carved and shaped to match the surrounding area. Putty requires a little skill in using it, depending on where the defect is located.

Good-quality tools can lead to a good-quality project.



# Construction

Before beginning the construction of any model, read through the entire instructions and ensure you have a reasonable understanding of them. When working on one step, look ahead at the next step to see how it will build on what you are doing at the present time.

A few items that can be of great help during the construction of your model are:

- Tape
- Rubber bands
- Clothespins

When constructing the model, don't try to do too much at once; work in small steps. Trying to glue too many things at once can cause the parts to shift and the glue can spread to places it doesn't belong, especially on clear plastics that will cloud if the glue touches them.

Prepare the pieces to be glued together by first verifying that they are indeed the right pieces. Next, prepare the area by ensuring that no paint is on them because paint will keep the glue from sticking well. Lightly sanding the area to be glued is advisable if possible because that'll help the glue stick; the glue works by partially dissolving the surface of the two pieces and effectively "welding" them together.

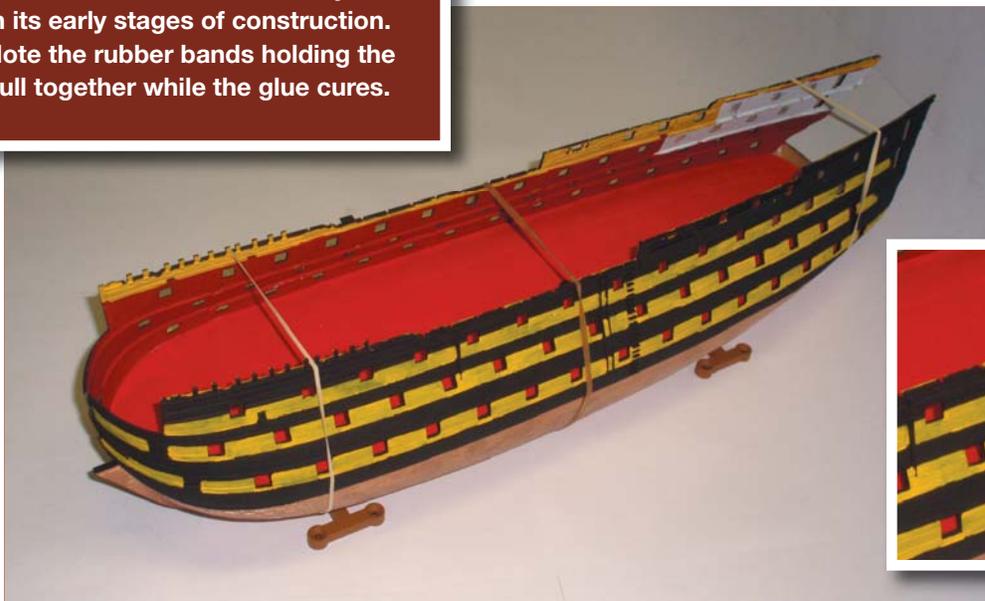
These are useful tools to assemble your model.



The pieces should be held tightly together until the glue dries; this may take a few hours or days, depending on temperature, humidity and the age of the tube of glue. Twenty-four hours should allow the glue to fully cure. To ensure constant pressure on the parts tape, rubber bands or clothespins should be used to assist.

Take care when gluing the parts; a little glue does go a long way. Slowly remove the rubber bands or whatever has been used to clamp the parts together. Some glue may have oozed onto the rubber bands or other clamps and removing them too quickly could cause a setback.

This model of the HMS Victory is in its early stages of construction. Note the rubber bands holding the hull together while the glue cures.



# Painting and Finishing

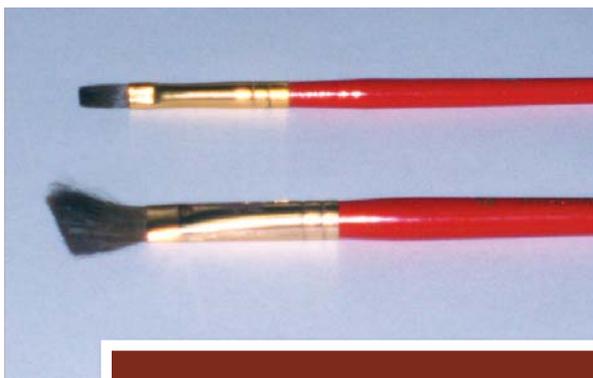
Before beginning a model, decide what type of paint will be used. Paint types are enamel paints, which require a solvent, and acrylic paints. Each one has benefits and drawbacks.

The enamels give a good, durable finish, but require solvents for thinning and cleanup. The acrylic paints, on the other hand, clean up well with water and without the smell, but are less tolerant of poor surface preparation. Either one is acceptable for painting a model, but both should not be used on the same model; pick a type of paint and use only that. Painting a model is a lot simpler when you don't have to keep track of two different types of paint.

Brushes are equally as important as choosing any other tool or the type of paint. Plastic disposable brushes are available, but they really do not give a good finish. A set of natural bristle artist brushes is an excellent choice and will serve your purposes for many projects in the future. This assumes, of course, that you take care of them properly.

Always keep the brushes clean and never dunk the whole brush into the jar of water or cleaner. Paint all the way up the bristles makes them harder to clean and can shorten their life. When the brushes are not being used, coat them lightly with petroleum jelly to keep the bristles from drying out and fraying; make sure to clean the brush thoroughly before use.

When beginning the project, pre-painting some of the parts and letting them dry is a good idea; these



The top brush has been maintained carefully. The bottom one wasn't so fortunate.



Different paints are available to the builder. Notice the bottle with M3 on the lid. This was mixed using instructions from the HMS Victory model.

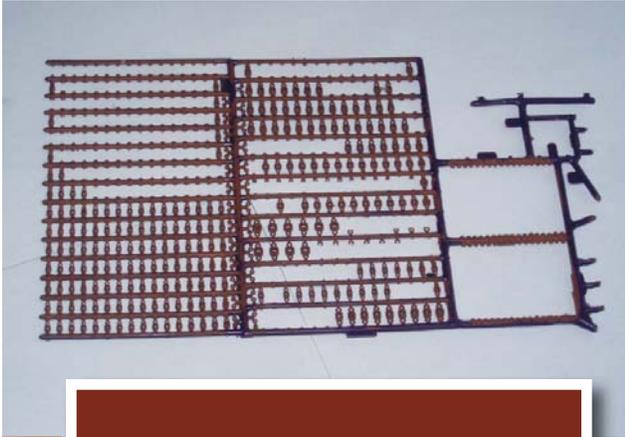
parts can be touched up after assembly. Pre-painting also will give you a head start on the construction.

Most kits come molded in the main colors of the finished model; an example would be the kit on the cover. This model was molded in black, brown, tan and white. This makes painting a lot easier, but models still need a coat of paint. Large areas can be sprayed or brushed, but if brushing is the method chosen, then think about how much paint is going to be used.

Paint is made in batches and not every batch comes out exactly like the preceding one. Buy glass paint bottles at the hobby store; they're available in different sizes and you can use them to mix multiple smaller bottles of paint together. That way, you will have enough paint to do the model and it will all be the same shade of color.

Some manufacturers will give instructions on mixing certain colors. Having bottles in which to mix the specific shade is necessary. Use a code or mark the bottles in some way to keep track of them.

Taking your time when painting the parts is important. All the preparation work can be for nothing if you don't give the model a good-quality paint job. Parts should be painted separately and then assembled.

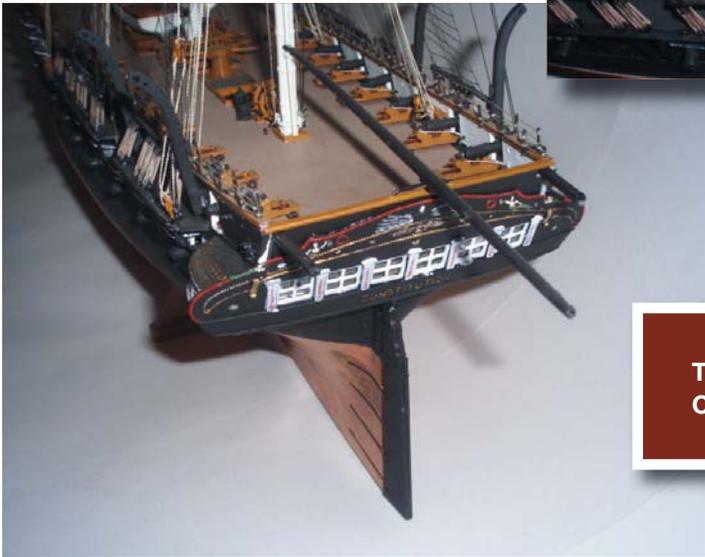


**These tiny parts were painted before separating from the sprue.**

**The deck of the USS Constitution shows details even below the deck.**

Scrape the paint from the joint before gluing or the bond will be weak. Parts must have a plastic-to-plastic union for the glue to work properly. The joint always can be touched up after assembly.

To do delicate detail work, such as the stern of the ship illustrated, some work is involved. Paint the base coat and then tackle the details. Thin the paint so that it doesn't fill in any of the small areas. More coats will be required, but the effort will be worthwhile. Another technique for detail work is not to use a brush but a toothpick. The flat toothpicks work the best. Just dip a toothpick into the paint and trace it onto the surface. Be careful that the paint doesn't form a large drop and spoil your work. This can be the most time-consuming effort next to tying the rigging on a ship.



**This is the stern of the USS Constitution.**

# Make it Yours

You have two ways to go when building a model. The first is to build by following the instructions exactly; the model will come out looking perfect, although a little too perfect, actually. Nothing is wrong with that if your intention is to provide a detailed model of what the object should look like. Engineers and architects do this all the time.

The other way is to make it more realistic, as though you are looking at it in real life. We all know that nothing stays perfect very long if it is being used out in the weather. This is especially true if your model is of any type of vehicle, which is a perfect example.

When a vehicle rolls off the assembly line, it's as perfect as it can get, which is what the instructions in the model kit are trying to achieve. After use, it develops a little character.

Parts are different shades or even different colors all together after they have had to be changed and, of course, things can get a little rusty. Rust can be simulated with mixing your own shade of paint and putting a little on your brush and then blotting it dry. The brush should just be damp with the paint. Then streak it onto the model the way natural rust would look. Damage on the vehicle can be simulated with black and dark grey for a shadow effect.

Sometimes we want to make a certain replica, such as with fighter jets or bombers. The same can be said for race cars. The model manufacturer cannot have all the decals for every fighter ever made. You may have to make your own. This is simply up to your imagination and a computer. Search for pictures and use a special decal paper for your printer. Some paper will come in a standard 8 1/2 -inch by 11-inch sheet and others will come in smaller sizes. This is a good way to make your own water slide decals for a certain model that you want to build.

Another way to make the model your own is to customize the display a little. Let's take the ship for example. Sailing ships usually were made with oak hulls, teak decks and pine or fir masts. Find a piece of one of the types of wood the ship was made from and make a simple plinth from it; this will dress up the ship quite a lot.

Display cases are also a good way to personalize your project. Some models, such as the ships pictured, can take up to a year to construct and cost quite a lot of money. Placing them in a case to keep the dust off and protect them from damage would be prudent.

Display cases can be customized just as the ship plinth was. The materials and the finish can reflect what is being displayed. If a car is displayed, the base could be painted black with street lines added. The possibilities are only limited by you.

Some techniques, such as simulating the cannon being fired, can put the ship into motion. Heat a needle in a candle and push it into the muzzle of the cannon; this will create a hole easily. The next step is to insert a wire into the hole and use an epoxy to glue it into place. Then glue some cotton to the wire to simulate the smoke cloud from a cannon being fired.

Each different model, no matter what the subject, can be personalized in this way. Keep in mind that a little can go a long way and not to overdo it; otherwise, the model can become a little too "busy."



**Good luck and  
may you have  
fair winds and  
following seas.**

The NDSU Extension Service does not endorse commercial products or companies even though reference may be made to tradenames, trademarks or service names.

This publication may be copied for noncommercial, educational purposes in its entirety with no changes. Requests to use any portion of the document (including text, graphics or photos) should be sent to [NDSU.permission@ndsu.edu](mailto:NDSU.permission@ndsu.edu). Include exactly what is requested for use and how it will be used.

County commissions, North Dakota State University and U.S. Department of Agriculture cooperating. North Dakota State University does not discriminate on the basis of race, color, national origin, religion, sex, disability, age, Vietnam Era Veterans status, sexual orientation, marital status, or public assistance status. Direct inquiries to the Chief Diversity Officer, 205 Old Main, (701) 231-7708. This publication will be made available in alternative formats for people with disabilities upon request, (701) 231-7881.