Testing….Testing….

Making accurate glaze tests is a good investment of time. You learn how materials work, and have a visual record for future use.
I cannot stress strongly enough the need to document EVERYTHING you do. Record your information in your log book. Label your test tiles with an iron oxide stain. I cannot help you if you get spectacular results, but can't remember what you did.

Test Tiles

There are many ways to make test tile:

1. thrown rings with a flange, cut into sections (these take up more room for storage or mounting, but are self-standing in the kiln),
2. extruded tiles (a die is made to extrude a tile or self-standing shape),
3. or slab tiles.

Using slip on the test tiles gives you more information than using your clay body alone. Due to the interaction of fluxes and colorants, not all clear glazes, for example, are alike, and using the glaze over a range of slip colors helps you find the best glaze for your use.

Make test tiles NOW for future use!

- It's a good idea to have a stock of bisqued tiles on hand for glaze testing.
- It is helpful to make a hole for mounting/hanging test tiles. Remember, the holes shrink during drying and firing, and if you want to mount these on a nail later, you have to make them bigger than the desired result to allow for shrinkage.
- Make an incised texture to test for glazes that break or pool (A fork is handy for this. Don't use a pin tool: lines are too small.).
- Use iron oxide and water with a small brush to label the tile.

Fire the tiles upright
You will need to know if the glaze pools, striates, mottles, or is runny. Firing the glaze flat will only give you partial information (i.e. what the glaze looks like on flat tiles, not on vertical surfaces).

How to: Line blends, Biaxial blends, Triaxial blends

Line blends
A line blend is where we blend two glazes together in various proportions resulting in a series of glazes of intermediate composition. You can also use a blend to study the effects of varying the composition of material in your glaze recipe. This technique can be used to explore existing glazes you have, or to develop color blends, to see the effect of increasing a particular ingredient on a glaze, or even blending stoneware and earthenware glazes to develop midfire glazes.

Quick and Dirty Tests:

To quickly add to your existing glaze palette when you already have a stable of glazes mixed:

1. Select 2 glazes to use. I recommend you use 2 fairly dissimilar glazes, i.e., one translucent and one opaque; one shiny, one matt; one yellow, one blue.
2. Mix the glazes volumetrically. A very simple 1st test would use 5 test tiles:

TT1 100% Glaze A	TT2 75% Glaze A 25% Glaze B	TT3 50% Glaze A 50% Glaze B	TT4 25% Glaze A 75% Glaze B	TT5 100% Glaze B

3. Use a consistent volume measurement (I use a ¼ C measure or a graduated cylinder which measures liquid in CCs) You could also use a volumetric syringe.

Here's an example of a 7 tile line blend:

TT1 100% Glaze A 0% Glaze B	TT2 83.3%A 16.7%B	TT3 66.7%A 33.3%B	TT4 50%A 50%B	TT5 66.7%A 33.3%B	TT6 16.7%A 83.3%B	TT7 0%A 100%B
60 ml glaze A	50 ml A + 10 ml B	40 ml A + 20 ml B	30 ml A + 30 ml B	20 ml A + 40 ml B	10 ml A + 50 ml B	60 ml glaze B

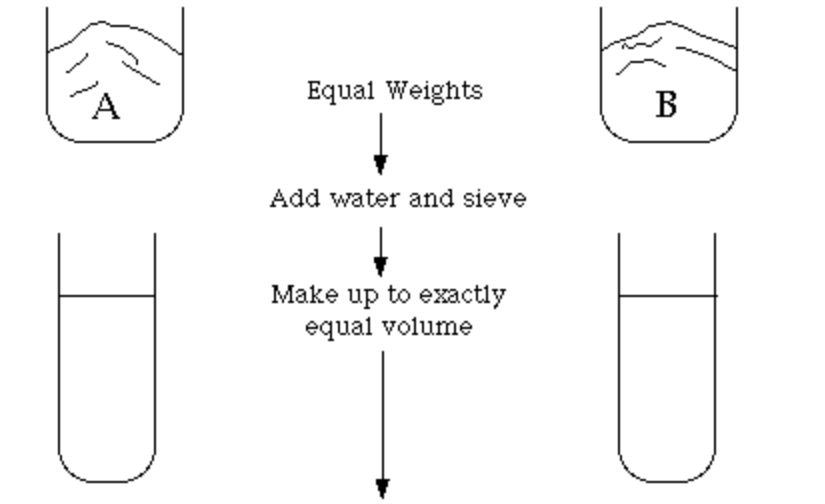
Mix the glazes thoroughly, then dip the test tile into each sample. Make sure your test tiles are labeled and you have a good record of what you are doing.

Future Glaze Recipes:

Okay, so you found a blend combination that you LOVE, and want to make a large batch by itself. In order to do this accurately, you must follow a simple rule so you can work out the dry batch recipes of the intermediate glazes. Instead of starting out with your glazes already mixed, you need to weigh out the same amount of each of the two blending glazes, and make them up with water to exactly the same volume. Once you've done this, it's easy to work out the recipes of intermediate (blended) glazes.

The line blend is a useful experimental tool for the potter. It allows one to fine tune glaze composition, and by careful choice of the two blending glazes, one can isolate a single variable and discover the role of that variable in the glaze being studied. Volumetric blending is often used in glaze experiments because it enables lots of related glazes to be prepared in a short time.

Preparing a Line Blend by Volumetric Blending



Blend into 5 cups to produce the line blend using the table below.

The following example shows the relationship between the blending process and the recipes of the blends:

	Glaze:	1	2	3	4	5
Blend the two glazes in these proportions	Parts of A	4	3	2	1	0
	Parts of B	0	1	2	3	4
(by volume) to give these recipes	Feldspar	60	55	50	45	40
	Whiting	40	35	30	25	20
	Kaolin	0	10	20	30	40
		A				B

Note the simplicity of the mathematics: the equal steps in the blending process (4 parts, 3 parts, 2 etc.) resulting in equal steps in the recipes (e.g. Feldspar: 60, 55, 50 etc.)

Biaxial blends

Biaxial or Quadraxial blends are used when you may want to explore:

- Changes involving two materials in a recipe e.g. if in the Glaze recipe you wanted to explore the effects resulting from changes to both EPK Kaolin and Silica.
- Changes involving four materials in a recipe. This is the most complex of scenarios and perhaps the least used except in the case where the materials are colorants.
- The results of simply blending four different recipes

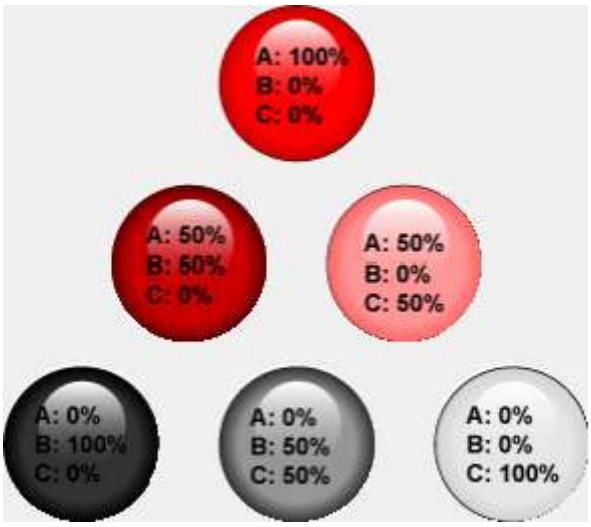
These blends are slightly more complicated, involving the blending of 4 glazes at the corners of a square or rectangular grid. The reasons you would do a biaxial blend would be to get a much more detailed view of a certain glaze with only two variables (i.e. a glaze where alumina and silica levels are varied), or to get a broad range of colors from a couple of additions to a specific base glaze.

Triaxial blends

The idea behind this testing is that you get 21 different variations on 3 base glazes which opens up quite a new world of color development to the ceramic artist. A Triaxial Blend is a group of glazed and fired ceramic tiles that are arranged in a triangle. The tiles show the effect of combining different percentages of three different glazes.

Example of a 6 tile Triaxial Blend

This example of a Triaxial Blend will show the effects of combining Glaze A, Glaze B and Glaze C on 6 test tiles.
The final Triaxial Blend will be displayed in the following pattern:



This is the diagram of the final glaze combinations:

The tiles on the points of the triangle will show the full glazes.
The top point (position 1) will be glazed with 100% of Glaze A.
The left point (position 4) will be glazed with 100% of Glaze B.
The right point (position 6) will be glazed with 100% of Glaze C.
The tiles in between will be mixtures

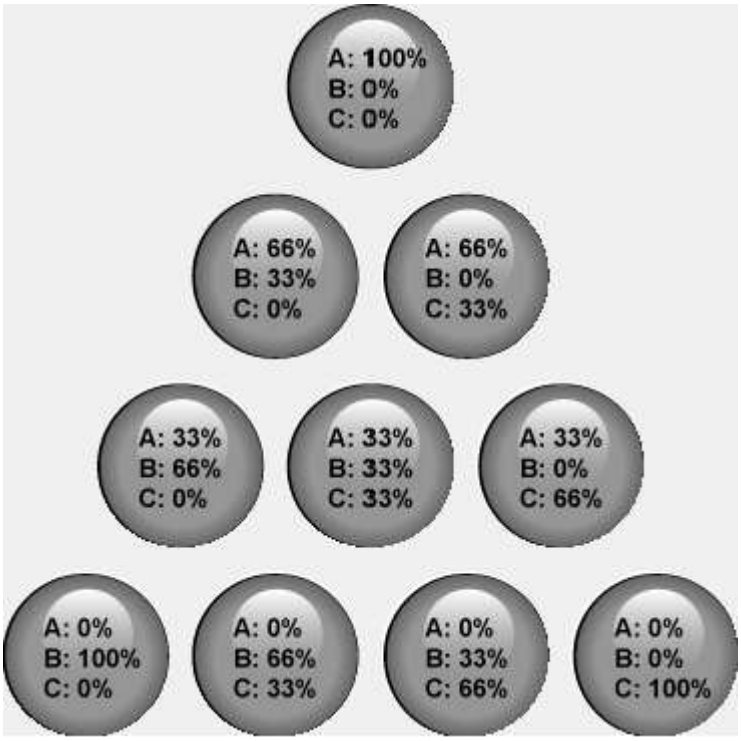
Position 2 will be a combination of Glaze A and Glaze B
Position 3 will be a combination of Glaze A and Glaze C
Position 5 will be a combination of Glaze B and Glaze C

Explanation of a 10 tile Triaxial Blend

The 6 tile Triaxial Blend shows the effect of mixing 50% of each of the three glazes. In this case, you cannot show the effect of mixing all three glazes together. That would be 50% A + 50% B + 50% C making 150%! You only show glazes adding to 100% so this tile would not be shown.

So, to show the effects of mixing all three glazes you need to show the case of 33.3% change (where 33.3 = 100 divided by 3). In this case you could show 33.3% A + 33.3% B + 33.3% C to make 99.9% (from now on we will call 99.9% 100%).

In the 33.3% mix we have the following possible combinations to get 100% glazes



Here is the combination diagram for the 10 Tile, 33.3% Triaxial Blend

Combination 1: 33.3% A + 33.3% A + 33.3% A
Combination 2: 33.3% A + 33.3% A + 33.3% B
Combination 3: 33.3% A + 33.3% A + 33.3% C
Combination 4: 33.3% A + 33.3% B + 33.3% C
Combination 5: 33.3% B + 33.3% B + 33.3% B
Combination 6: 33.3% B + 33.3% B + 33.3% A
Combination 7: 33.3% B + 33.3% B + 33.3% C
Combination 8: 33.3% C + 33.3% C + 33.3% C
Combination 9: 33.3% C + 33.3% C + 33.3% A
Combination 10: 33.3% C + 33.3% C + 33.3% B