

THE BASICS OF PAPER MODELING: TOOLS AND EQUIPMENT

GLUE



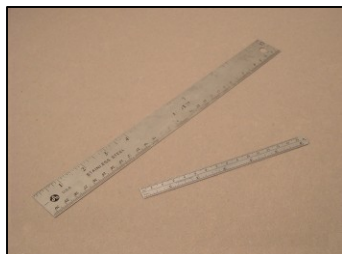
There are a variety of glues and adhesives on the market, some of which are nicely suited to building paper models. White glue (also known as PVA glue), glue sticks, Uhu office pens, tacky craft glue, and sometimes even superglue (cyanoacrylate adhesives) all have their own uses. For the great majority of the time, however, you can get by just fine with white glue alone.

SCORING AND CUTTING TOOLS



You'll want to have, at the very least, a sharp hobby knife for cutting parts out of the printed sheet. Scissors are not recommended. For scoring, you can either gently drag the hobby knife across the fold (not recommended), or use specialty tools for scoring without cutting into the paper. Embossing tools such as the ball stylus, an empty ballpoint pen, a scrapbooking bone folder, or even secondhand sculpting tools with smooth and dull blades are great tools for scoring without breaking the paper.

STEEL RULERS



To precisely guide your cuts or scoring, steel rulers come in very handy. Unlike plastic or wood rulers, steel rulers are resistant to sharp hobby knives. You can get by with just a normal 12-inch steel ruler, but you may find that a smaller 6-inch steel ruler is a lot handier and easier to deal with when making small cuts. Along larger parts, steel rulers can also be used as a bending brake.

HOBBY TWEEZERS



Sometimes you'll encounter folds that seem too small to do with your fingers alone. In this situation, a pair of hobby tweezers like the one shown to the left is very handy. In effect, they act as a set of tiny fingers and a miniature bending brake, allowing you to crisply fold very small parts.

BLACK, GRAY, OR DARK GRAY MARKERS



When you cut parts out of the sheet, the edges are naked white. This generally results in a less than pleasing visual effect when the model is fully built, and this is dealt with by a technique called "edging". When edging parts, you will be doing two things: coloring the actual edge itself, and coloring in a portion of the glue tabs. The best marker to use for edging is one that has a soft chisel tip, and which doesn't bleed through thin cardstock. The markers pictured to the left are calligraphy markers with 2mm and 3.5mm chisel tips.

CUTTING PAD/MAT



A good self-healing cutting mat will help your hobby knife blades stay sharp longer, and protect your work surface from damage.

THE BASICS OF PAPER MODELING: TIPS AND TECHNIQUES

Basic Techniques

- 1. Scoring:** Scoring is a technique used to make folding easier by pre-creasing the paper along a fold line. The most common method of scoring is to lightly drag a knife blade across the fold line, slicing through the upper layers of the paper. The recommended method is to instead use an empty ballpoint pen or a ball stylus tool to gently compress the paper along the fold lines. This prevents the appearance of unsightly naked edges and makes for a much stronger model.
- 2. Cutting:** Cutting may seem to be a glaringly obvious technique, but a few pointers are essential. For the majority of cutting where paper models are concerned, a sharp knife and a steel ruler are far more precise and efficient than a pair of scissors. Save the scissors for separating individual parts or groups of parts from the rest of the sheet.
- 3. Burnishing:** Often, you will be building parts that are composed of flat fold-overs. In order to ensure that they stay straight and do not delaminate after building, you will want to burnish the two halves together. You can use your finger, a smooth and flat tool, or even a little rolling pin. Burnishing forces the two layers in a flat fold-over together, spreading out the glue even further and squeezing it into the paper fibers for additional bite.
- 4. Edging:** Edging improves the appearance of paper models considerably by hiding the naked edges of cut parts. Anything from color markers to soft pencils and various types of paints may be used to edge parts. However, in most cases, matching the color exactly is less of a concern than simply matching the contrast. For most purposes, three or four shades of gray from lightest to darkest will more than suffice.
- 5. Backcoloring:** For parts that are open volumes, which expose the unprinted side after assembly, you may want to use backcoloring to cover the unprinted side. Backcoloring is similar to edging, except the entire unprinted side of a part is colored in the desired edging color after cutting out and before assembly. Backcoloring is effective at making open parts appear solid. Backcoloring is also very useful for masking alignment errors when cutting out flat fold-over parts.
- 6. Folding and Gluing:** Depending on the thickness of the paper or cardstock used, some parts may be difficult to assemble with fingers alone. In this situation, a pair of tweezers is worth more than its weight in gold. Tweezers come in a wide variety of sizes and jaw shapes, and some of the more exotic shapes are fantastically useful for assembling tiny parts. Tweezers can be used to fold tiny flaps and clamp them in place while the glue sets, as well as making it much easier to attach small parts to other parts.

Special Notes

- 1. Gluing Tabs:** This model includes integral gluing tabs for joining certain parts together. However, the utility of gluing tabs decreases proportionally as the thickness of the paper or cardstock increases. Thick cardstock or paper can be used for printing this model, but it is recommended that you try a test assembly before committing wholly to assembling a model. If the gluing tabs won't fit or otherwise throw off the tolerances of the finished test assembly, leave them off the parts entirely and cut your own gluing tabs out of scrap cardstock.

These separate gluing tabs should overlap both of the parts to be joined, and glued to the unprinted surface along the joining edges of both parts. This is called "backing", and a side effect of this is that parts will fit more or less flush. Backing parts with separate gluing tabs also generally yields better modeling results, but the integral gluing tabs are retained for the convenience of beginners and those who prefer to use thinner media for their paper models.

- 2. Sealing:** In most cases, sealing the model with varnish or other form of spray sealant isn't necessary. However, if you want to add further detail to the model with decals or paint, you may want to seal the model with several light coats of a waterproof glossy clear sealant first. This will protect the model from a moderate level of moisture, and the smooth surface will facilitate the application of decals. You can also apply a final coat of a matte clear sealant to kill the gloss afterwards. Keep in mind that the simple act of sealing a model does not necessarily render it waterproof, and that any application of waterslide decals needs to be done with great care.
- 3. Reinforcing:** At times you may need to reinforce large pieces, either to make them heavier or to increase their strength. To do this, you may wish to glue toothpicks, craft sticks, or other suitable items to the interior of a model.
- 4. Weighting:** If you find that your models are too light, you can weigh them down by gluing various ballast items to the inside of the model. Some items that come to mind include pennies, ball bearings, and washers. Affixing these items to the unprinted side of a model before folding and gluing it into shape will give the model a significant amount of heft and weight.

IMPORTANT ASSEMBLY TIPS AND NOTES

When building models of this size, there are some important tips that we strongly recommend that you follow, in order to achieve the best possible results for your efforts.

Use Tweezers For Small Folds

For best results, use tweezers as a bending brake when dealing with small folds and tabs. Tweezers have the effect of acting as tiny fingers, and make the process of building small parts much easier. Tweezers are also excellent clamps, and allow you to hold tabs in place tightly until the glue sets.

Don't Score, Crease Instead

This model uses much more subtle fold lines that are a darker shade of whatever the underlying texture color is. The purpose of these subdued fold lines is to be much less obvious at the typical viewing distance of 2 feet or greater. This helps present a cleaner, more realistic appearance. The subtlety will be lost completely if these lines are scored, because exposed white cardstock or harsh edging will ruin the effect. Additionally, the very close spacing of some folds at this size means that scoring will actually greatly weaken the model and obliterate a lot of visual detail.

As a nice side effect, creasing eliminates the need to edge each and every fold line, and saves time in the end.

Backcolor Foldover Parts

Some parts of this model are simple 2-ply foldovers. In order to hide any alignment problems when cutting out these foldover parts, you may want to backcolor the part before folding it over on itself. This way, you will eliminate the majority of obvious whitespace peeking out from misaligned cuts or folds.

Edge Before Assembling

The best time to edge your parts is immediately after cutting them out and creasing them, and before gluing them together. This way, you will be able to better control where your edging marker goes, and you will not need to worry about hard-to-reach areas.

Don't Sweat The Small Cuts

Small parts mean much shorter cuts, and using a steel ruler to align your cuts is usually not necessary for most small parts, because the cut lengths are short enough that freehand cuts are easier to do. Many parts of this model lend themselves well to freehand cuts due to their lack of long, straight lines. The trick is to take your time and follow the contour of the cut lines. With a small amount of practice, you would be surprised at how accurately you can freehand small cuts.

The same principle applies to creasing, since many of the fold lines are also short enough to easily freehand.