THE TMS COLOR HARMONY CALCULATOR

(Be sure to print these pages in color)

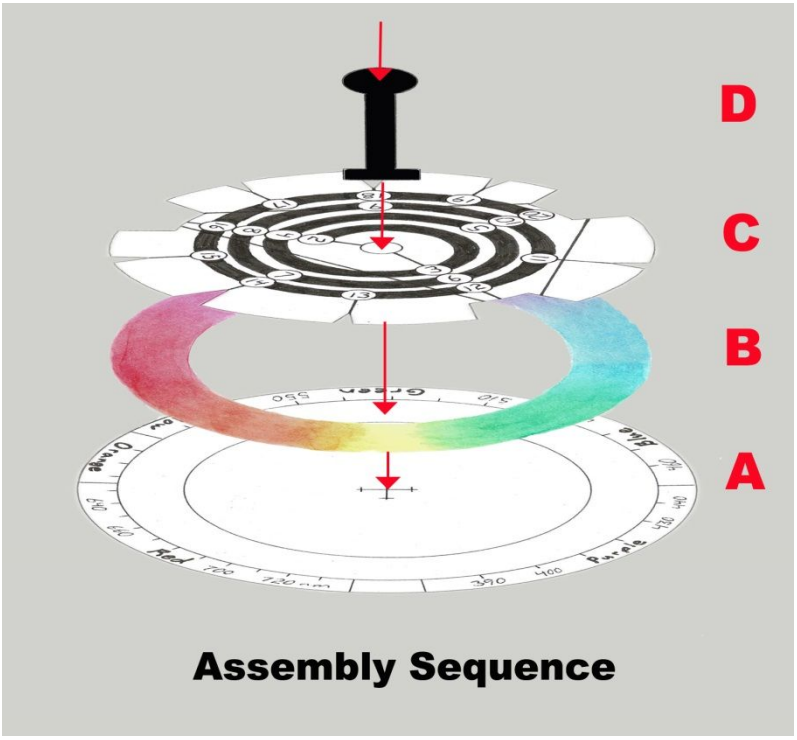
The following sheets contain information about the TMS Color Harmony Calculator. There are two sizes that you can assemble along with information about how to assemble as well as how to use it.

This calculator is used to identify which colors have the best harmonic relationship.

Important!

- Because the calculator is printed on paper, it needs to be glued to a substrate that will provide some rigidity. We recommend using card stock for the rotating wheel (C), and mat board for the base (A). However you can replace the mat board with anything similar.
- The rotating wheel (C) of the calculator must pivot in the center. We recommend using a ¼ in. binding screw (also called a Chicago screw, or a barrel nut). These screws are used in photo albums and scrapbooking. You can use anything, like a thumbtack, that will provide a pivot.

The illustration below shows the assembly sequence of the layers.



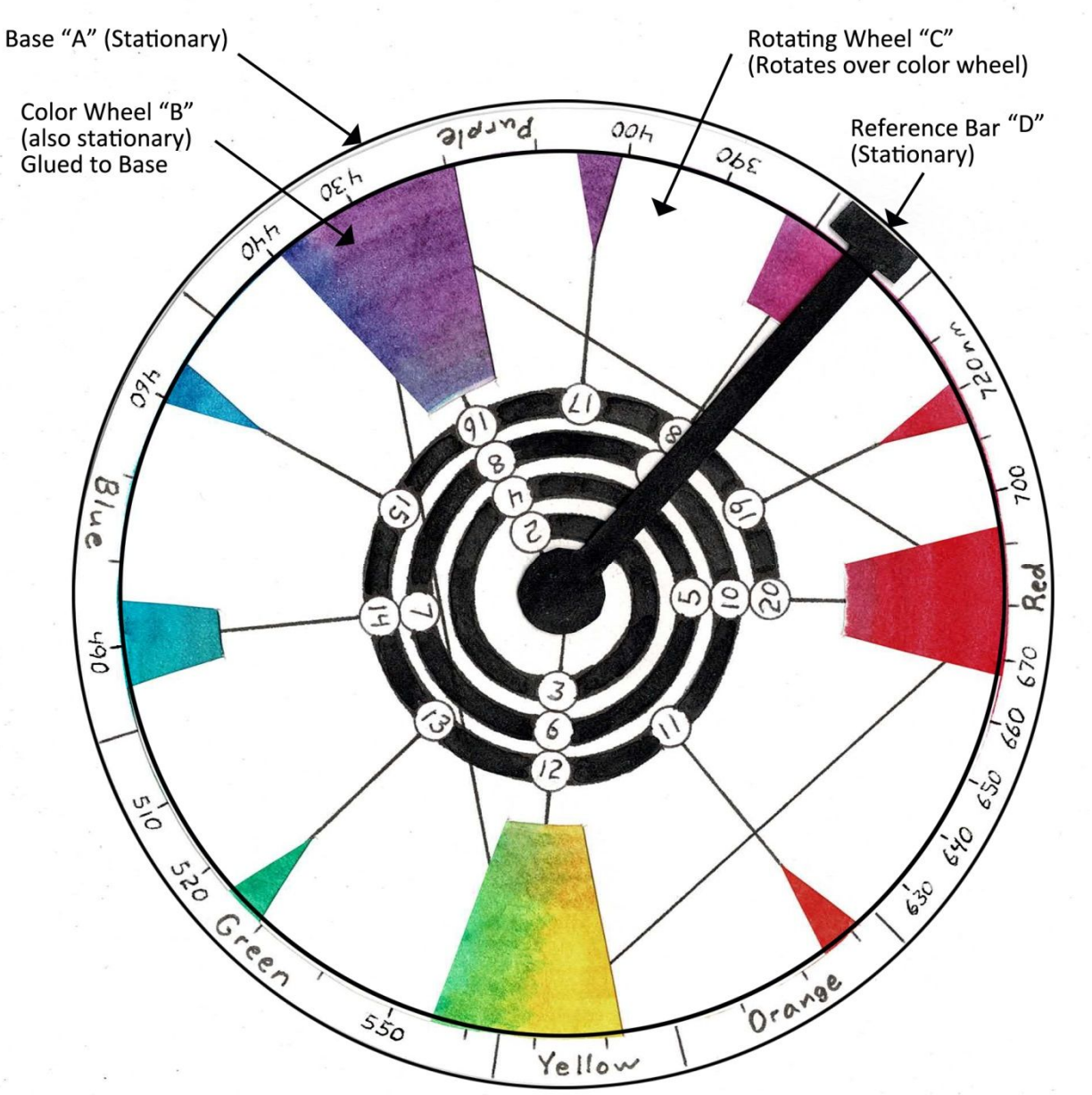
“A”, the Base, is glued to mat board or other substrate to provide rigidity.

“B”, the Color Wheel is carefully aligned with the Base and glued to it.

“C”, the Rotating Wheel is placed on the pivot screw, over “A” and “B”..

“D”, the Reference Bar is also placed on the pivot screw and the end is glued to the edge of the Base.

The assembled calculator will look like the illustration below.



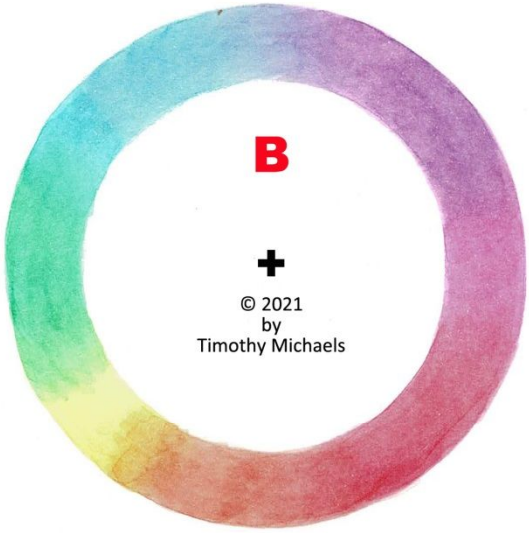
The assembly and use instructions below are followed by the templates that are to be used to build a color calculator.

Assembly Instructions

1. Decide if you want to assemble the small version or the large version.
2. Obtain your substrates. Use mat board for the base (A), and card stock for the rotating wheel (C), reference bar (D), and small rectangle spacer (E).
3. Cut out the appropriate size base (A).
4. Glue the base (A) to the mat board
5. Cut out the appropriate size color wheel (B).
6. Align the YELLOW section of the color wheel (B) with the marked YELLOW section of the base (A) and glue.
7. Make a hole in the center that is the same diameter as your pivot device. We recommend a ¼" binding screw (aka Chicago screw) used in scrapbooking.
8. Cut out the rotating wheel (C) by cutting the outer diameter first.
9. Glue the rotating wheel (C) to the card stock, then trim the card stock to match the wheel.
10. Cut out each of the slots on the rotating wheel (C). There are 3 large slots, 2 medium slots, and 5 small slots.
11. Make a hole in the center of the rotating wheel (C) for the binding screw.
12. Cut out the reference bar (D).
13. Glue it to the card stock, then trim the card stock to match the reference bar.
14. Make a hole in the end of the reference bar (D) for the binding screw. As an option you can also glue the round end to the top of the binding screw.
15. Place the binding screw into the base (A) and color wheel (B) from the bottom.
16. Place on top of that, the rotating wheel (C).
17. Finally place the reference bar (D) on top of the rotating wheel (C).
18. Fasten the pieces together using the other half of the binding screw.
19. Glue item E to the blank area located between the red (730) and purple (390) on the base (A).
20. Glue the loose end of the reference bar (D) to item E.

Using the Color Calculator

1. Rotate the wheel until the desired combination of colors appear in the large windows. There are 3 large windows but it is not necessary to use all 3. There are 2 smaller windows and 5 very small windows. These colors can also be used in the composition but to a much lesser degree.
2. Starting at the Reference Bar, find the innermost spiral band that includes all of your color selections.
3. Read the numbers on the spiral that line up with your colors.
4. This is the harmonic relationship. The lower the numbers, the more harmonic your entire color scheme will be. For example, a 3-4-5 combination will be more harmonic than a 6-8-9 combination.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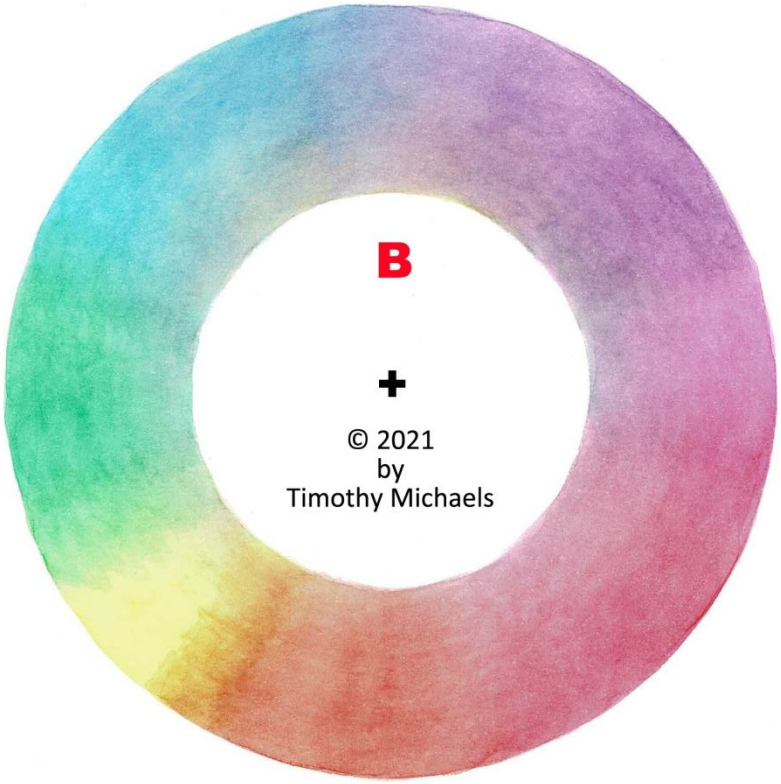
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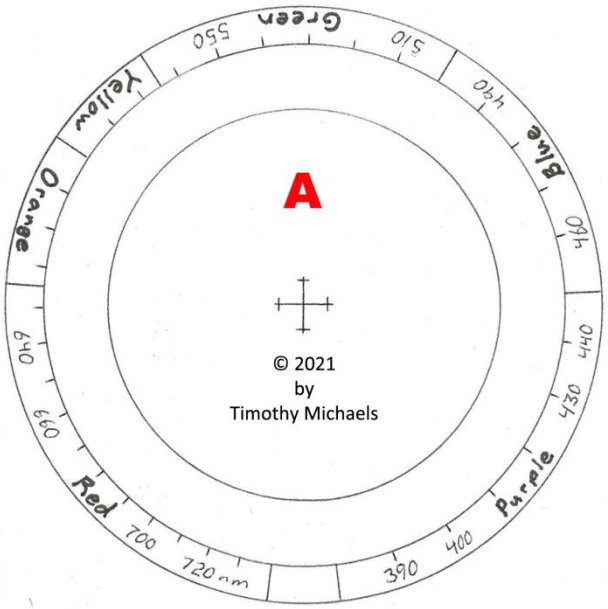
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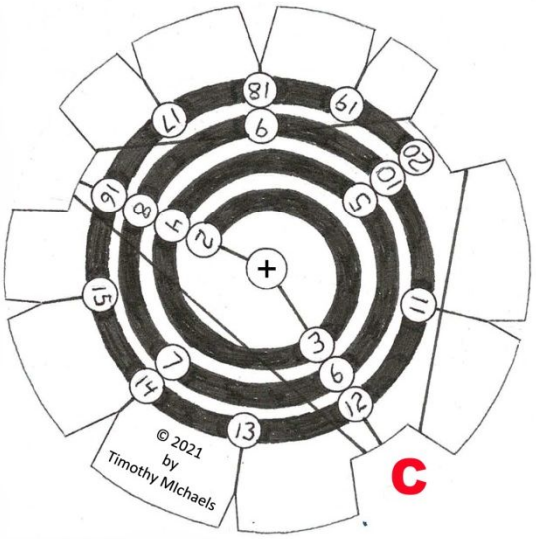
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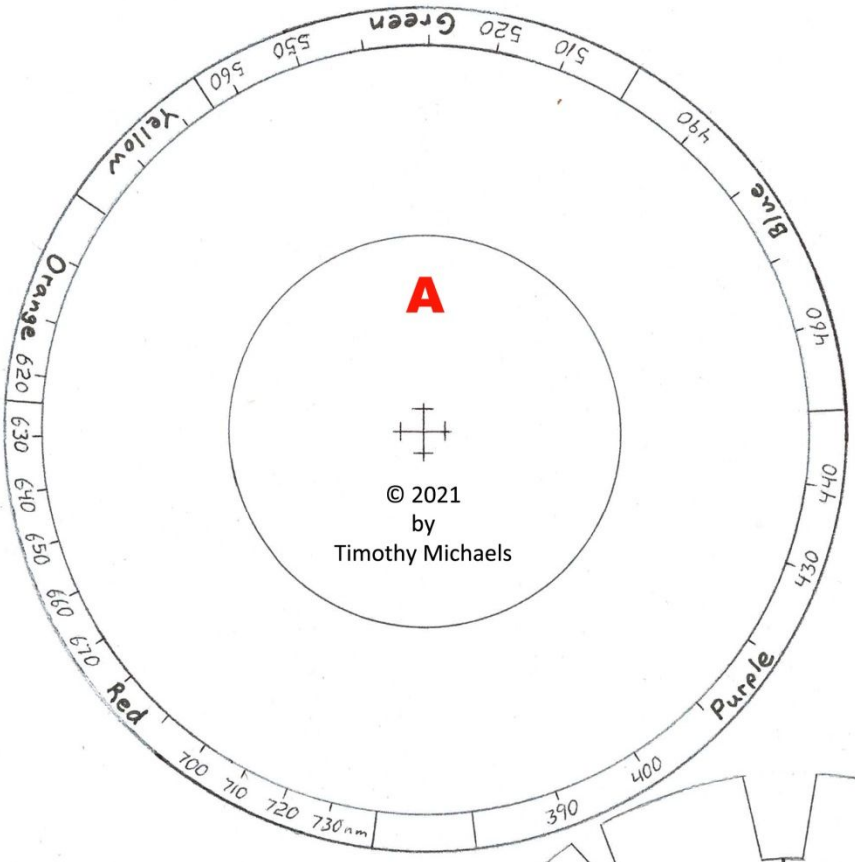
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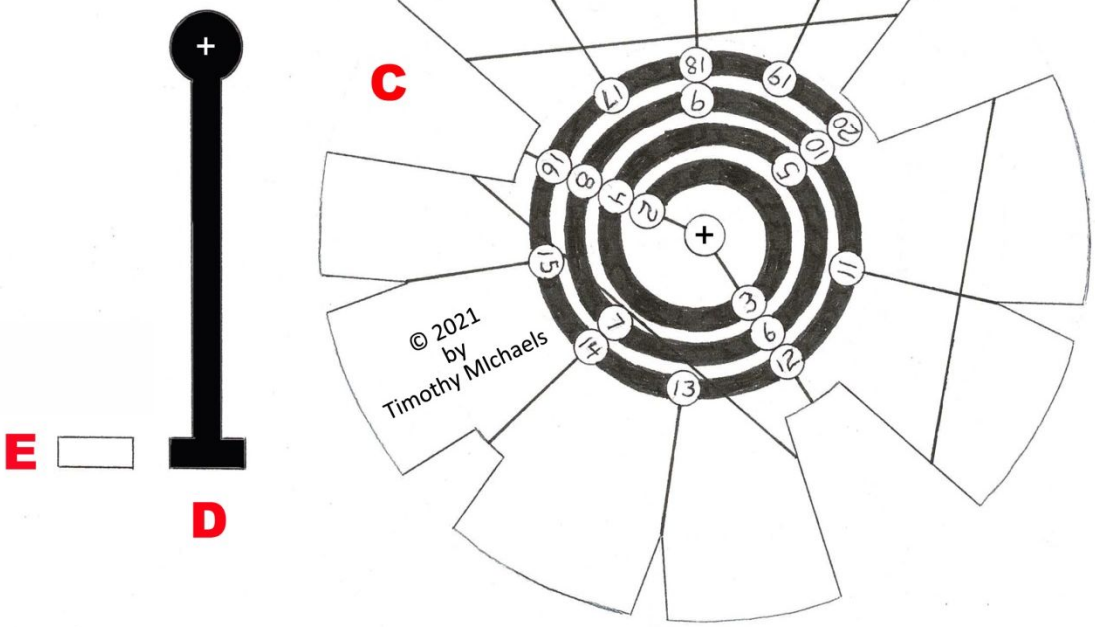
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E
D

How the Color Harmony Calculator Works

This device determines precisely how colors enhance each other, and also identifies precise complements.

It works by calculating wavelength relationships among hues. Every color gets calculated as its hue regardless of how bright or dark, neutral or pure it is. Pink calculates as its red hue. Olive calculates as its green hue. Less pure or less bright colors still experience enhancement, but to a lesser degree.

The simple way to use the calculator is to rotate the dial until you see colors you like appear in the windows. The degree of enhancement of those colors is indicated by the size of the window. Large windows show the most enhanced colors. Smaller windows lesser.

Numbers on the spiral indicate the wavelength relationship of the colors appearing in the windows. The numbers represent wave count and are read going clockwise starting at the bar at the end of the spectrum (at red/purple) on the inner-most row which includes all of your selected colors. For example, if you turn the dial to show orange, greenish-blue, and purple in the large windows, the inner-most row which includes all three, reads 4:5:6. The 4 is aligned with orange, 5 with greenish-blue, and 6 with purple. Had you only been interested in the orange and purple which are showing, you would read their relationship as 2:3. This means that 2 waves of the orange are the same length as 3 waves of the purple. Or, in the orange, greenish-blue, purple combination, 4 waves of orange, 5 waves of the greenish-blue, and 6 waves of the purple are the same length.

It's this frequent alignment of waves which creates enhancement, so the lower the numbers in their relationship, the more frequently the waves align, the more they enhance each other. Had you been interested in the orange-red in the small window, you would find a 15:16 wavelength relationship. That is not a good enhancement.

Whatever color is showing in the 2/4/8/16 window is almost always the most enhanced color in any combination. It is the one which most other wavelengths align with most frequently.

Complements are found in the 3:4 relationship. This is different from the 2:3. Because of the spectrum bar, as you rotate the dial, the same two windows display either 2:3 or 3:4. While the orange and purple are a 2:3, if you rotate the dial the same two windows will show red and bluish-green to be complements with their 3:4 relationship.

As you explore precise complements in this way you should notice that middle green has two complements, both red and purple. In fact, the entire range of magentas between these complements is also the complement to middle green. The reason for this is that our vision doesn't extend all the way to magenta in either direction (far red or far purple). So, to make these colors visible we mix the two complements to green, which we can see.