

module three:

**COLOR
MIXING
CONFIDENCE**

3.0 COLOR MATH

Color mixing is one of the most important skills for a painter! Being able to match colors accurately and mix the colors you want to mix is crucial.

Unfortunately it's also one of the hardest things to learn when you're new to painting. This is because color is very difficult to see accurately.

Color is ultimately **a function of light**. And light itself is varied and complex—and understanding it better probably deserves a course of its own.

Color is also **relative**. It can look different in different contexts. Red next to orange might look almost dull; red next to dark green will pop and seem extremely bright.

Ultimately, it's going to take some time and patience to get good at identifying and mixing colors. But there is a sort of math to it that you will get comfortable with over time.

The three factors in this “equation” are: Hue, Value, and Saturation.

In the next section, we'll go over the color wheel in more depth, but before we do, let's go over what each of these terms means.

HUE

Hue refers to the “color” of color. What would you call it? Is it green? Yellow? Purple? Identifying the hue is essentially naming the closest identifiable color.

This is very simple when colors are bright and true, but can be more difficult with dark, light, or desaturated colors.

VALUE

Value refers to the lightness or darkness of a color. This expands your colors to include versions of themselves that have either white or black added to them.

SATURATION

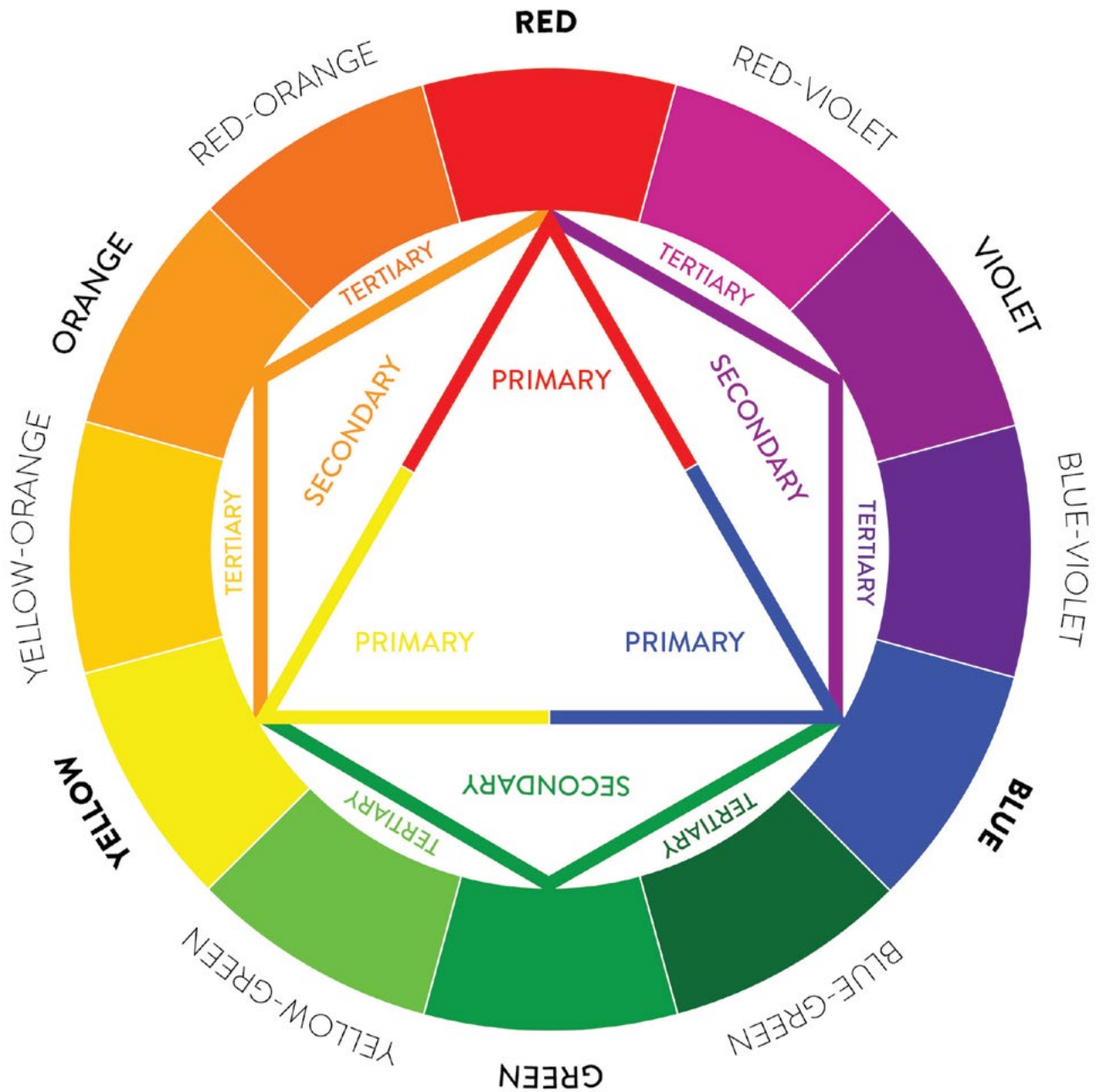
Lastly, we have saturation, which refers to how bright or “true” a color is. A fully saturated color is an unadulterated, fully pigmented version of that color. The color wheel version of a color.

Many paint colors (Cadmiums, for instance) are fully saturated when straight out of the tube. Others (like earthy Yellow Ochre) are naturally less saturated out of the tube.

Next, let’s go over the color wheel to develop a better understanding of colors and their relationships to one another.

3.1 THE COLOR WHEEL

The color wheel is a painter's best friend. Get familiar with the way colors relate to one another and you'll find mixing colors to be much easier than you would have expected!

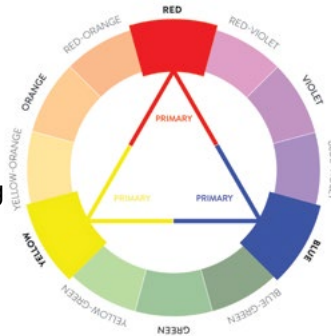


PRIMARY COLORS

The primary colors are red, blue, and yellow.

These colors cannot be mixed from other colors. Your analogous paint colors (from the list in this course) would be **Cadmium Red Light** (or Light Hue), **Cadmium Yellow medium** (or Cadmium Yellow light, depending on brand), and **Ultramarine Blue**.

I encourage you to have a warm and cool version of each primary to give you the widest range of possible mixed colors. So in addition to your three “true” primaries (each of which is on the warm side), you may also want to include: **Alizarin Crimson** (cool red), **Cerulean Blue** (cool blue), and **Lemon Yellow*** (cool yellow) in your paint selection.



SECONDARY COLORS

The secondary colors are colors which can be mixed by combining two primary colors: **Green, Orange, and Purple**.



When mixing secondary colors, you’ll want to choose the versions of your primaries that lean towards one another to get more true colors, or away from one another if you want muddier colors.

For example:

When mixing purple, which is warmer than blue, but cooler than red, you would want to use a cool red and a warm blue to get a true purple.



When mixing orange, which is one of the warmest colors, you would want to use your warmer red (cadmium) and your warmer yellow (Cadmium medium).



When mixing green, which is cooler than yellow and also cooler than Ultramarine, use your cooler blue (cerulean) and your cooler yellow (Cadmium light or lemon yellow).



TERTIARY COLORS



Tertiary colors are the colors that **bridge the gaps between primary and secondary colors.**

For example, between red and orange is red-orange. Between blue and green is blue-green.

Tertiary colors allow us to get even more specific when describing the hue of a color we want to mix.

Now, rather than just saying, "Orange," we can identify whether the orange is closer to red (red-orange) or closer to yellow (yellow-orange) which will help us mix a more accurate color.

OPPOSITE/COMPLIMENTARY COLORS

Opposite colors on the wheel (such as red and green, or blue and orange) are also known as **complementary colors.**

These colors sing when next to one another, but when mixed, will neutralize (or desaturate) one another. Use this to your advantage to take control of the saturation of your colors.



3.2 MIXING COLORS

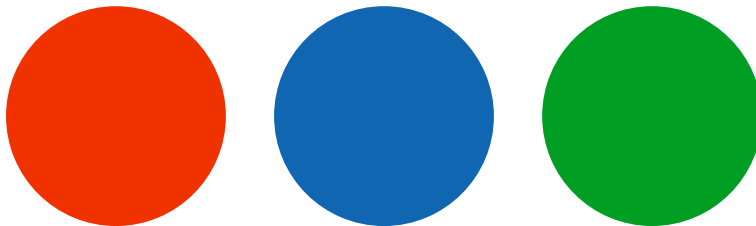
Mixing accurate color starts with choosing the color you want to match in your reference, and then defining the three factors (hue, value, saturation) for that specific color.

This is simple for some colors, but quite difficult for others.

In this section, I'm going to walk you through the process of identifying the three factors for a color to determine how you would approach mixing that color.

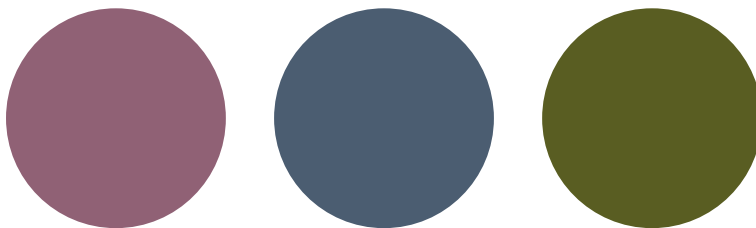
1. DETERMINE THE HUE

Take a look at the following swatches:



Each of these colors is easy to name: red, blue, and green. Each of these colors is very close to a tube color. (Cadmium red, Prussian Blue, Bright Sap Green, for example.)

It gets a little harder when the colors are darker or muddier:



Our names for the second set of colors are less defined. We might recognize the first one as a kind of mauve color. Some people might say pink, some might say purple, some might say "dusky rose."

The middle color is a sort of blue-gray; the last is what I would call a dark olive green. These colors require more modifying language because they're not straight off the color wheel the way the first three were.

And to complicate things even more, colors can look very different in different contexts. As we've said, color is relative. For example, take a look at the following scenarios:



The same color (our olive green from the last set) will appear different when in relating to different colors.

In the first shape, it looks pretty dark. It appears pretty muddy and a little on the brown side.

In the middle shape, it appears a little greener, slightly lighter, and is a little jarring, since it's set in a color close to its opposite and of a similar value.

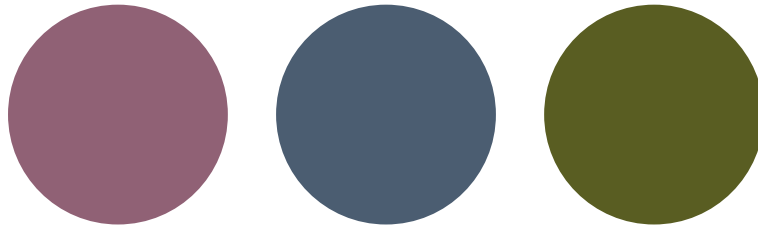
In the last shape, it appears fairly light, and also looks greener again.

(To see these effects better, cover two of the three shapes with your hand and look at them one at a time.)

The relativity of color can make identifying the color you want to mix challenging.

TIP: One way to help make sure you are seeing a color accurately is to create a viewfinder for yourself by cutting a small square in a sheet of paper. Hold this sheet up to your reference to isolate a color from what's around it. This will help you see it more clearly.

Let's return to our three muddy colors:



Identifying the hue of these three colors would require imagining what the closest color on the color wheel might be to each one.

For the first, the closest color could be red or purple. The second would be blue, and the third, green.

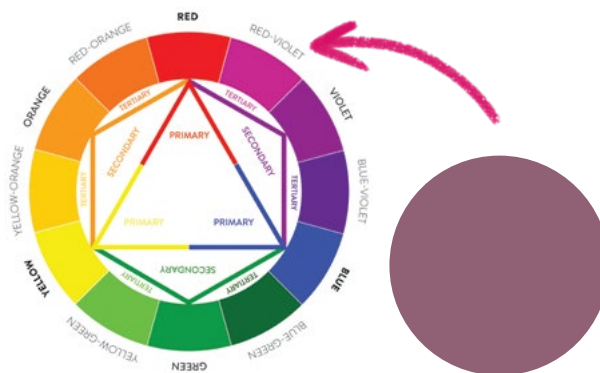
Next, to get more specific, I find it helpful to include the temperature of the color as well.

For the first, that would be a cool red or a warm purple. The second would be a slightly cool blue, and the last would be a warm green.

The temperature will help us start to identify which other colors might be present in the mix.

You can look at the color wheel to see which adjacent color is warmer or cooler than your hue, and try to locate a specific place for your hue on the color wheel.

For example, the first color is closest to red on the color wheel, but is cooler than red. That means it will be between red and blue-violet on the color wheel. It's probably closest to the tertiary color "red-violet."



Thus, when mixing, we know we will need to add a cooler color, possibly blue to our red paint as a start.

Next, we'll want to identify the value of the color.

2. IDENTIFY THE VALUE

The value of a color describes how light or dark that color is. The best way to do this is to hold up a black and white value scale to your color and try to find which value looks closest to the color itself.

As you practice, you'll find it easier to do this step in your head, but while you're learning you may want to keep a value scale handy to evaluate your colors.

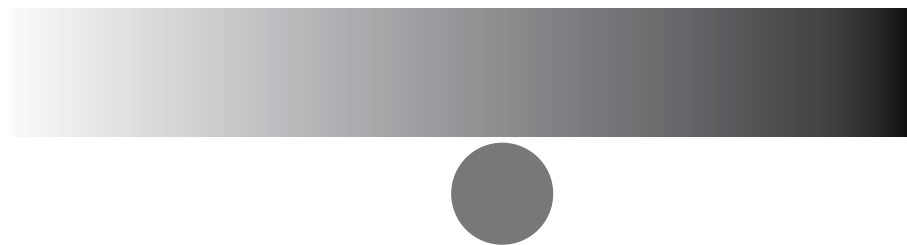
(These days, you can use technology to "cheat" a little if you want, by color picking a color in a digital application like Photoshop, and then desaturating it to see exactly what value of gray it becomes.)

Let's take our reddish color as an example again.

If I desaturate that red, here's the gray I'm left with:



If I were to compare that to a value scale, it shows up as slightly to the right of the middle:



So we know that this color is slightly darker than a perfect neutral gray. When mixing, you'll want to maintain awareness of this. Some colors you add to your mix will darken your color, and others will lighten it. You must consider and adapt to this as you're mixing.

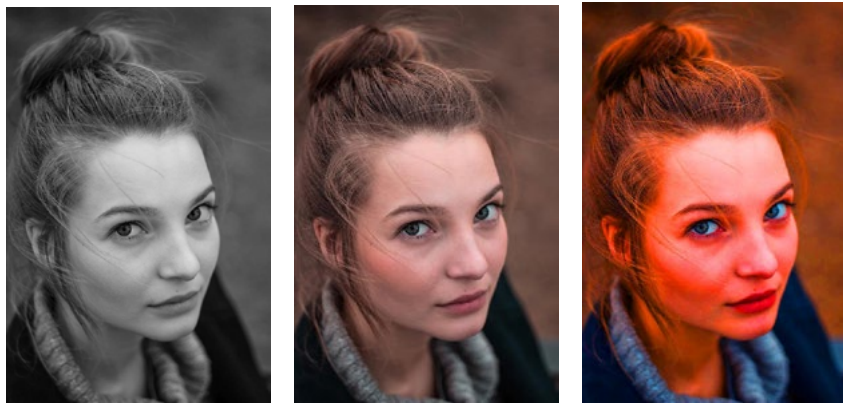
If you add a dark color, you may need to add a lighter one to balance, and vice versa, until the value of your mixed color matches the goal.

Next, we'll discuss the last factor: Saturation.

3. EVALUATE THE SATURATION

The last of the three factors is saturation, which refers to how "true" or vibrant a color is.

To help visualize this, think of a photo at different levels of saturation. A completely desaturated image is a black and white image. A highly saturated image is one with over-exaggerated colors.



Desaturated

Normal Saturation

Over-Saturated

When mixing colors, identifying how saturated your color is is an important step. But that only gets us half way there.

Next, we must know how to take control of the saturation of our colors.

As I mentioned in the beginning of this section, some tube colors are as saturated as possible straight out of the tube. Cadmium colors are good examples of this. They are about as saturated as possible.

If you're painting very bright images with lots of true colors, you will end up using more saturated colors. This is often true for images of flowers or fruit in bright light, for example.

However, much of the time your challenge will be to appropriately desaturate your colors. An image full of bright tube colors is usually overwhelming and not very naturalistic.

(In my demo videos for this course, I use an image of oranges in fabric drapery. The image has good examples of both highly saturated colors and very desaturated colors.)

One of the primary ways you can control the saturation of your color is through the use of **opposite colors**.

Opposite colors, remember, will desaturate one another when mixed together. Notice in these examples how as the colors blend, they cross through a neutral middle that is very desaturated.

This is a way to desaturate color without going all the way into gray. It keeps life and color present in the mix, but gives you control over the level of saturation.



Another feature of opposites is that they appear more saturated when next to one another. Notice how the colors in this example seem particularly bright and energetic:



By understanding how to use opposites to control the appearance and saturation of your colors, you have full control over how bright or dull you want any color mix to be.