Carding for Color Part I: Understanding and Analyzing Color

By Deb Gerish

If you print this PDF, print in color—illustrations won't be legible in black and white.

Spinners have a lot of artistic control over their raw material. We can choose a fiber or fibers to spin, then we can manipulate diameter, twist, plies, and yarn texture. Add in the dimension of color, and we can create handspun yarns that commercial mills can't reproduce. Personally, I find all that freedom a little scary—color in particular has always intimidated me, and I've never gone to art school. But when I wanted to "design" colors for my handspun, a little color theory went a long way.

If you want to blend your own colors, theory can help you too. Before you pull out the hand carders (or whatever blending tool you prefer), read this tutorial and try out the exercises. You'll probably find, as I did, that your confidence with color grows very quickly.

You'll need only a few tools for this part of the tutorial:

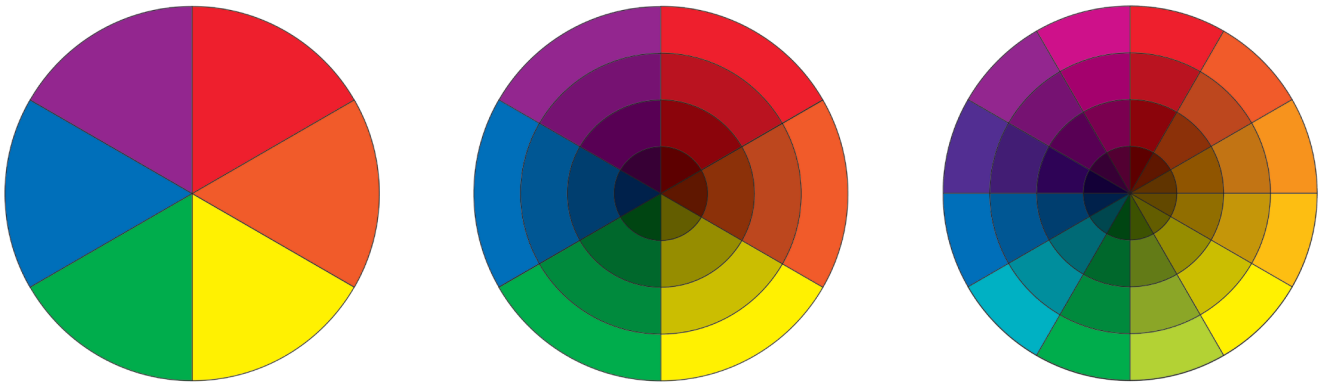
- color brochures for interior paints—grab them at your local hardware store or download one from a paint manufacturer's website
- smart phone camera, photocopier, or scanner
- multicolor fiber braids or photos of them

UNDERSTANDING COLOR

Color theory rests on a few fundamental terms. We can use this language to describe any color.

- **Hue** is the fancy name for color. It's convenient to place hues in **color families**, such as red, brown, or green. Artists also like to describe the **temperature** of a hue, from warm to cool. Warm colors often seem to project out toward the viewer, where cool ones recede from the eye.
- **Value** refers to the relative lightness or darkness of a color. Add white and a color gets lighter (called a tint); add black and it gets darker (a shade).
- **Saturation** indicates relative brightness or dullness. A saturated color is as bright as it can possibly be. Reducing the saturation takes away color, until you are left with a shade of gray—a fully de-saturated color). Saturation can lie anywhere between these extremes.*

Color wheels are terrific tools for understanding hue, color families, and temperature. They're built around a set of 3 primary colors, and they usually show the colors in between. For instance, a red-yellow-blue wheel arranges color families from red-orange-yellow-green-blue-purple and then back to red. Each color family "slice" can also show value, as in these examples.



Wheels based on the primaries red-yellow-blue. The wheel at left shows primary and secondary colors; in the center, these colors range in value. The wheel at right includes more hues (tertiary colors) in a range of values.

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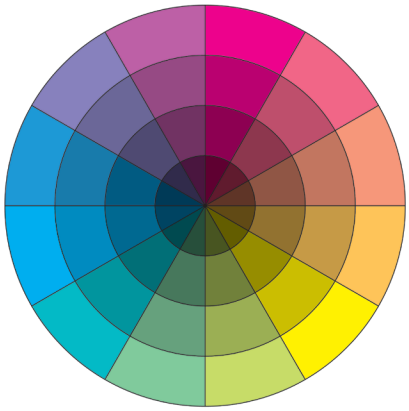
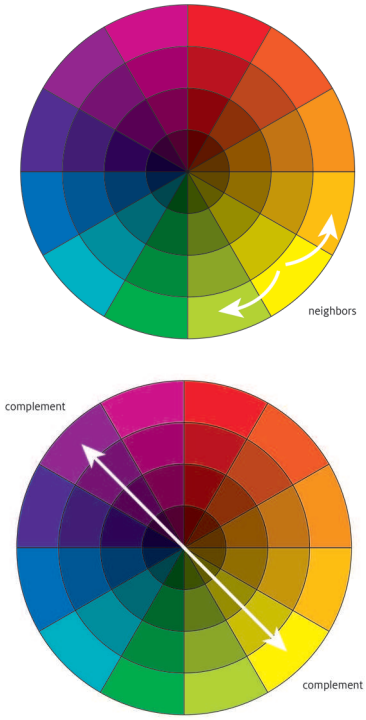
We can also build color wheels on variations of the red, yellow, and blue primary colors. Ink cartridges for color printers use a color wheel based on cyan (blue), magenta (red), yellow (yellow), and black to print all their colors. Black allows the printer to adjust value: add more to darken a color or use less to lighten it.



A color wheel based on cyan (C), magenta (M), and yellow (Y).

It's easy to see relationships between hues on any color wheel. Look at the yellow color family, and you'll see its next-door neighbors are orange and green. When you start from yellow and go to the other side of the wheel, you end up in purple; these colors are complementary because they're "opposites" on the wheel.



Yellow's neighbors are yellow-green and yellow-orange. Its complement is purple.

Color scheme designers often start with a color wheel and a time-tested set of rules to make pleasing combinations. In fact, the rules of color harmony underly all those fun color tools on paint manufacturers' websites: pick a main color, and the tool suggests coordinating schemes. You may have seen quilter's or fiber artist's color guides with a page of colors and a page of windows to lay over the colors—these guides use the same set of rules.

But color wheels can also have some limitations. First, they ignore neutrals or hues in the brown family, unless the wheel is built around brown primaries or use black, white, and gray as the primaries. Second, you may have learned to divide the color wheel in half, with red-orange-yellow as warm colors and green-blue-purple as cool ones. All color families include warm and cool hues, however. In the CMY wheel to the left, you can see cool yellows and reds, along with warm blues and greens.

Finally, simple color wheels focus on hue and maybe value, but don't do much with saturation. I've come across more complex color wheels, but I find them harder to understand or to use. I save the wheels for building color schemes, which we'll do in subsequent parts of this tutorial. For now, we'll turn to a different kind of tool.

*Nerd alert! If you're familiar with illustration programs or web design, you'll run across several color modes: RGB (red-green-blue for video and computer monitors), CMYK (for printing, discussed above), HSB and hex codes (for website colors). For our purposes, RGB isn't very helpful and HSB is downright annoying because it's confusingly named. The acronym stands for hue, saturation, and brightness; its makers define hue and saturation as I did above. But brightness is closer to value as defined above, which is why HSB is sometimes called HSV (hue saturation value) or HSL (hue saturation lightness). If you search on Wikipedia for HSB, it will redirect you to a page called HSL and HSV. Just know that all these color modes want to achieve the same goal of describing colors, and that artists use the terms and definitions that I used above.

ANALYZING COLOR

When I started learning color theory, my favorite tool came from the hardware store: I collected manufacturer's brochures for interior paints. They had booklets devoted to a single color family, or to the warm colors and cool colors, or to neutrals. In short, you'll find dozens of variations in hue, temperature, value, and saturation on every page. I would pick a few colors on each page and describe them with our terms from color theory.

We're going to use the same tool for our exercises. If you can't get to a store, some paint manufacturers' websites will have downloadable PDFs, like the one I'll use here.

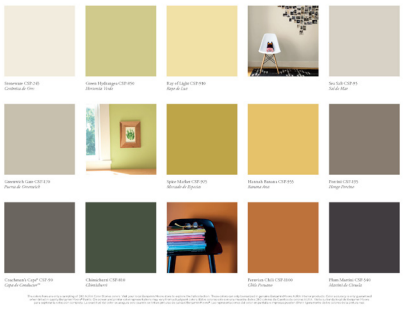
Keep in mind: these are simple, low-stakes exercises. You're just practicing this new vocabulary and training your brain to look for particular elements of color. There are no right or wrong answers—we all see colors differently and terms like "cool" and "warm," "light" and "dark," or even "blue" and "green" don't have hard and fast meanings.

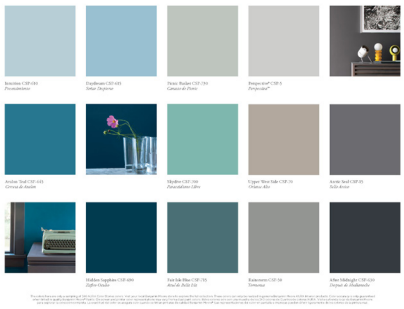
First, describe 10 different colors in terms of **hue, temperature, and saturation**. Ignore value for now. When you consider any hue, don't limit yourself to its "parent" color family—think of its overtones or undertones. A brochure of purple paints will include red-purples and blue-purples and maybe brown-purples. Off-white hues can have blue overtones (making them cooler) or yellow overtones (making them warmer). Sometimes colors will sit right in the middle of warm/cool temperature or bright/muted saturation, so create your own way to describe these situations. Your descriptions might read "warm yellow with red overtones, very muted" or "bright warm pink with a little orange" or "green with a lot of blue, very cool and medium bright."

Here are my descriptions from colors in a Benjamin Moore brochure. I often considered two or three colors together, especially when I got stuck on temperature or saturation.

1. Green Hydrangea: green with blue overtones, slightly muted, cool
2. Spice Market: green with lots of yellow overtones, bright, warm
3. Intuition: blue with gray overtones, muted, cool
4. Daydream: blue with gray overtones, muted, warm
5. Skydive: green with heavy blue and gray overtones, bright, warmish
6. Avalon Teal: blue with gray overtones, muted, warm
7. Flamenco: red with blue overtones, muted, warm
8. Tomato Tango: red with some orange overtones, bright, warm
9. Berry Fizz: purple with heavy red overtones, bright, warm
10. Elderberry Wine: purple with some red overtones, muted, cool

You might completely disagree with my answers, and that's fine. In fact, I might look at these colors under different lighting, on a different computer monitor or printed by a different printer, or just when I'm in a different mood, and wonder what I was thinking. That's okay too. Just play with the concepts and practice defining the colors you see.





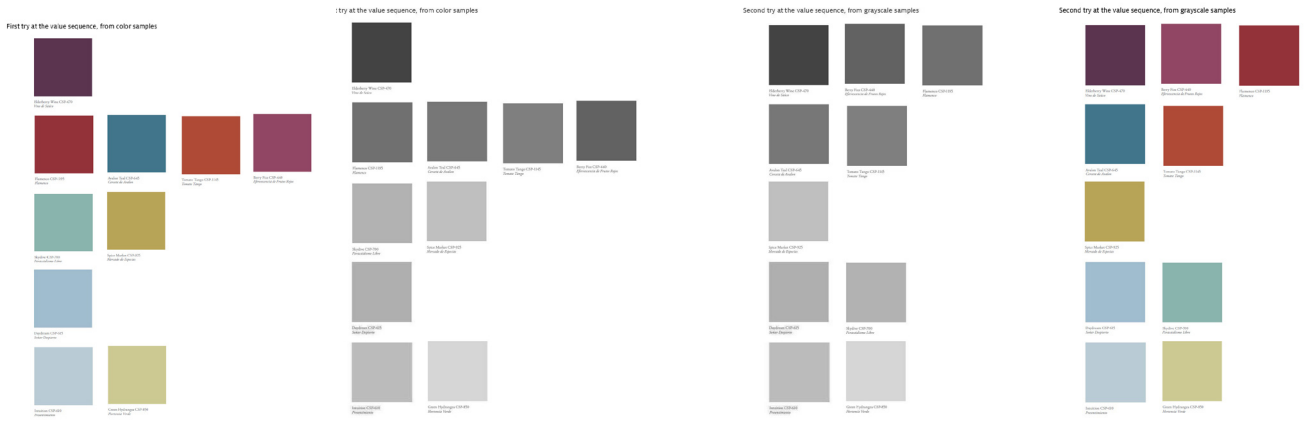
Green Hydrangea **Spice Market** **Intuition** **Daydream** **Skydive**

Avalon Teal **Flamenco** **Tomato Tango** **Berry Fizz** **Elderberry Wine**

For the second exercise, arrange colors in a **value sequence** from dark to light. You can use the colors from Exercise 1, or choose new ones from a single color family. Try it first directly from the color brochure, where you can see the hues. Then look at the hues in grayscale and do it again.* Did your value order change? Mine did! It's surprisingly difficult to "see" values in color images—remove the hues, and everything gets easier.

*If you're working with a physical brochure, you can scan it in black and white or photograph it and apply a black-and-white filter. If you're working with a PDF, "print" the file as a PDF (yes, it's already a PDF) in grayscale—this reprinting converts the PDF to black and white.

My value sequences came out as shown here, with colors arranged in rows from darkest to lightest. Every time I switched monitors, I wanted to start all over.



At left, my first try from color swatches; the first try converted to grayscale; my second try in grayscale and in color.

ANALYZING COLOR ON FIBER

Now let's think about color on fiber, using photos of hand-dyed braids sold on our website. You'll notice something immediately when you see all these images together: dyes and fibers do things to color. Shiny fibers will reflect light while matte fibers will absorb light. Dye colors will run into each other. Overdye a fiber blend with black in it, and the black will peek through.

Fiber braids can inspire your own color designs for blended fibers. Yes, you can create color schemes without dyeing! When you're comfortable describing colors by hue, temperature, saturation, and value, the rules of color harmony become easier to understand.

For our final exercise, describe the colors you see in these 5 colorways. Add any notes you wish to the colorways appearing on different base fibers. Begin with the easy ones, Shades of Denim and Victoria. Write down all your descriptions before reading mine.

Shades of Demin

Victoria

Paper Roses

Meteor Shower

Outlaw

1. Shades of Denim: I'd put this braid in the blue family, with very faint purple overtones, a warmish temperature, and medium saturation. The values range from medium-light to very dark.

2. Victoria: This braid lives in the red family, with faint purple overtones. It's a little warmer than Shades of Denim but not by much, because those purple overtones cool it down. Like Shades, it's medium in saturation and goes from medium-light to very dark in value. Because each braid stays in one color family, they are monochromatic.

3. Paper Roses: The next example, Paper Roses, takes hues from the red family and the green family. The dyer combined multiple values of a cool, muted red and a warm, muted peach with a single value of a warm, brightish, yellow-green. Red and green are complementary colors: you can see that the dyes create brown where they overlap. Normally, red and green evoke Christmas color schemes, but the dyer played with hue, temperature, and saturation to create something very different.

4. Meteor Shower: What colors did you see in the next colorway, Meteor Shower? I see medium-value red with purple overtones and dark purple with red overtones, both warm in temperature and very bright. There's also a lighter purple that's more muted. If we place these hues on a color wheel, they're neighbors—what artists call "analogous" colors.

Notice too how the fiber affects color. All our colorways so far were dyed on wool. With Meteor Shower, the first braid was dyed on a blend of polwarth, black bamboo, and silk; in its undyed state, the fiber is medium gray with streaks of black. When it's dyed, the silk adds shiny brightness but the black tones things down a bit. The second braid was overdyed on a yak and silk blend, medium gray in color. Here the silk's shine really brightens the dyed colors, and the dyes were dark enough to completely cover the yak. (I can also say from personal experience that this fiber spins like a dream. Yak might not change the colors, but it adds so much softness!)

5. Our final example, the colorway Outlaw, combines 3 colors (to my eye). It's also been photographed on 3 bases: wool, yak and silk, and wool/black bamboo/silk. I see a warm orange with yellow overtones, in medium saturation and medium value; a brightish warm green with yellow overtones, in a medium value; and a warmish blue, again in medium saturation and medium value.

Again, don't stress over these exercises. If you used different color names, or categorized temperature differently, that's absolutely fine. It may also be hard to apply the bright color wheels above to paint brochures or fiber braids: the brochures and braids have less saturated colors than the wheels. You can always make your own wheels. Mute the primaries (red, yellow, and blue, or cyan, magenta, and yellow). Or choose variations of the primaries. I tried to create a simple wheel based on Paper Roses: once I plotted the complementaries of red and green, I could triangulate for the other primaries and secondaries.

A color wheel based on Paper Roses.

Color analysis gets easier with practice. When you can describe all the elements of a color, you can blend fiber to match that color. If you can analyze the relationships between colors, you can design and use color combinations with confidence. You, the textile artist, can have unlimited power.

In the next part of this series, we'll blend fiber colors, so we can learn to control and direct our new power. You'll need half an ounce of white, black, and at least one pair of complementary colors (blue and orange, red and green, or yellow and purple). If you have colors in your fiber stash, start collecting small amounts. If you don't, get a grab bag of colors—they're widely available online at Etsy and other craft sites. If you have larger amounts, or more colors, by all means don't hesitate to pull them out. Once you start blending your own colors, you won't want to stop.

RESOURCES

There are hundreds of books, videos, classes, and tutorials for color theory and color design specifically created for fiber artists. I started with the ones listed below and keep going back to them over and over.

Colour Play Course, School of Sweet Georgia

Lo, Felicia. *Dyeing to Spin and Knit*. Interweave Press, 2017.

Menz, Deb. *Color in Spinning*. Interweave Press, 1998.

Benjamin Moore Paint Brochure