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## Home-Made Pastels for Street Painting

Pastel chalks are one of the most rewarding of artists' materials to make. Because of the huge variety of possible hues and shades and because of their fragility, pastel chalks are difficult to market. The cost of pastels at an art store reflects the inconvenience of marketing them rather than the value of their ingredients. The artist who chooses to make pastels is rewarded with a significant savings, as well as, an improved and personalized palette.

Pastel chalks are simply pigment mixed with a binder and worked into a dough-like consistency. The dough is shaped into the desired form, rolled back and forth on a sheet of paper and left to dry. Care in the selection of the best pigments and binders and testing of the different combinations will produce superior chalks.

Almost all pastels are 90-98 percent pigment so the selection of pigments is the most important factor in making pastels. Pigments must be permanent, opaque, non-poisonous and not have eccentric properties that will prevent them from producing a usable product.

The following pigments are recommended:

White	O	- Titanium dioxide
Black	O	- Mars Black
Red	O	- ferrous oxide reds (red iron oxide, burnt sienna, Venetian red, pozzuoli red)
	O	- Cadmium red (light, medium, dark)
	O	- Alizarin crimson*
Blue		- Cerulean blue
	O	- Phthalocyanine blue
		- Ultramarine blue*
Yellow		-Yellow Ochre
	O	- Transparent gold ochre
		- Mars yellow
	O	- Cadmium yellow (lemon, light, medium dark)
Orange		- Cadmium orange
Green		-Phthalocyanine green
		-Chromium green oxide*
		-Green Earth*
Violet		- Mars violet

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Earth colors      - Burnt umber\*  
O                    - Burnt sienna  
O                    - Brown iron oxide

O – minimum palette of 10 pigments

\* - color may have eccentric properties esp. cementing properties

After the selection of the pigments is the selection of the binder. The most famous and best quality binder is gum tragacanth. This is unfortunately difficult to find and can be expensive. One popular substitute is cellulose glue and methyl cellulose (sometimes bought as wallpaper paste.) Another similar binder is wheat starch. Common to all of these binders is the production of a heavy mucous substance with a very low binding power. Other traditional artists' glues such as rabbit skin, gelatin, egg yolk, and even white glue can and have been used, but are more difficult to manipulate and sometimes yield irregular results, such as, forming a crust on the outside of the pastel.

Of the recommended glues, only the wheat starch comes in a consistent form. It can be mixed 1/8 cup to 2 cups water. Gum tragacanth may come as a powder or in ribbons or flakes and requires soaking and gentle heating (not boiling) to prepare it. With cellulose glue the instructions on the box should be followed for its preparation.

After the glue is prepared, three mixtures are made: full strength, half strength, and quarter strength. The glue is tested by mixing the half strength solution with titanium dioxide which is probably the most consistent of the pigments. When the glue produces the right hardness of white chalk, it is the proper solution. This solution is then used to make test chalks with every pigment, and a record is kept of their relative hardness/softness.

The properties of pigments vary not only from color to color, but from maker to maker and sometimes from batch to batch. Some pigments have natural cementing properties and will create a rock-hard pastel even when formed using only water. Other pigments are so light they produce light crumbly and powdery pastels even with a very strong glue mixture. These pastels tend not to rub off and attach to the drawing surface, but remain a dusty powder. For these pigments the use of an inert pigment or a pastel conditioner is necessary.

Commercial pastels contain a large amount of inert pigment. The name "chalk" comes from precipitated chalk which is an inert pigment. Better inert pigments for pastels are powdered quartz or marble (silica) as they have less tinting strength. Pastels made with neutral pigment will tend to sink when fixed, whereas, pastels made with 100 percent pigment will not. Alizarin crimson and pthalo blue generally need to be used with other pigments or with neutral pigments because of their exaggerated tincture strength.

Aside from the hardness or softness of a pastel, the major distinguishing feature of pastel chalks is their dryness or waxiness. Some pastels are dry like chalks, whereas others approach crayons having a more waxy consistency. Some colors such as titanium dioxide are naturally very waxy and others, like burnt umber are naturally very dry and chalky. By the use of a wax/oil emulsion, the artist can balance the different properties of pigments and produce a set of pastels that conform to his/her personal taste and artistic needs. Wax soap contains oils, fat and alkali in small amounts. Artists concerned about the permanence of their work should use pigments and painting grounds that are insensitive to these materials. (All pigments listed are insensitive except alizarin crimson and pthalo blue.)

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The following recipe has a very high beeswax content and low alkali content:

¼ cup	boiled linseed oil
¾ cup (liquid measure)	beeswax
5 oz. (1/2 cup)	ivory bar soap
2 ½ cups	water
	wall paper paste solution (follow directions on package) wheat paste
	electric skillet and microwave oven

1. Melt the piece of beeswax in a microwave oven if available. Otherwise, heat the beeswax in the electric skillet until liquid. Measure ¾ cup of the liquid beeswax and combine with ¼ cup linseed oil. Remove excess beeswax from the skillet. Return the beeswax/oil solution to the electric skillet and heat to 350 degrees.
2. Grate Ivory bar soap and place in a pan with 2 cups water. Over medium high heat, bring to a rapid boil and stir with a French whisk until dissolved.
3. Pour boiling soap solution extremely slowly into 350 degree wax solution, beating rapidly with the French whisk until well combined. Add ½ cup of boiling water to the emulsion whipping it constantly until well combined.
4. Pour emulsion into metal pan and place into ice water bath still stirring constantly. Stir until room temperature. The emulsion should be smooth and free of grains. The consistency should be like a heavy cream. You can add more or less boiling water in Step #3 to adjust the consistency.
5. Mix wall paper paste solution and combine an equal part of beeswax/oil solution to an equal part of wall paper paste solution for a waxier chalk.\* One part emulsion to 2 parts wall paper paste solution creates a normal chalk. Stir with French whisk until combined.

\*Best for street painting!

Different combinations of the emulsion and glue mixtures can make almost any pigment usable. The pigments that weigh less generally need more emulsion to make chinks that match the more waxy colors such as titanium and cadmium produce. One part emulsion to 2 parts wall paper paste glue solution creates a normal chalk. A half and half mixture makes a waxier one.

As stated previously, every pigment will need a different proportion of binder. An experimental chalk must be made from every pigment to determine its properties. Once the binders are added to the pigment, they are first mixed with a spatula or plastic spoon. More pigment is added until a dough is formed.

Care on forming the pastels will yield a better product. Pastels should be formed between the fingers to their appropriate shape, and only rolled back and forth in one or two passes to round them. Rolling the pastels too much will make the glue leach out to the outside, forming a shell or crust, which is undesirable.

For creating tints of color, precipitated white chalk may be used (as in commercial pastels.) This is easier to handle than the titanium white and less expensive, but will sink when fixed. For the artist wishing the stronger white tints and not wanting to be involved in complicated procedures, pure titanium white pigment may be tinted with tube watercolors, adding a half strength glue mixture as needed. For school use, chinks can be created with white clay, and tempera colors experimenting with different combinations.

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