

Model Design & Building Merit Badge

Finishes

## Why Finishes?



Finishes are used to enhance the appearance of the model you are building.

In this picture, you can see the difference between the model before and after finishing.

Color adds depth and helps give your model your personal touch.

## Why Finishes?



Finishes can be as simple or as complex as you desire.

Any method you chose is acceptable for your merit badge as long as you can explain what you did.



The goal is to introduce you to ways to put finishes on some of the simpler materials.

## Materials You Might Use For Your Model:



Over the years, we have found Scouts to chose different materials for their projects.

Some used wood (such as balsa wood), some 2 liter bottle plastic, cardboard, plastic models, Styrofoam, toilet paper rolls, tape, paperplates, aluminum foil, etc.

You are only limited to your imagination as to what materials you can choose.

We are covering a few of those materials. 4

## Finishing Materials:

For this merit badge we are focusing on two types of coatings:

- (1) water based – that is the paint pigment is suspended in water. Water based paints are usually called Acrylic or Latex paints. Their label will state “Soap and water cleanup”
- (2) solvent based - the paint pigment is suspended in a solvent such as toluene. Solvent based paints are often called Enamel paint. Their label will state “Solvent, mineral spirits or turpentine clean-up”

NOTE: You don't need to go out and buy special paint, you can use what you may have around the house.



## Finishing Materials:

Whether you use water-based paint or solvent based paint, the chemistry is the same. The carrier (water or solvent) evaporates and leaves a binder & pigment. The binder is what holds the pigment to the surface.

Paint is just a combination of pigment and binder.

It's important to choose the right paint for the surface you are painting!

**PIGMENT + BINDER = PAINT**



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## Finishing Materials:

The most common method of applying a paint is a brush. The figure below shows the different types of brushes that are available.



BRUSH SHAPES AND PURPOSES

## Finishing Materials:

Another common method of applying a paint by spraying. The two most popular are spray painting using a can and spray painting using a spray gun.

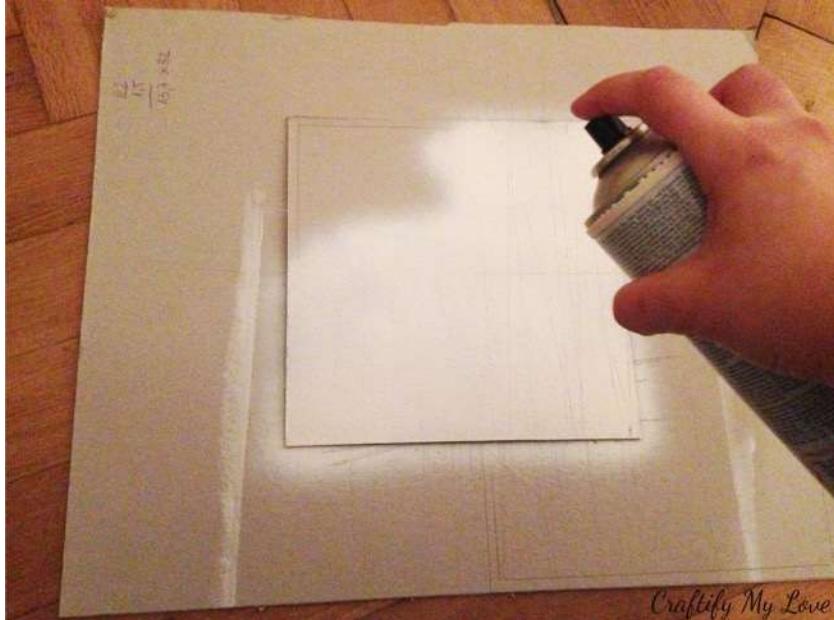
It is **VERY IMPORTANT** when spray painting to do so in a well-ventilated area. Both the paint and the propelling chemicals are harmful if you breathe them. Use spray paint outdoors or in an area with good ventilating air flow. Wear a mask and eye protection.



## Cardboard

Cardboard is a great material to use for building your models. But cardboard soaks up liquids such as glue or paint and the finish won't look good.

To paint cardboard and have the paint look good, you need to apply a primer to the surface. A water-based paint works great as a primer. Maybe you have some left over water based white paint which you can apply. Another way to seal the surface is to spread white glue (like Elmers) over the surface and let it dry. That will seal the cardboard. The primer works great when using adhesives or tape.



For example, you can use spray paint to apply primer.

You can also brush on the paint you are using as a primer.

## Plastic

Many Scouts use plastic (such as a 2 liter bottle) as material for their models. This is a great choice of material as it is readily available.

The best paint to use on any type of plastic is water-based acrylic latex (You can try to use solvent based paint but the solvent might melt your plastic, especially Styrofoam).

You can apply paint either by brushing or by spraying. Either method works.

The trick is to make sure the surface of the plastic is clean. To do that, wash the surface with dish detergent and rinse thoroughly. Dry using a towel. Do not dry using paper towels as the paper towel can leave behind a chemical and prevent the paint from sticking to the surface.



Paint sticks best when it is applied in multiple thin coats.



## Wood (all types)

Wood is a great material to use to build models. Wood can be sanded, cut, shaped, etc. Wood allows you to use mechanical fasteners (such as wood screws) as well as glue. There are many different wood types: low density (balsa), medium density (pine) and high density (mahogany).

The type of painting you do depends upon the density. Low density woods will soak up paint just like cardboard. So you should apply a primer or sealer to the surface before applying your paint. That will keep the final coat from soaking into the wood and giving you a poor finish. You can also apply white glue to balsa wood as a primer.



Medium density woods like pine don't have the same issue so you can just apply two coats of your paint to the surface.

Remember that all woods should be sanded and the wood dust removed before any type of paint is applied!

# Finishes - Summary

- Read the paint labels before using so you know how to thin your paint and how to clean up.
- Clean your model before painting
- Paint in an area that is not dusty
- Test paint on similar material before painting your model
- Use solvent based paints only in a well-ventilated area
- Spray paint outdoors or in a room with flowing air ventilation
- Wear mouth, nose and eye protection when spray painting
- Let the paint dry before touching. Resist the temptation!
- Multiple thin coats will produce a better paint finish than one heavy coat
  - Let each coat dry thoroughly (at least overnight) before applying the next coat