Decoding Color

By Robert Fitt

(Rough draft)

Dedicated to my friend, and partner in painting,

Jan Denbutter

With gratitude for the insights of Frank Erickson, a painter and teacher who was a very colorful character in his own right.

The arts are at the heart of living and the soul of learning. Their discipline tames us; their aesthetics civilize us; and their tradition ties us to our cultural roots—giving meaning and stability to our lives. Exposure to the arts unshackles our feelings, liberates our senses, and opens our hearts and minds to the majesty of the universe. *-Robert Fitt -*

WELCOME TO THE WORLD OF BEAUTIFUL COLOR!

Color is exciting. It elicits emotion and heightens our appreciation. While the contrasts between light and dark best describe an image, it is color that brings zest and excitement to the world.

As you picked up this book; Thumbed through it quickly and scanned the fly leaf, you didn't do it by chance, did you? The fact that you did it at all gently exposed a lively, (though perhaps hidden), interest in mixing beautiful color.

COLOR!

It's all around us. Almost everything we see or touch is a manifestation of color, bright or subtle. But while everyone *looks* at color, not many really *see* it; and very few can accurately reproduce a color they see on their pallet. Yet here you are, interrupting whatever else your life demands, hoping to understand color well enough to understand and gain control of the colors around you. It may be that you're a painter, eager to improve your skills as an artist; but it is more likely that you are more interested in color as it relates to your makeup, wardrobe or decorating your homes tastefully.

This small volume will teach you how.

By discovering the concepts and percepts of color mixing, you will learn an organized way to mix beautiful color precisely with a limited palette. The color templates that are provided that will help you to identify numerous colors that fit into organized systems of color—systems that allow a wide variety of color expression without muddying your color. Color harmony is usually defined by using three colors for the bulk of the work. Having chosen a limited palette, as described later, you will enjoy the freedom of mixing any of the chosen colors, in any way you would like, without fear of mixing a color that will not harmonize with the rest.

As a bonus, you will learn how to rescue muddied color when it occurs. You will probably agree that just eliminating the problems created by 'muddied color' is well worth the time and effort to read this book; but there is more...much, much more.

Read on. And may your adventures be colorful!

A vocal student, serious about pursuing her singing career recently dismissed her voice teacher because he insisted that she learn proper breathing technique before she began vocalizing. This shortsighted student failed to realize the singing depends solely upon an adequate air supply. Without air there is no sound. Thus, learning the basics come first.

LET'S BEGIN WITH THE BASICS

Since every discipline has its own vocabulary it may be well, at this point, to define some of the vocabulary words that will become more familiar to you as you read the book. One of the glaring challenges in the art world today is that there is no standardized vocabulary that is in use by all teachers. So allow me to tell you about the vocabulary that I use. The vocabulary suggested in this paper gives specific color-meanings to the words as they are used by this writer. It is not necessary to memorize them at first. As you read, you will undoubtedly come upon a word that you do not understand. When you do, simply refer back to this section until it becomes a part of your vocabulary as well.

Vocabulary

Value = Lightness or darkness

- The value scale identifies the prominent values as follows:

• White	
• High light	
• Low light	
• Middle gray	
• High dark	
• Low dark	
• Black	

- All of these values, if they are mixed with white and black, are neutral. That is, they are devoid of color.

White = White is the lightest value.

- White indicates the presence of all color.
- A pigment that appears to be white reflects all colors from its surface, these colors mix in the eye of the beholder and appear to the senses as the lightest neutral-—white.
    - White must be manufactured or purchased. It cannot be mixed by combining other pigments.

Black = Black is the darkest value.

- Black indicates the absence of all color.
- A pigment that appears to be black absorbs all colors leaving what appears to be the darkest neutral—black.
- Tube-Black is often manufactured by using such black compounds as soot.
- Black may also be created by mixing the three primary colors in equal strengths.

Gray = Black mixed with white.

- Black mixed with white makes gray in all its neutral variations.
- Gray is a neutral value.

Color value = The lightness or darkness of a color.

- The relative value of a color may be determined by squinting while comparing it to the value scale. As your squinting shuts out more and more light, the darkest color will vanish first and the lightest color will be the last to disappear.

Grey = The neutral that occurs whenever the three primary colors are mixed together in equal strengths and white is added to the mixture.

- When complementary colors are mixed in equal strengths, and white is added, Grey results.
- Grey is a neutral color,
- Grey 'feels' visually warmer than does gray.

Strength = how saturated and powerful the pigment is

Staining strength = The relative capacity of one color to alter the color of another.

- Tube pigments vary in their staining capacity. The pigment in some colors is so powerful that a small amount will stain a large amount of a weaker pigment. A tiny bit of Ultramarine Blue will overwhelm a much larger quantity of Yellow Ochre, for example.
- Pigments have been mixed in equal strengths when the target color is visually halfway between the two pigments used to mix it--regardless of the quantity of each color used.

Tint = A light color that results when color is mixed with white.

- Tints are identified with the following values:
  - High light
  - Low light

Shade = The darkness of color that results when a color is mixed with black or with contrasting color that darkens it.

- Shades are identified with the following values:
  - High dark
  - Low dark

Tone, Toned = A hue that has been dulled, subdued, or muted to become more nearly neutral, such as an earth color.

- A tone results when two or more colors from different sides of the color triangle are mixed together,
- A tone also results when a color is mixed with black or gray; but results in muddied color to one degree or another)
- Pure hues are rare in nature. Most colors are toned to some degree.

Color = A generic term for color or 'coloredness'.

Hue = Bright, intense color.

- Hues, when mixed together, create all other colors,

Intensity = The brightness or dullness of a color.

- Intensity is the degree to which a color is either brilliant or subdued, dulled or muted.
- Intensity ranges from pure hues to complete neutrals.
- An intensity scale identifies the prominent intensities as follows:

Pure hue	
High intensity	
Medium high intensity	
Middle intensity	
Medium low intensity	
Low intensity	
Neutral (grey or black)	

Plane = a flat or level surface.

YOU CAN'T PAINT WHAT YOU CAN'T SEE...

Learning to See

We will begin not by mixing color, but by learning to see and understand color

relationships, for what one cannot see—and recognize—one cannot paint.

For example: As children we learned to draw in symbols. The 'lollypop' symbol we used as a child to describe a tree represented 'tree-ness' to us until we began to ‘see’, very specifically, the characteristics of trunk, limb and leaf, that made our representation more nearly 'tree-like'.

In our youth, we learned that the primary colors are Red, Yellow and Blue. We were told that these are the basic colors from which the millions of colors that we see about us result. And yet, we are perplexed when we discover that there are many Yellows, Reds and Blues; and that when we mix a particular Red with a particular Blue the result yields purple, while mixing the same Red with another blue yields something else instead. Until we can see and recognize the differences in color as clearly as we can see the difference in trees, we will find it difficult, indeed, to mix color accurately. This book will help you learn to do this.

How is this to be done?

Recognizing and duplicating color

Our first effort will focus on learning to see the colors about us in all their manifestations from brightest hue to their most neutral gray.

There are millions of colors in nature. The variations are almost endless. I am told that while there are over 115 different variations of Green in the average forest scene, a slide differentiates only fifteen of them, while a color print can identify only seven.

Meanwhile, the unseeing novice painter is prone to think of Green as the color in the Green tube, and believes that the only source of green comes from the tube itself; with the unhappy result that the same Green is repeated over and over in his or her painting - and the same Red and the same Blue - until ‘boredom-do-us-part’. It is much like eating tuna fish sandwiches for lunch everyday when, with a little effort, you have free access to the delicatessen. One well versed in color, on the other hand, can paint from nature and mix every variation he can see, much to the delight of the viewer.

So how do we learn to see color?

For purposes of recognition, it is easiest to identify every color, with very few exceptions, as being a variation of either Orange, Green or Violet.

The color that we first mistake for pure red, may actually be a Red-Red-Red-Violet (RRRV) or a green–green-blue (GGB) may be mistaken for a pure green. So it is with other more challenging colors to identify. But in the end, if you can learn to identify each color that you see as either Orange, Green or Violet your ability to recognize color will improve dramatically.

It is not well known that of the three primary colors, Yellow is the only one that is true to hue (meaning that it is a true yellow). For there are several tube colors that look Yellow, but , in actuality, are either Yellow-Yellow-Yellow-green (YYYG) or Yellow-Yellow-Yellow-Orange (YYYO).

All of the Red tube colors tend to fall slightly to one side or another of a true hue as well. All of them are slightly orange or slightly violet to some degree.

Blue colors do the same, and tend to be slightly violet or slightly green.

Because of these variations one cannot successfully use the primary colors as the basis for identifying other colors visually; and it is much more useful for the observer to identify any object's color by asking a simple question "Is it that object Orange, Green or Violet?" If an object is brown, the novice will soon learn that it is in the orange family. The next question should be, "Does the brown tend to be more Red-Orange, or more Yellow-Orange, and if so, how much?" If it is determined that the brown is on the Red-Orange side, the observer should attempt to discern (and this takes some practice and color mixing experience) the color that was used to alter the original hue. Experience will show us that altering a Red-Orange enough to make a deep, rich brown requires that it be mixed with the blue violets and Blue-Greens far across the color triangle. The ability to "see" or "sense" the color used in the toning procedure can be learned by persistent practice.

An anecdote may help to clarify this concept. An artist and his wife were in a furniture store selecting a carpet for their bedroom. He and his wife had already decided on a color scheme that required a subdued (toned) Blue-Violet carpet.

The salesman looked on with obvious interest as the husband and wife were expressing their preferences punctuated with witty dialogue. At one point the artist husband looked at a carpet that was rolled out onto the floor. He discerned carefully the colors that had created the dye that was used to stain the carpet before them, said "No, my dear, this one won't do; it has a little too much orange in it." That statement caused the salesman's face to redden a bit, and as he walked rapidly toward the couple he said "Come one now, there is not a speck of orange in that carpet! I challenge you to show me any orange at all."

He simply did not understand that a hue that has been used to tone another color is rarely discernable in the final product.

A later discussion, entitled 'analyzing color' will help you to identify and duplicate the colors that you see.

Color Vocabulary

[Before trying to understand the vocabulary below, you will be wise to take out the color triangle and use it as a visual reference.]

Using hues to mix color

- Hues are identified by color families on the color triangle; one side of the triangle is in the orange family, the second side of the triangle is on the green family and the third side identifies all the colors in the violet family of color.
- When pigments are mixed that reside on the same side of the color triangle pure hues result.
- When hues from one side of the color triangle are mixed with hues on either of

the other sides, toned color results,

- When hues are mixed that are directly across from one another on the triangle, they become neutral (grey or black). This mixture is often mistaken for “mud”. And is—unfortunately—often thrown away.
- There are several families of color. Primary, secondary, tertiary, quaternary and cinquenary colors. Each of these is discussed below:

Primary colors (the first family of color)

- The primary colors are Red, Yellow and Blue.
- Primary colors cannot be mixed by combining other colors, but must be purchased or manufactured,
- In a perfect world, where Red, Yellow and Blue pigments were true to hue, all other colors could be mixed by mixing Red, Yellow and Blue. This however is not the case in the real world.

Secondary colors (the second family of color)

- The secondary colors are Orange, Green, and Violet.
- A secondary color may be mixed by blending two of the primary colors until the resulting hue is visually midway between the two primaries.

Tertiary colors (the third family of color)

- The tertiary colors are Yellow-Orange, Red-Orange, Red-Violet, Blue-Violet, Blue-Green, and Yellow-Green.
- A tertiary color may be mixed by blending a primary color with a secondary color adjacent to it on the same side of the color triangle. Mix the two hues until the resulting hue is visually midway between the two.

Quaternary colors (the fourth family of color)

- The quatenary colors are Yellow-Yellow-Orange, Orange-Orange-Yellow, Orange-Orange-Red, Red-Red-Orange, Red-Red-Violet, Violet –violet-Red, Violet-Violet-Blue, Blue-Blue-Violet, Blue-Blue-Green, Green-Green-Blue, Green-Green-Yellow, Yellow-Yellow-Green.
- A quaternary color may be mixed by blending a tertiary color with either the primary or secondary color that is adjacent to it on the same side of the color triangle. Mix the two hues until the resulting hue is visually midway between the two.

Cinquenary colors (the fifth family of color)

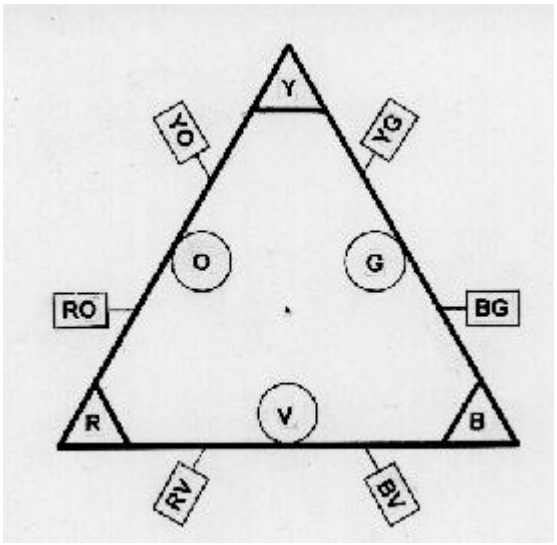
- The Cinquenary colors are Yellow-Yellow-Yellow-Orange, Yellow-Yellow-Yellow-Orange-Orange, Orange-Orange-Orange-Yellow-Yellow, Orange-Orange-Orange-Yellow, Orange-Orange-Orange-Red, Orange-Orange-Orange-Red-Red, Red-Red-Red-Orange-Orange, Red-Red-Red-Orange, Red-Red-Red-Violet,

Red-Red-Red-Violet-Violet, Violet-Violet-violet-Red-Red, Violet-Violet-Violet-Red, Violet-Violet-Violet-Blue, Violet-Violet-Violet-Blue-Blue, Blue-Blue-Blue-Violet, Blue-blue-Blue-Green, Blue-Blue-Blue-Green-Green, Green-Green-Green-Blue-Blue, Green-Green-Green-Blue, Green-Green-Green-Yellow, Green-Green-Green-Yellow-Yellow, Yellow-Yellow-Yellow-Green-Green, Yellow-Yellow-Yellow-Green.

- A cinquenary color may be mixed by blending an equal strength of a primary color with a quaternary color on the same side of the color triangle; a secondary color with a Quaternary color or a tertiary with a quaternary on the same side of the color triangle. Mix the two hues until the resulting hue is visually midway between the two.

The Simple Color Triangle:

Color wheels are in common use, and while they can be helpful if you understand them, I have found that using a color triangle, instead, is much easier for me to understand and use. Primarily because it is easier for me to visualize, and secondly I need not have a color triangle with me to identify color. Because I understand the concept, a quick sketch of a triangle on a slip of paper will quickly help medetermine my color choices without resorting to a color wheel.



This simple color triangle identifies the primary, secondary and tertiary colors. In each corner you will find the primary colors Yellow, Red and Blue. The secondary colors (Orange, Green and Violet) are found in the circles midway between the primary colors, and identify the family of color on that side of the triangle; while the tertiary colors, (Yellow-Orange, Red-Orange, Red-Violet, Blue-Violet, Blue-Green and Yellow-Green) are found in the boxes that radiate outward from the color triangle mid-way between primary and secondary colors. The color triangle will help you learn to mix color in ways that a color wheel cannot.

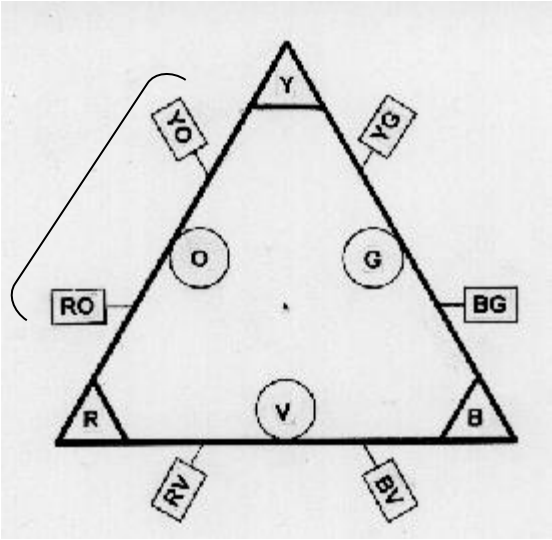
NOTE: Before studying the section on color systems, remove the transparent color system templates from the pocket in the back of the book. As each color system is discussed, Place the appropriate template over the pin in the center of the color triangle as needed. Then rotate the template to locate the many combinations of colors that are available within each color system.

Color Systems that will assure you color harmony

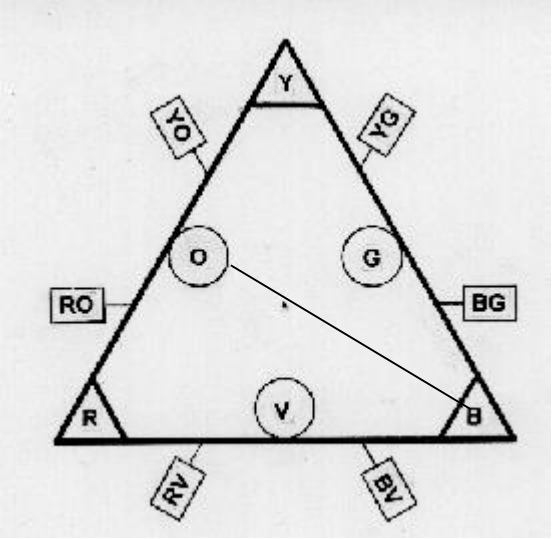
When using the color systems that follow you will discover that the templates identify the primary, secondary or tertiary colors that may be used to create beautiful color without fear of 'muddied' combinations.

The color systems are:

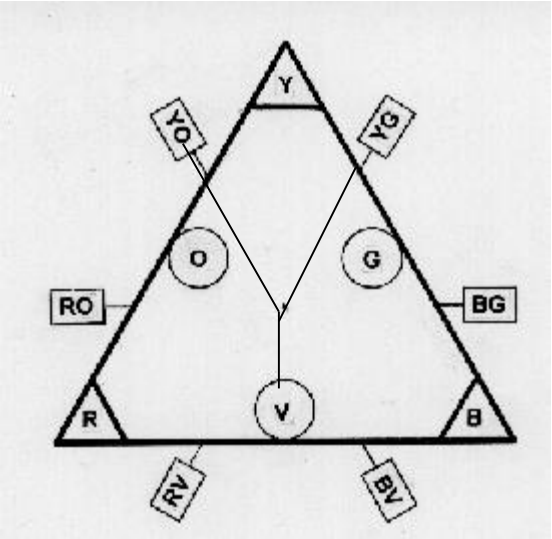
Monochromatic colors = one single color plus white and/or black. (Diagram not shown)



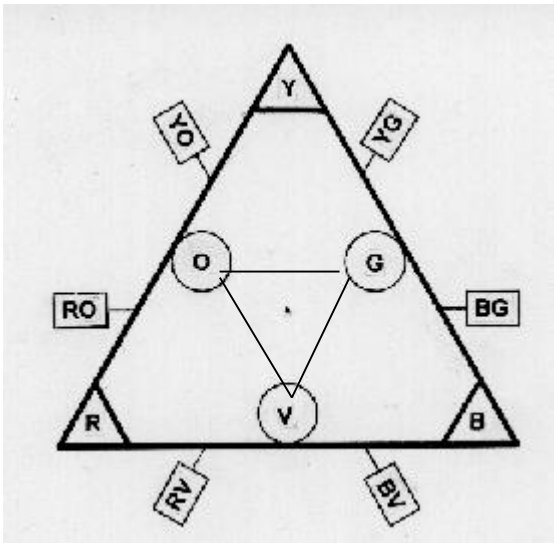
Analogous colors = colors that are adjacent to one another on the color triangle (Note the bracket).



Complementary colors = colors that are directly opposite to one another on the color triangle. (Note that the line connecting them passes through the center dot.)



Split-complementary colors = a single color together with the two colors that lie adjacent to the complementary color that lies on the far side of the triangle.

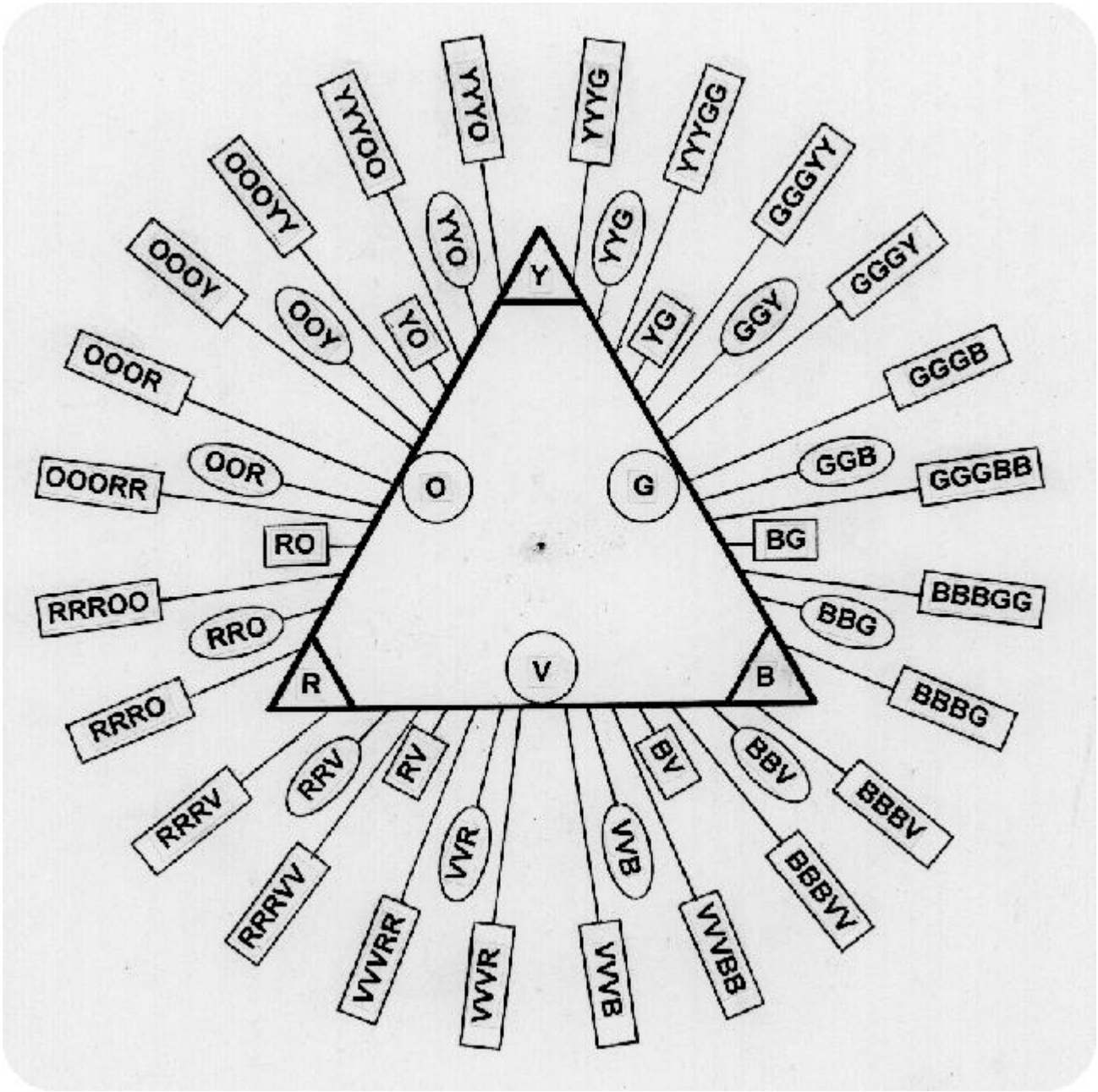


Triad colors = any group of three colors that are identified at the corners of an equilateral triangle.

(Continue on the next page)

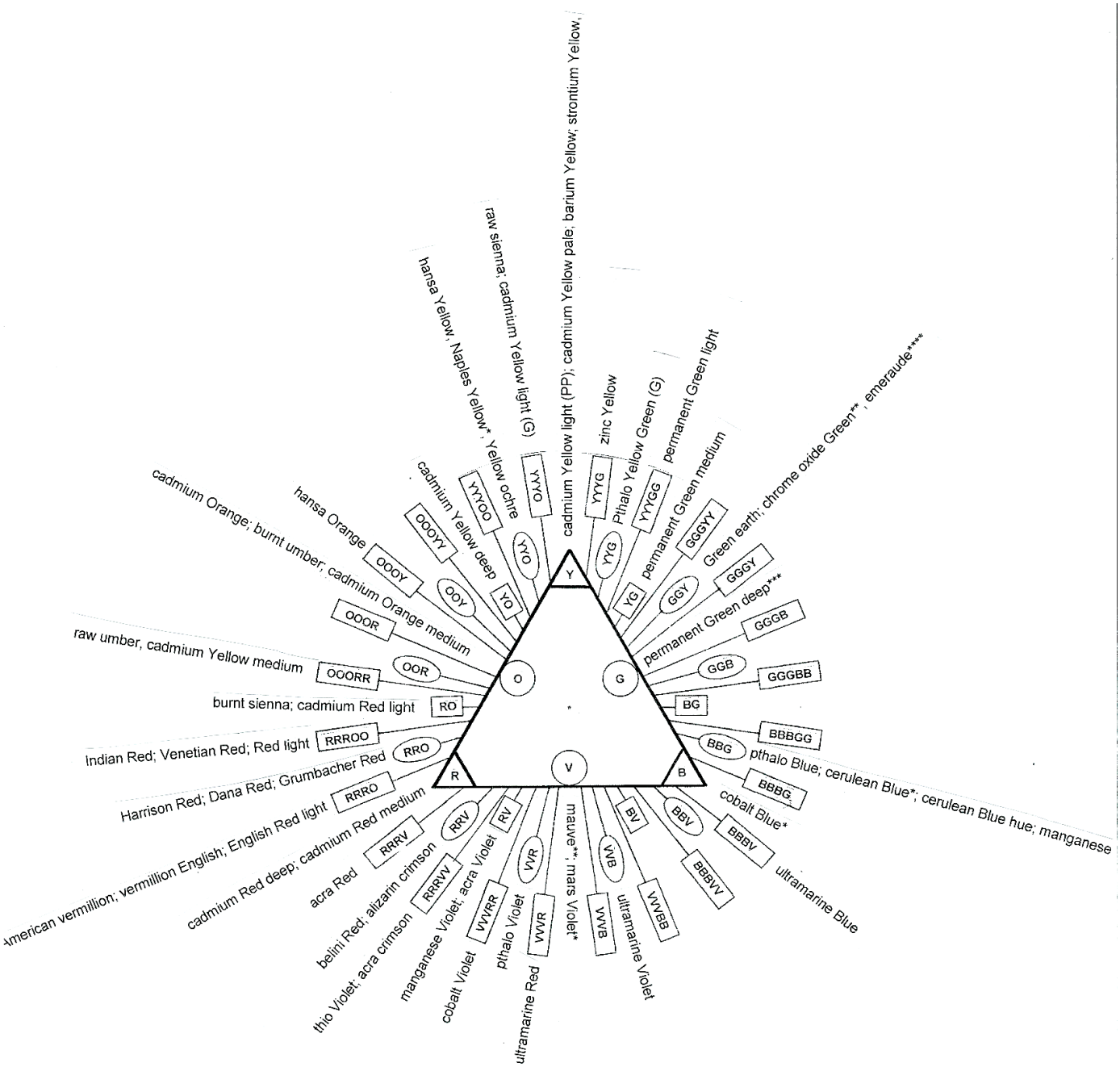
The complex color triangle:

For the beginner who paints with oils or acrylics the complex color triangle is a boon. For in addition to the primary, secondary and tertiary colors identified on the simple color triangle,the complex color triangle also identifies the hue of tube colors in relation to one another. This triangle also identifies colors that fall in the quaternary and cinquenary range.



The following page shows how tube colors relate to one another on the complex color triangle.

The hue of each listed color, regardless of tone, was identified visually by Frank Erickson, a landscape painter of note. The hues were identified by the visual process of placing colors in juxtaposition with one another to determine their placement on the complex color triangle. This listing is only a sampling of the many colors that could be added. You are invited to pencil in other colors as you discover their appropriate placement.



THE COMPLEX COLOR TRIANGLE
Used to identify the hue of many of the tube colors used by artists.

Acronyms and the Tube colors that match them

For your convenience, the following is a listing of the colors shown in the above illustration.

Manufacturer code: (pp) = Permanent Pigment; (G) = Grumbacher

Y	cadmium Yellow light (PP); cadmium Yellow pale; barium Yellow; strontium Yellow,
YYYG	zinc Yellow
YYG	Pthalo Yellow Green (G)
YYYGG	permanent Green light
YG	permanent Green medium
GGY	Green earth; chrome oxide Green**, emeraude****
G	permanent Green deep***
GGGB	Pthalo Green
GGGB	veridian Green
BBBGG	prussian Blue**
BBG	pthalo Blue; cerulean Blue*; cerulean Blue hue; manganese Blue
B	cobalt Blue*
BBBV	ultramarine Blue
BBV	
BBBVV	
BV	
VVVBB	
VVB	ultramarine Violet
VVVB	
V	mauve**; mars Violet*
VVVR	ultramarine Red
VVR	pthalo Violet
VVVRR	cobalt Violet
RV	manganese Violet; acra Violet
RRRVV	thio Violet; acra crimson
RRV	belini Red; alizarin crimson
RRRV	acra Red
R	cadmium Red deep; cadmium Red medium
RRRO	American vermillion; vermillion English; English Red light
RRO	Harrison Red; Dana Red; Grumbacher Red
RRROO	Indian Red; Venetian Red; Red light
RO	burnt sienna; cadmium Red light
OOORR	
OOR	
OOOR	
O	cadmium Orange; burnt umber; cadmium Orange medium
OOOY	hansa Orange
OOY	
OOOYY	

YO	cadmium Yellow deep
YYYOO	raw umber, cadmium Yellow medium
YYO	hansa Yellow, Naples Yellow*, Yellow ochre
YYYO	raw sienna; cadmium Yellow light (G)

* A color that has already been toned and may be more difficult to use in the mix.

** A non-permanent color.

*** A color that varies with the manufacturer.

Things that you should know:

All colors have a specific hue, regardless of tone or value.

The color Yellow is true to hue,

Of the primary colors, Yellow is the only true hue that exists. There are several tubed Yellows that are true to hue, such as Cadmium Yellow light, Cadmium Yellow pale, Barium Yellow and Strontium Yellow.

The color Blue, in its pure form, is not true to hue.

The only exception may be cobalt Blue, which, while true to hue, has already been toned and may be difficult to use by an inexperienced painter. To overcome this problem you may wish to use Pthalo Blue when you wish to create pure hues on the Green side of the color triangle, and Ultramarine Blue when you wish to create pure hues on the Violet side of the color triangle.

The color Red, in its pure form, is not true to hue.

The exceptions to this are cadmium Red deep and cadmium Red medium. Like Cobalt Blue, they have already been toned and may be difficult to use in your mixtures. If you experience this problem you may wish to use Acra Red, or alizarin crimson to mix pure hues on the Violet side of the color triangle, and American vermillion, English Red light, or Grumbacher Red to mix pure hues on the Orange side of the color triangle.

OVERCOMING COLOR PROBLEMS

Rescuing muddied color

Mixing muddy color is a persistent problem faced by beginning painters. A novice painter, unacquainted with how colors tone one another, too often finds that his experiments in mixing color result in a mixture that looks a lot like mud. This condition often results from mixing too many colors together. So what can be done now? Should your expensive paint be thrown away, or can it be rescued?

The very process that makes toning so effective is in progress here. Once the toning process is understood you will understand why your beautiful color turned to ‘mud’ and how to restore it to a beautiful color. Do you remember that when complementary colors are mixed together that a slight muddiness occurs? This comes about when the three primary colors are too nearly of equal strengths in

the mix. The closer one comes to an equal balance of the three primary colors, the muddier (more neutral) the color will appear until it finally becomes black or grey.

Has the light dawned yet?

To rescue a muddied color, simply select one of the prominent colors that is already in the mix and add it to the mixture until the 'muddiness' disappears.

Using a 'Mother color'

But fortunately there is a good use for muddy color. Does that surprise you? Some beginning artists find it frustrating when they discover that the colors in their painting do not seem to harmonize with one another. This can easily be resolved. If you should not wish to use one of the color systems, you may wish to use a muddy looking 'mother color' to help you to achieve color harmony. Using the colors that will be the most prominent in your painting, simply mix a generous amount of a color that is near to a neutral grey (yes, it will have a muddy appearance); then, as you continue to paint, mix a little of the 'mother color' with every other color you use.

Color value

The word value has several dictionary meanings; but for artistic purposes, value has nothing to do with money or worth; but means, rather, the degree of lightness or darkness that is observable in the elements of the composition. Variations of light and dark are seen everywhere. It is value, not color, that gives form and dimension to everything we see. .We 'read' the things around us by observing the way values play against one another. It is for this reason that using value accurately is so crucial in describing the objects in a painting.

When value and color are used together, it is best described as color value.

Value describes the continuum of color from white to black. Values may be readily placed in the following categories:

• White	
• High light	
• light	
• Low light	
• Middle value	
• High dark	
• Dark	
• Low dark	
• Black	

The following principles will enhance your use of value

- When speaking of values, the seven value categories may be generalized into fewer categories, by describing them as light, middle and dark keys
- The form and shape of objects around us are described by light and shadow. The sharper the delineation between light and dark, the easier identification becomes. Lessened contrast in subdued, or very intense, light makes identification more difficult.
- Light objects appear to be lighter when they are contrasted against dark objects, and dark objects appear to be darker when contrasted against light objects.
- Where the edge of a light plane joins the edge of a dark plane, the edge of the light plane will appear to be lighter and the edge of the dark plane will appear to be darker.
- Objects of a similar value blend into each other visually and are not easily distinguished from one another regardless of color or texture
- White pigment, when used alone, can never adequately describe the brilliance of light. To enhance the feeling of luminosity, one must contrast the white sharply with a dark background.
- The use of black to darken colors is not recommended for the beginner for this reason. Black is often manufactured from soot, and when white is added it is reveals itself to be a deep, muddy, Blue. When one mixes a muddy Blue to another color it stands to reason that it will muddy that color as well. While muddy color is useful when the artist is expressing squalor, fatigue, or dissonance, it is not usually desirable.
- If you should ever have the need of black, simply mix equal strengths of Ultramarine Blue and Burnt Umber.

Readability

Contrasting values have much more to do with the visual readability of a painting or drawing than does the color used. When seen from a distance, adjacent colors that are of the same value, regardless of hue, will seem to blend together and will lose definition.

- As an experiment, do a quick sketch. Paint two adjoining planes with two complementary colors of the same value. Then paint similar planes using the same colors but one much lighter or darker than the other. Stand far back and observe the difference.

Establishing a center of interest

- Excellent works of art have a center of interest. That is, there is a specific part of the painting which the artist wishes the viewer to focus upon. This point is

called the center of interest.

This is done in several ways.

- Often, the object nearest the center is the center of interest.
- Color and value play an important part in establishing a center of interest. For example, the brightest hues are commonly found at the center of interest, and the spot in the painting where the lightest light plays against the darkest dark is the most compelling indicator of the center of interest.
- Artists often use subtle pointers (rhythms) throughout the painting to lead the eye toward the center of interest.

You are now ready to begin painting! Here are some tips.

If you do not already have your art supplies I have found it useful to purchase the twelve key oil colors, a palette (a piece of glass will do), brushes, and/or palette knives that can be used either for painting or mixing. I have also found buying a pad of oil practice paper to be useful.

Selecting your colors

Now that you understand how colors relate to one another on the color triangle, and the effect they have on one another when they're mixed together, let's look at the tube colors that I have chosen to use. If the colors in your possession differ from these, the complex color triangle will help you how they relate to one another. The tube colors that a beginner may wish to purchase are:

Cadmium Yellow Light, Naples Yellow, Viridian Green, Pthalo Blue, Cerulean Blue Hue, Ultramarine Blue, Alizarin Crimson, Cadmium Red light, Burnt Umber, Raw Umber, Yellow Ochre and lots of Titanium White. (As mentioned before, I have chosen never to use black because it is so easy to mix if I need it.)

Using a template to identify compatible colors

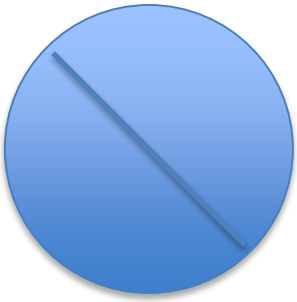
In a pocket at the back of the book a complex color triangle will be found. The round plastic template that is attached to the triangle is used to identify the complementary (red line), split complementary (green lines) and triad (black lines) color systems that are described in this book. By rotating the template you can easily identify the color combinations that you desire.

If you are printing this book from the Internet it will be necessary for you to make your own templates. The steps are:

- Print the complex triangle to the size you desire.
- Paste it onto a cardboard circle
- Cut three circles of a moderately heavy plastic sheet of the same size as the cardboard circle
- Place a thumbtack in the exact center of the cardboard circle

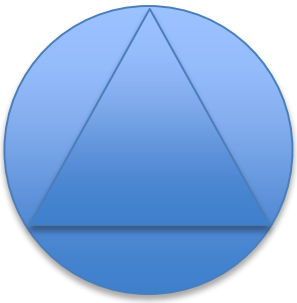
- Using the thumbtack, poke a hole in the center of each of the plastic circles.
- Place the plastic circle over the thumbtack in such a way that the plastic circle spins freely from the center.
- Now, with the plastic in place over the complex triangle, use a permanent marker to draw the appropriate lines on the three plastic circles as follows:
    - OR: You may wish to use one plastic sheet and draw each of the templates on the plastic used three different colors of permanent marker.

- Complementary color template:



- Split complementary color template:

- The triad template:



Observing the object to be painted

As you analyze the color of an object that you wish to paint, it will be helpful if you are responsive to your feelings as well as your eyesight. For it is an experience that requires both seeing and feeling. Pure hues can be identified by sight; but your efforts to discover which combination of colors are needed to replicate the color of the object becomes an adventure, It is there that both your eyes and your feelings will come into play; for some things are 'felt' more than they are 'seen'. [1 Nephi 17:45]

Let me give you an example: My wife and I were searching for a new carpet for our bedroom. As we looked at samples we set aside a few of the carpet samples that best matched our color scheme. Two samples became the finalists. After analyzing the carpet samples against our other samples, I said "This one won't do, there is too much orange in it". (Meaning that the color used to tone the sample (though unseen) was not compatible with the rest) Because my wife was used to hearing me analyze color endlessly, she understood; but the salesman was obviously upset. "Show me any orange in that carpet!" he argued. "There's not a speck of orange anywhere." And it was true—as far as he could see.

Learning to see and 'sense' colors well enough to analyze their basic color elements takes some determined effort and concentration at first; but after some practice you will begin to see colors that you were blind-to before. Sometimes it requires seeing things in groupings to recognize the differences. You already have learned that true white does not exist in nature because every white you see is tinted to a slight degree. Some are yellow white, some blue white and so on. For example a shirt in my closet is yellow white, but when the pocket was torn and replaced with a blue white pocket, it turned out that all whites are not the same, and the difference was obvious.

The same differences occur with grey. As it is with whites, greys tend toward one color or another though to the untrained eye they appear to be neutral.

Skin tones, too, have color variations that are significant. A ruddy face often show a preponderance of red, while my own face, while still having normal skin tones, tends toward greenish hues. In both, hints of orange, blue, and violet are commonly there (but not easily seen), especially around the eyes. For analytical purposes I have suggested that every color you see is either orange, green or violet. Allow this approach to become your quiet tutor and watch for the variations of color in the faces of your friends and loved ones, and on one fine day, usually in diminished light, you may be surprised to see their faces light up in Technicolor! For a portrait painter it is essential to see the delicate color nuances in his subjects.

Practice these simple steps toward color awareness:

Some color samples from a paint store are included in the book. I ask you to use your paint set to match each of them. You will find written on the back of each swatch the colors that were used to achieve what you see. But since there are

many different mixes that will achieve that same color, it is recommended that you look on the back only if and when you become baffled. It will be interesting to see which colors you used.

- Surround yourself with your art materials. Put small dabs of paint on your palette, prepare a practice sheet, and put the complex color triangle in a prominent place.
- Select a swatch whose color you wish to analyze.
- Decide whether the hue of the swatch you have chosen lies on the green, the orange or the violet side of the color triangle. Study the color carefully to determine its hue. It you are looking at wood, for example, and decide that it is on the orange side (which it usually is), use the color triangle to determine which hue of orange it is. The answer will lie somewhere between YYYO and RRRO,
- Using the color triangle, analyze its tone. If the hue is not pure, try to 'sense' which color on one of the other sides of the color triangle was used as the toning agent. Then try it to see if you are right. If not, try again.
- Mix a small quantity of the pigments you have decided to try. If the result is too dark to 'read', tint it.
- Compare it with the swatch and 'sense if there may be another color used in the mix.
- Continue on. It becomes very exciting when you begin to both 'see' and 'sense' color combinations.

Painting portraits

Consult the internet for ideas about how to paint portraits; though if you wish to paint portraits you may wish to add Pthalo yellow green, and Indian red to your palette.

Assignments

Value studies

- Make a rough copy of a simple painting or photo that has a lot of contrast, using only black, white and gray.
- Copy the same painting using only burnt umber and white.
- Copy the same painting using only Yellow ochre and white.
- Notice the change in contrast between the three.

Comparing staining strengths

- You have noticed that some pigments have a much more powerful staining capacity than others. If you wish to experience this phenomenon, begin by placing small, but equal, amounts of white on the palette; then, using a pin head, place a very small dab of alizarin crimson near one mass of white and an equal amount of Yellow ochre by the other. Intermix each and compare the result. Note that alizarin crimson has a much greater staining strength

Tinting your colors

- When tinting color with white, begin with the amount of white desired and add small amounts of the tinting color to it until the desired tint or shade is achieved.

Explain analogous color

A. Show how to locate analogous colors on the triangle
B. Talk about Analogous color
    1. Begin mixing using analogous color and white.
    2. Note that mixing analogous colors that lie on the same side of the color triangle does not result in toning, mixing simply changes the hue itself.
    3. Note that when one or more of the analogous colors are on another side of the triangle, that a slight toning results. As a useful example, the leaves that first come out on deciduous trees in springtime are toned very little, and the delicate hue is best achieved by mixing Yellow-Green (on the green side of the triangle) with Yellow-Orange (on the orange side of the triangle. The farther away the toning color is from the original hue the greater the toning that will occur.

Mixing complementary color

- Begin by mixing two complementary colors
- You will experience how the muddiness of color increases as the toning becomes more and more neutral.
- Once the neutral is achieved, they will realize that black can be mixed by using complementary colors.

Mixing split complementary and triad colors

Find a split complementary color combination on the color triangle and experiment with the mixing process. Try to achieve a neutral. What happened?

Find a triad on the color triangle and experiment with the mixing process. Try to achieve a neutral. What happened?