"Science with Scarlett: What Color Will it Be?"
By Gary Abud Jr.

This book is an activity book so there are not many lesson plans in this teacher resource but it does have some activities to do with Christmas Colors since it is the appropriate time of year to experiment with them which ties in with the color spectrum.
This book also is about how the eyes work to perceive colors using the color spectrum.

Welcome! I'm so very glad you've arrived. My name is Scarlett, age 7.5! I am a kid scientist and, along with my teddy bear assistant, Mr. Bear, I love to do amazing experiments with you—the reader!

Discover something new with Scarlett and her amazing science experiments. Scarlett invites you to mix colorful lights and ask the question, "What color will it be?" all while learning about our amazing gift of sight and how our eyes can see the world in color. Come along on this fun adventure and explore surprising results along the way!

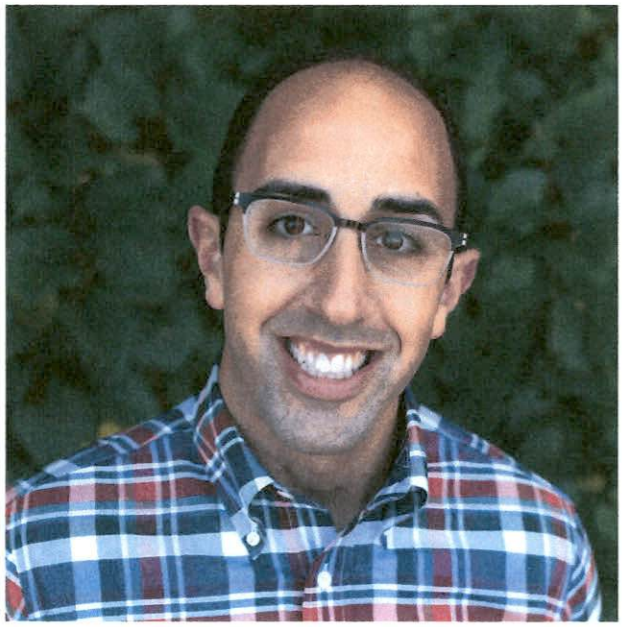
https://sciencewithscarlett.com/ The website has many more activities and videos to use with students at home or at school.

CILC
Center for Interactive Learning and Collaboration

CILC Collaboration Space

About Gary Abud Jr.

Gary Abud Jr. is an award-winning educator and double cornea transplant recipient who, since having his sight restored, was moved to use his teaching gifts to make science fun for kids. He lives with his family near Detroit and writes to inspire children, like his preschool daughter, to love science. Gary is the 2014 recipient of the Michigan Teacher of the Year honor.



On A More Professional Level:

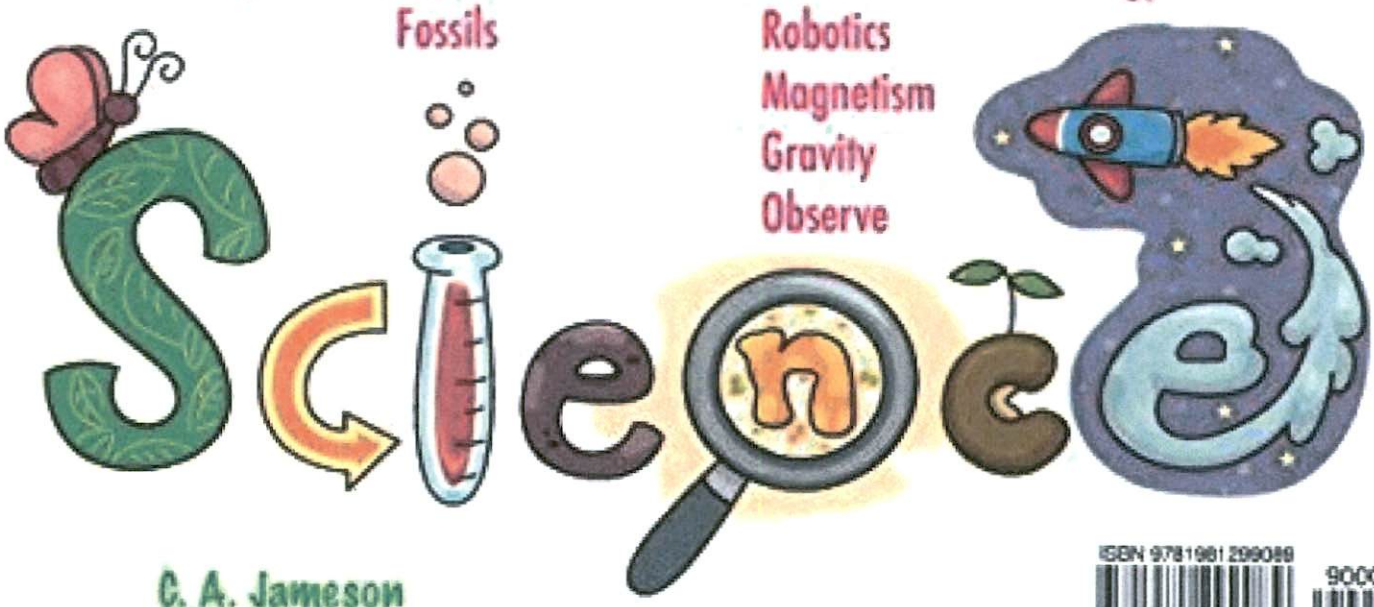
Gary has served schools as a science teacher, principal, curriculum specialist and college instructor. In 2014, he was named Teacher of the Year for the state of Michigan and in 2015 he received the *Bammy Award* for high school teaching. He has spoken at *TEDxDetroit*, the Michigan Governor's Education Summit, and numerous conferences around the country. Gary is an accomplished master teacher whose work has been recognized by the Michigan Governor's Office, U.S. Department of Education, and the White House. In addition to his work with schools, Gary is a member of the Board of Directors at the *Meemic Foundation*, co-founder of *#LoveTeaching Week*, and past co-host of the weekly talk radio program *Teachers of the Year Radio on BAM Radio Network.* He holds a bachelor's degree in philosophy, a master's degree in education, and has completed post-graduate programs in teacher leadership and school administration. In addition to being an award-winning educator, Gary is a double cornea transplant recipient. Since having his sight restored, he was moved to use his teaching gifts to make science fun for kids by creating a children's picture book series, "*Science With Scarlett: What Color Will It Be?*", about a young girl scientist and her teddy bear assistant who do experiments with the reader.

https://sciencewithscarlett.com/

Science With Scarlett is a children's picture book series about a young girl scientist and her teddy bear assistant who do amazing experiments with the reader. Discover something new with Scarlett and her amazing science experiments. Scarlett invites you to mix colorful lights and ask the question, "What color will it be?" all while learning about our amazing gift of sight and how our eyes can see the world in color. The first book in the series is **What Color Will It Be?**

Scarlett Explores Science & Science Words!

Paleontology
Oceanography
Meteorology
Entomology
Chemistry
Medical Science
Aerospace Science
Veterinary Science
Astronomy
Experiment
Fossils
Data
Physics
Astronomer
Scientist
Robotics
Magnetism
Gravity
Observe
Energy
Botany
Zoology

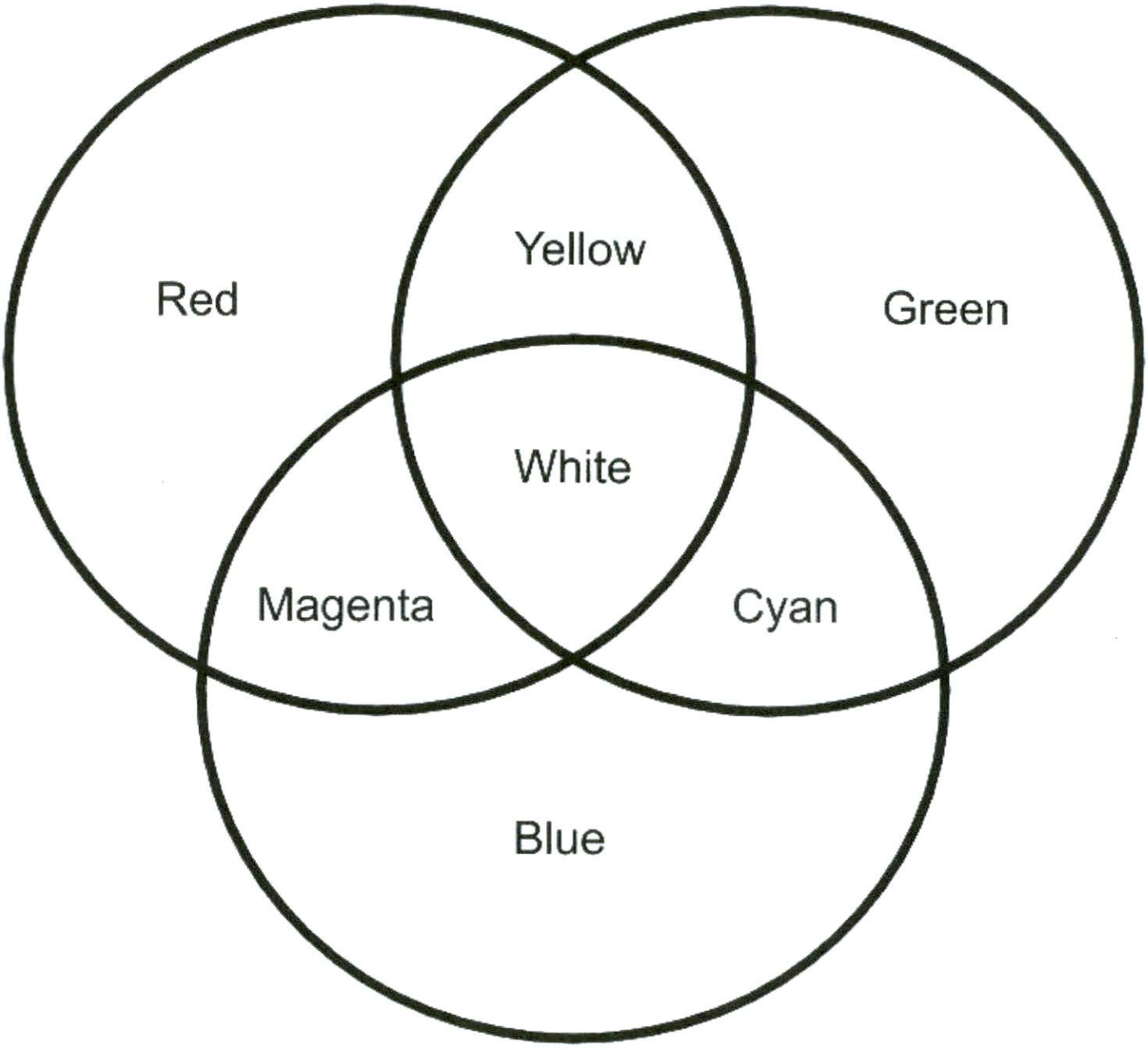


C. A. Jameson
cajameson.com

ISBN 9781981299089

Fun With the Color Mixing of Light

Directions: Lay this sheet flat on a surface or have someone hold it up in front of you. Next, shine each colored flashlight one at a time over the circle with the color name of that flashlight. Then, try shining two flashlights and see the resulting color mixture where the circles overlap. Finally, see if you can shine all the colors together and see what happens in the place where all three circles overlap! (Tip: move the flashlights farther away from the paper to fill more of the circles)



Color Math: Adding and Subtracting Colors of Light

Directions: If you think you've got the color mixing of light down, then you might be ready for a challenge. See if you can predict what colors will result from the color math problems below. Remember that when you see the **+** symbol it tells you to add, or combining colors together, and the **—** symbol tells you to subtract, or take away one color from another. (Tip: you can use your colored flashlights to help, if you need, and see what happens when you add or subtract colored light!)

1. **RED +** _____ **= YELLOW**
2. **CYAN — BLUE =** _____
3. **RED + BLUE =** _____
4. **MAGENTA — RED =** _____
5. **BLUE +** _____ **+ GREEN = WHITE**
6. _____ **— BLUE = YELLOW**
7. **GREEN +** _____ **= CYAN**
8. **WHITE — RED =** _____
9. _____ **— GREEN = RED**
10. **WHITE — GREEN =** _____

Answers: 1) G, 2) G, 3) M, 4) B, 5) R, 6) W, 7) B, 8) C, 9) Y, 10) M

It's time now for us to review what we've learned.
Find out what happened on the pages we've turned.

When light shines on an object like a bear or a ball,
It makes a dark shadow appear on the wall.

Black shadows from white lights, from reds, greens, and blues.
But things changed a bit when the lights came in twos.

Cyan is a mixture of blue light and green,
But mix green with red light and yellow is seen!

Magenta appeared next when blue light met red,
Though some people might call it purple instead.

After two colors, we added one more,
And made something we hadn't thought of before.

Yes, white is produced from a primary three.
The color of each starts with R, G, or B.

The light mixing tests were exciting to do,
So next we decided to try something new.

We asked Mr. Bear to block some of the light,
Which also hid some of the color from sight.

We call them shadows. They're usually black,
But also defined by the colors they lack.

The walls were one color, the shadows were two–
Magenta, cyan, yellow, red, green, and blue.

Like red, green, and blue light can add up to white,
Seeing it's possible with tri-colored sight.

Our eyes can see only three colors, it's true,
With sensors inside them for red, green, and blue.

And with different amounts of each of these colors,
Your eyes tell your brain to see all of the others.

To see all the colors from three tones of light,
Your brain must interpret the colors just right.

That's all for now, kid, you've been quite the guesser.
Now you too can be a rainbow professor!

https://www.crayola.com/for-educators/resources-landing/articles/color-what-is-color.aspx

Color – What is Color?

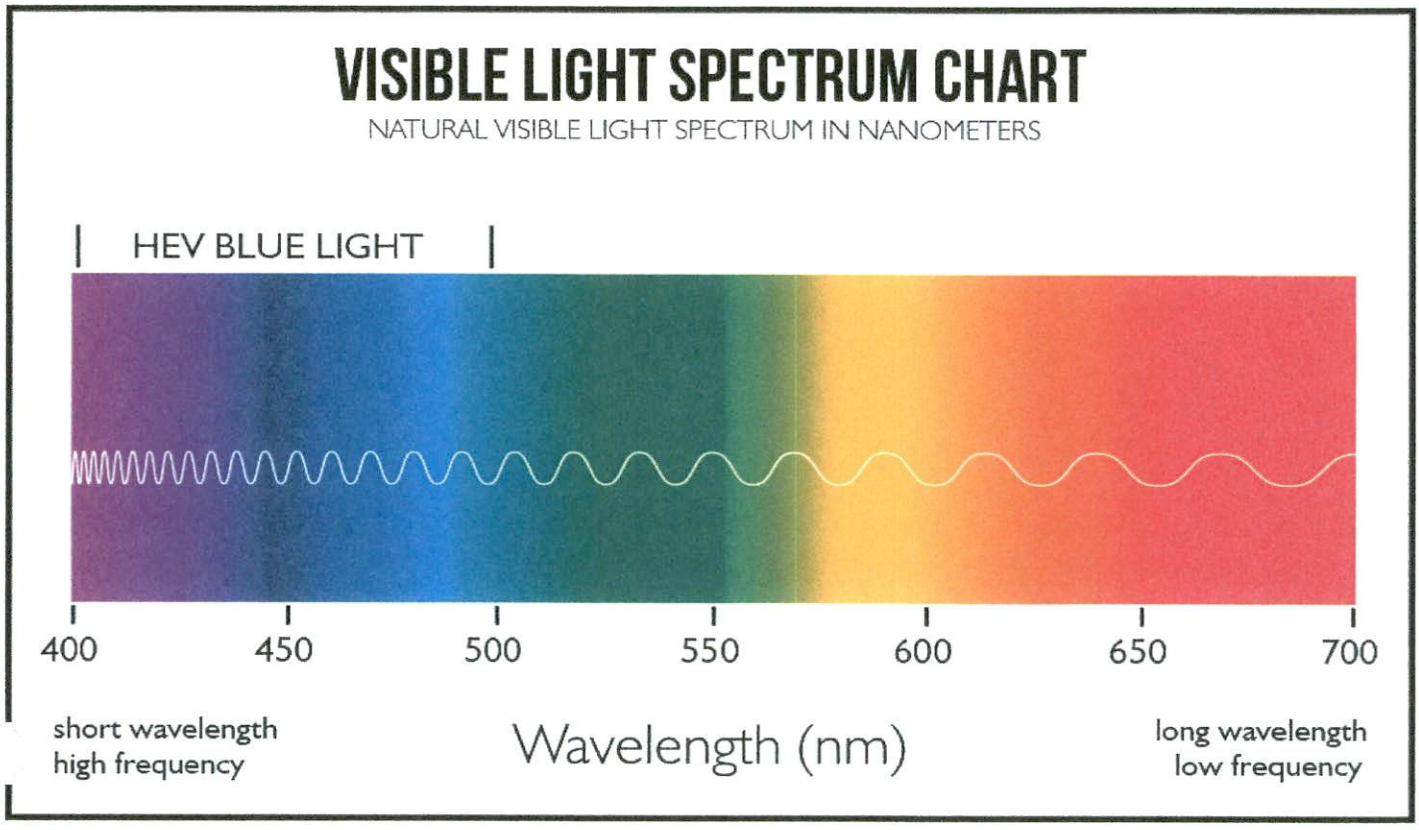
Color is the aspect of things that is caused by differing qualities of light being reflected or emitted by them.

To see color, you have to have light. When light shines on an object some colors bounce off the object and others are absorbed by it. Our eyes only see the colors that are bounced off or reflected.

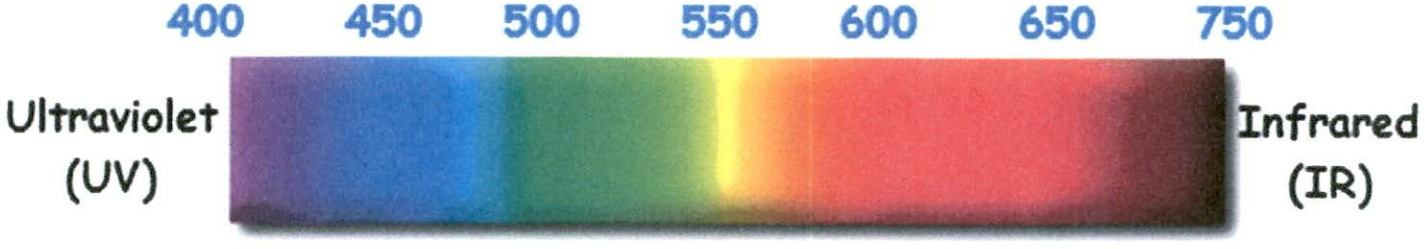
The sun's rays contain all the colors of the rainbow mixed together. This mixture is known as white light. When white light strikes a white crayon or marker barrel, it appears white to us because it absorbs no color and reflects all color equally. A black crayon or marker cap absorbs all colors equally and reflects none, so it looks black to us. While artists consider black a color, scientists do not because black is the absence of all color.

All light rays contain color. Light is made of electromagnetic waves. These waves spread out from any light source, such as the sun. Light waves travel at tremendous speed (186,000 miles or 300,000 kilometers per second). Different colors have different wavelengths, which is the distance between corresponding parts of two of the waves. The longest wavelength of light that humans can see is red. The shortest is violet. Ultraviolet has an even shorter wavelength, but humans cannot see it. Some birds and bees can see ultraviolet light. Infrared has a longer wavelength than red light, and humans cannot see this light but can feel the heat infrared generates.

The chart that came with this webpage is not reader friendly so there are a few other charts to help see the Visible Light with Short and Long Wavelengths.



Visible Spectrum - Wavelengths in nanometers



Violet 400-450nm
Blue 450-500nm
Green 500-570nm

Red 610-700
Orange 590-610
Yellow 570-590

https://www.khanacademy.org/partner-content/exploratorium-ddp/light-and-color/colored-shadows/a/whats-going-on-human-color-perception

What's going on: Human color perception

The retina of the human eye has three receptors for colored light. One type of receptor is most sensitive to red light, one to green light, and one to blue light. With these three color receptors, we are able to perceive more than a million different shades of color.

When a red light, a blue light, and a green light are all shining on the screen, the screen looks white because these three colored lights stimulate all three color receptors on your retinas approximately equally, giving us the sensation of white.

Red, green, and blue are therefore called additive primaries of light.

With these three lights, you can make shadows of seven different colors: blue, red, green, black, cyan (blue-green), magenta (a mixture of blue and red), and yellow (a mixture of red and green).

If you block two of the three lights, you get a shadow of the third color.

Block the red and green lights, for example, and you get a blue shadow.

If you block all three lights, you get a black shadow.

And if you block one of the three lights, you get a shadow whose color is a mixture of the two other colors.

If the blue and green mix, they make cyan; red and blue make magenta; red and green make yellow.

If you turn off the red light, leaving only the blue and green lights on, the lights mix and the screen appears to be cyan, a blue-green color. When you hold the object in front of this cyan screen, you will see two shadows: one blue and one green. In one place the object blocks the light coming from the green bulb and therefore leaves a blue shadow; in another place it blocks the light from the blue bulb to make a green shadow. When you move the object close to the screen you will get a very dark (black) shadow, where the object blocks both lights.

When you turn off the green light, leaving the red and blue lights on, the screen will appear to be magenta, a mixture of red and blue. The shadows will be red and blue. When you turn off the blue light, leaving the red and green lights on, the screen will appear to be yellow. The shadows will be red and green.

It may seem strange that a red light and a green light mix to make yellow light on a white screen. A mixture of red and green light stimulates the red and green receptors on the retina of your eye. Those same receptors are also stimulated by yellow light—that is, by light from the yellow portion of the rainbow. When the red and green receptors in your eye are stimulated, whether by a mixture of red and green light, or by yellow light alone, you will see the color yellow.

Khan Academy

https://99designs.com/blog/tips/the-7-step-guide-to-understanding-color-theory/

The fundamentals of understanding color theory

By Kris Decker, 3 years ago, 9 min read

Color theory is both the science and art of using color. It explains how humans perceive color; and the visual effects of how colors mix, match or contrast with each other. Color theory also involves the messages colors communicate; and the methods used to replicate color.

In color theory, colors are organized on a color wheel and grouped into 3 categories: primary colors, secondary colors and tertiary colors. More on that later.

So why should you care about color theory as an entrepreneur? Why can't you just slap some red on your packaging and be done with it? It worked for Coke, right?

Color theory will help you build your brand. And that will help you get more sales. Let's see how it all works.

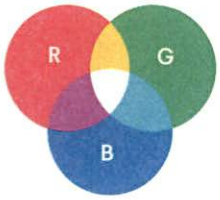
Understanding color

Color is perception. Our eyes see something (the sky, for example), and data sent from our eyes to our brains tells us it's a certain color (blue). Objects reflect light in different combinations of wavelengths. Our brains pick up on those wavelength combinations and translate them into the phenomenon we call color.

When you're strolling down the soft drink aisle scanning the shelves filled with 82 million cans and bottles and trying to find your six-pack of Coke, what do you look for? The scripted logo or that familiar red can?

People decide whether or not they like a product in 90 seconds or less. 90% of that decision is based solely on color. So, a very important part of your branding must focus on color.

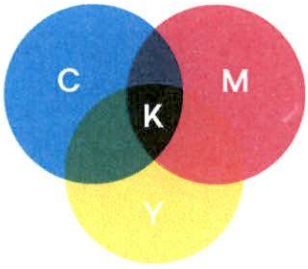
RGB: the additive color mixing model



Humans see colors in light waves. Mixing light—or the **additive color mixing model**—allows you to create colors by mixing red, green and blue light sources of various intensities. The more light you add, the brighter the color mix becomes. If you mix all three colors of light, you get pure, white light.

TVs, screens and projectors use red, green and blue (RGB) as their primary colors, and then mix them together to create other colors.

CMYK: the subtractive color mixing model



Any color you see on a physical surface (paper, signage, packaging, etc.) uses the **subtractive color mixing model**. Most people are more familiar with this color model because it's what we learned in kindergarten when mixing finger paints. In this case, "subtractive" simply refers to the fact that you subtract the light from the paper by adding more color.

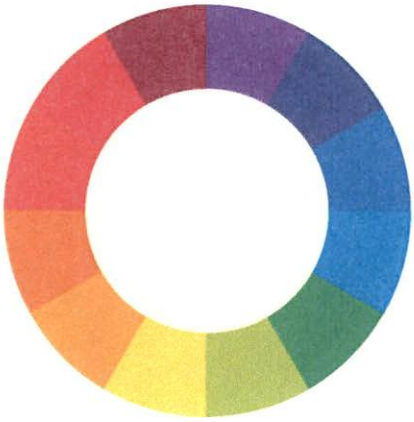
Traditionally, the primary colors used in subtractive process were red, yellow and blue, as these were the colors painters mixed to get all other hues. As color printing emerged, they were subsequently replaced with cyan, magenta, yellow and key/black (CMYK), as this color combo enables printers to produce a wider variety of colors on paper.

Why should you care?

You've decided to print a full-color brochure. If you're investing all that money into your marketing (printing ain't cheap!), you expect your printer is going to get the colors right.

Since printing uses the subtractive color mixing method, getting accurate color reproduction can only be achieved by using CMYK. Using RGB will not only result in inaccurate color, but a big bill from your printer when you're forced to ask them to reprint your entire run.

The color wheel

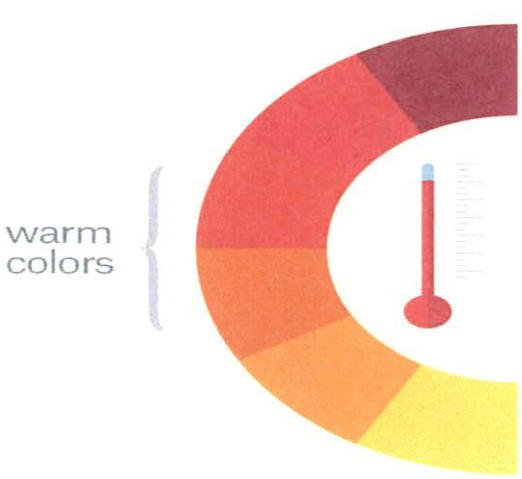


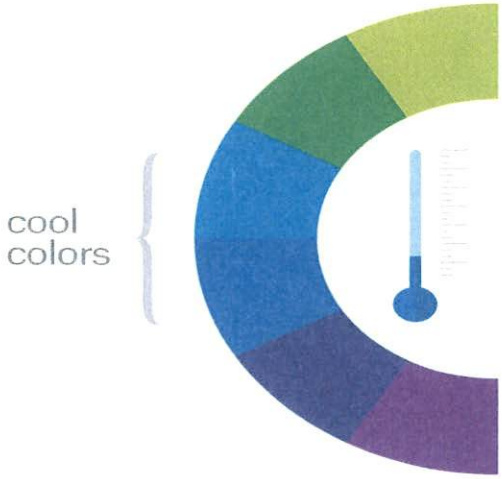
I don't know about you, but when I was a kid, the best part about going back to school in the fall was getting that new, pristine 64-count box of Crayola crayons. The possibilities seemed endless. Until I'd inevitably lose the black crayon.

Understanding the color wheel and color harmonies (what works, what doesn't and how color communicates) is just as exciting as that new box of crayons. No really.

Being able to understand the terms and processes that go along with color will help you knowledgeably communicate your vision with your designer, printer, or even (maybe) an Apple Store Genius.

Color wheel basics





The first color wheel was designed by Sir Isaac Newton in 1666 so it absolutely predates your introduction to it in kindergarten. Artists and designers still use it to develop color harmonies, mixing and palettes.

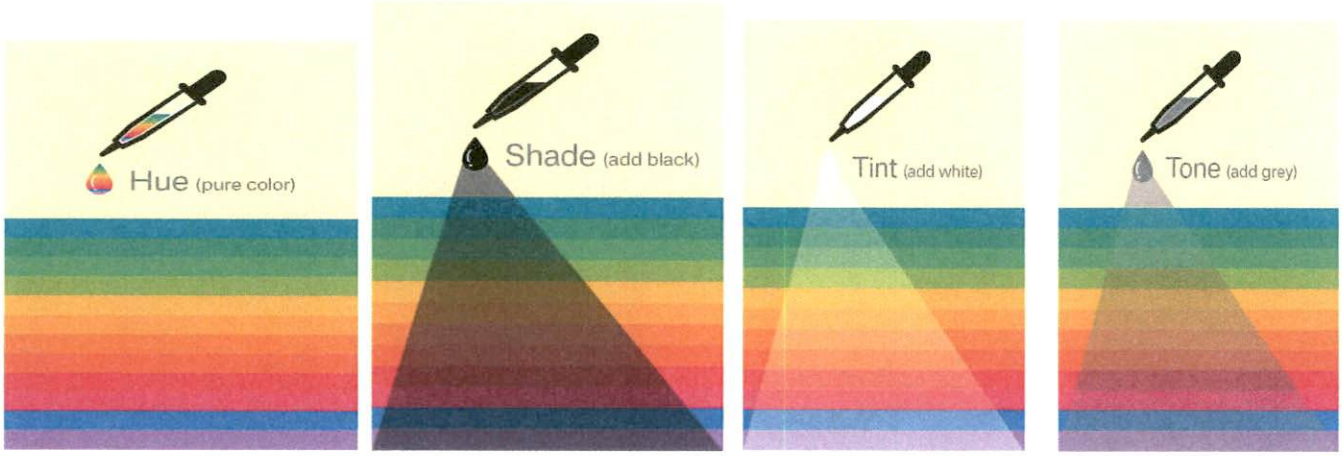
The color wheel consists of three **primary colors** (red, yellow, blue), three **secondary colors** (colors created when primary colors are mixed: green, orange, purple) and six **tertiary colors** (colors made from primary and secondary colors, such as blue-green or red-violet).

Draw a line through the center of the wheel, and you'll separate the **warm colors** 'reds, oranges, yellows) from **cool colors** (blues, greens, purples).

Warm colors are generally associated with energy, brightness, and action, whereas cool colors are often identified with calm, peace, and serenity.

When you recognize that color has a temperature, you can understand how choosing all warm or all cool colors in a logo or on your website can impact your message.

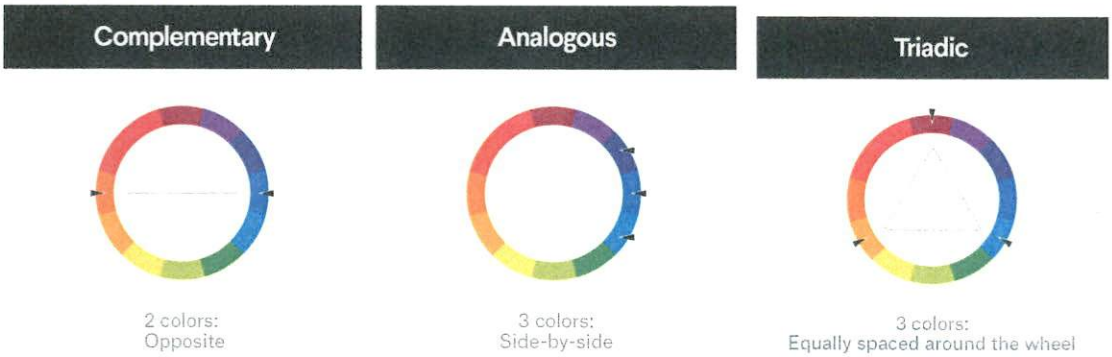
Hue, shade, tint and tone



Let's go back to that 64-pack of crayons from our first day of school. (Remember "raw umber"? What is an umber anyway, and is it actually better raw than cooked?) Anyway, you might be wondering, how we got from the twelve colors on our original color wheel to all those crayons? That's where tints, shades, and tones come in.

Simply put, tints, tones and shades are variations of **hues**, or colors, on the color wheel. A **tint** is a hue to which white has been added. For example, red + white = pink. A **shade** is a hue to which black has been added. For example, red + black = burgundy. Finally, a **tone** is a color to which black and white (or grey) have been added. This darkens the original hue while making the color appear more subtle and less intense.

Color schemes



Let's talk schemes... (And not the kind that cartoon villains concoct. Bwahaha!) We're talking color schemes. Using the color wheel, designers develop a color scheme for marketing materials.

Complementary colors

Complementary colors are opposites on the color wheel—red and green, for example.

Logo design by Wiell for Pepper Powered

Because there's a sharp contrast between the two colors, they can really make imagery pop, but overusing them can get tiresome. Think any shopping mall in December. That being said, using a complementary color scheme in your business marketing offers sharp contrast and clear differentiation between images.

Analogous colors

Analogous colors sit next to one another on the color wheel—red, orange and yellow, for example. When creating an analogous color scheme, one color will dominate, one will support and another will accent. In business, analogous color schemes are not only pleasing to the eye, but can effectively instruct the consumer where and how to take action.

The Tostitos website uses an analogous color scheme. Notice the bright orange navigation bar draws the eye to explore the site, and accent-colored links at the bottom direct hungry consumers with the munchies to "Buy Online."

Triadic colors

Triadic colors are evenly spaced around the color wheel and tend to be very bright and dynamic.

Using a triadic color scheme in your marketing creates visual contrast and harmony simultaneously, making each item stand out while making the overall image pop. Burger King uses this color scheme quite successfully. Hey, is it lunchtime yet?

HAVE IT YOUR WAY®

But really, why should you care about color theory?

Two words: branding and marketing.

No wait, three words: branding, marketing and sales.

With this basic knowledge about colors and color schemes, you're prepared to make effective branding decisions. Like what color your logo should be. Or the emotions that colors evoke in a consumer and the psychology behind color choices on your website.

Not only can knowledge of color theory guide you in your own marketing, it can also help you better understand what your competition is doing.

In a side-by-side comparison of three law firm web pages, you'll notice a variety of analogous color schemes. Blue is generally associated with dependability, brown with masculinity, and yellow with competence and happiness. All of these are positive associations in a field that stereotypically has negative connotations, such as dishonesty or aggression.

Making your brand stand out and appeal to your target, plus understanding that poor colors can mean poor sales—*that's* why you should care about color theory.

This article was originally written by Peter Vukovic and published in 2012. The current version has been updated with new information and examples.

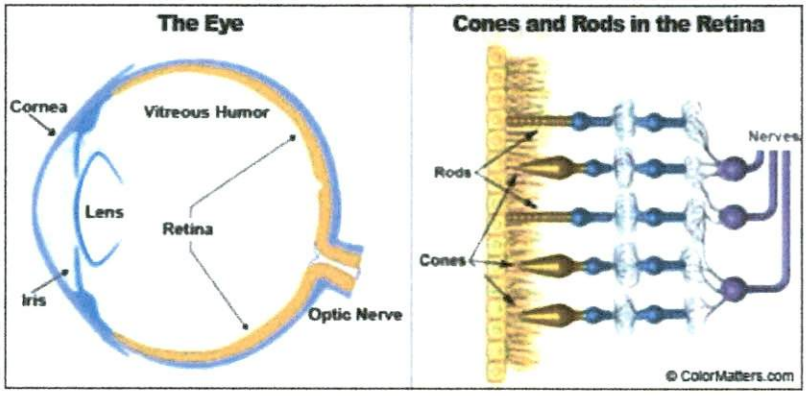
https://99designs.com/blog/tips/the-7-step-guide-to-understanding-color-theory/

99designs

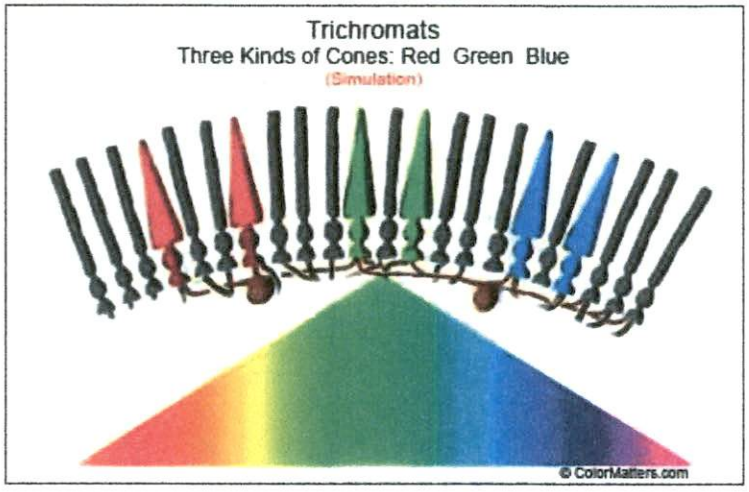
Look Inside the Eye

Color vision can be defined by what kind of color-detecting equipment exists inside the eye of a human or non-human animal. Some species see no colors, some see a few colors, some see all colors, and some see colors that are not visible to the typical human eye.

The color-detecting equipment inside an eye is called a "cone."
(The rods are for night vision.)



The number of visible colors is defined by the kinds of cones in the eye.



Trichromats

Humans have three kinds of color receptor cells - or "cones" - in their eyes. Each type of cone contains a different visual pigment. These three cone types are called "red", "green" and "blue." Therefore we are "trichromats" (tri = 3, chroma = color).

All hues can be produced by mixing red, green and blue light. This is how a color television set works; a mixture of these three wavelengths of color produces several million visible colors.)

Tricromats

(with a special sensitivity to ultraviolet)

Some animals - for example bees - have three types of cones. Two of the cones are sensitive to "human visible" wavelengths. The third cone is sensitive to colors in the ultraviolet range of the spectrum. This cone enables them to see colors that humans can't see.

They also perceive human-visible spectra in different hues than those that humans experience. Source (http://www.bio.bris.ac.uk/research/vision/4d.htm)

Tetrachromats

Most bird species (that have been studied) have at least four types of cones. They are "tetrachromats." Recent studies have confirmed tetrachromacy in some fish and turtles.

Perhaps it is mammals, including humans, that have poor color vision! Source (http://www.bio.bris.ac.uk/research/vision/4d.htm)

Tetrachromats?

It has been suggested that some women are also tetrachromats One study suggested that 2-3% of the world's women may have the kind of fourth cone that gives a significant increase in color differentiation. Source (http://en.wikipedia.org/wiki/Tetrachromat)

Another thing to considered: Some data suggests that the architecture of the human visual system (as well as that of many animals) is really tetrachromatic - but that this capacity is blocked. Source (http://www.4colorvision.com/files/tetrachromat.htm)

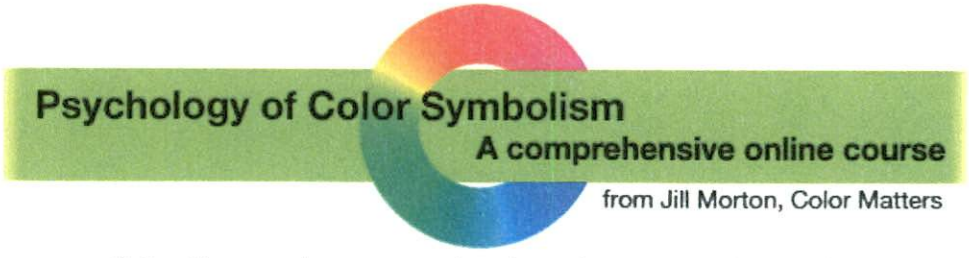
Many animals have only two kinds of cones in their eyes. They are known as "dichromats." It's worth noting that the color-sensing pigment in these cones may be weak. Therefore, an animal - for example a dog - probably sees very weak colors.

Dichromats

For more detailed information visit
Neuroscience for Kids - Color Vision (http://faculty.washington.edu/chudler/eyecol.html)

Purple is the hardest color for the eye to discriminate. Some say it's a supernatural color. Others say it's really just a happy color. Find out more at Color Matters: **Purple (/the-meanings-of-colors/purple)**


(/purple)



(http://www.colorcom.com/seminars/e-courses-about-color)

Fun Color Matters

Color Matters for Kids <

Fun Color Facts <

The Color Police <

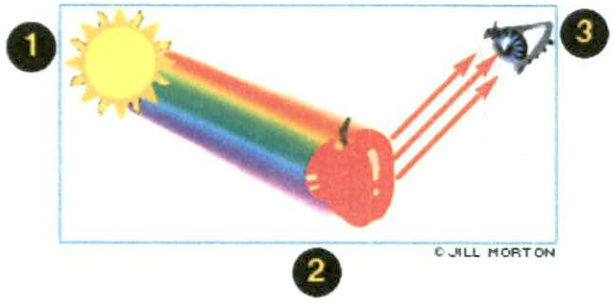
Color Connections

Global Color Survey (http://www.colorcom.com/global-color-survey)

Color Matters Blog (/color-matters-blog)

How the Eye Sees Color

Color originates in light. Sunlight, as we perceive it, is colorless. In reality, a rainbow is testimony to the fact that all the colors of the spectrum are present in white light. As illustrated in the diagram below, light goes from the source (the sun) to the object (the apple), and finally to the detector (the eye and brain).



1. All the "invisible" colors of sunlight shine on the apple.

2. The surface of a red apple absorbs all the colored light rays, except for those corresponding to red, and reflects this color to the human eye.

3. The eye receives the reflected red light and sends a message to the brain.

The most technically accurate definition of color is:
"Color is the visual effect that is caused by the spectral composition of the light emitted, transmitted, or reflected by objects."

Legal permission was granted for this page to be translated into Russion to spread the good news about color around the globe. See How the Eye Sees Color in Russian. (http://webhostinggeeks.com/science/colormatters-seecolor-uk)

Factoids Part 1

Explore the world of color with these amazing "factoids" about color. You'll find unusual snippets of information from the world of nature, vision, psychology, business, and from all dimensions of our lives.

Color Vision

Humans, apes, most old world monkeys, ground squirrels, and many species of fish, birds, and insects have well-developed color vision. However, it's worth noting that 7 or 8 percent of human males are relatively or completely deficient in color vision.

Humans with the most common form of color-blindness and mammals with poor color vision are unable to differentiate between reds and greens. They see the world as a blend of blues, yellows, and greys.

Mammals with limited color vision or none at all include mice, rats, rabbits, cats, and dogs. Nocturnal animals - such as foxes, owls, skunks, and raccoons - whose vision is specialized for dim light seldom have good color vision. By comparison, humans are color-blind in dim light.

Source: David Hubel's Eye Brain and Vision (http://hubel.med.harvard.edu/)

More info about color vision -> Color Vision for Mice (/color-and-vision/color-vision-for-mice)

Factoids Part 3

More amazing facts about color. You'll find unusual snippets of information from the world of nature, vision, psychology, science, business, brands, and the food we eat.

The colors of the Olympic logo

The official Olympic logo was created by Baron Pierre de Coubertin in 1913. It consists of five interlacing rings of blue, yellow, black, green, and red. At least one of these colors is found in the flag of every nation. According to the Olympic Charter, the five-ringed symbol "represents the union of the five continents and the meeting of athletes from throughout the world at the Olympic Games: Europe, Asia, Africa, the Americas and Oceania. On the other hand, Pierre de Coubertin never said nor wrote that the colors of the rings were linked with the different continents.

(http://www.colorcom.com/research/demographic-research-about-color)

Factoids Part 4

More amazing facts about color. You'll find unusual snippets of information from the world of nature, vision, psychology, business, and even the food we eat.

Burple?

According to poetry experts, nothing rhymes with either of the words "orange" or "purple." You are welcome to prove them wrong.

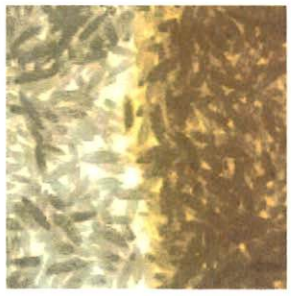
Source
(http://wiki.answers.com/Q/What_words_do_not_have_rhymes)

Pink Fish (http://www.domain.com/)

Fish in the North Sea have sunburned skin and blistering as a result of the thinning ozone layer. British researchers report that young fish are the most affected due to their lack of scales that would otherwise deflect the sun's harmful rays. Ian McFadzen, a research ecotoxicologist with England's Plymouth Marine Laboratory said the fish have no protection against the rays and that they have not needed to evolve one until man influenced the atmosphere.
What's next?

Source #1 (http://www.truehealth.org/climnw06.html)
Source #2 (http://www.independent.co.uk/environment/north-sea-cod-and-sole-stricken-by-sunburn-621944.html)

Golden rice could save children's lives (http://www.soawe.com/)



Scientists in Switzerland have created a genetically engineered strain of rice that could save millions of children's lives. Unlike white rice, golden rice produces beta carotene, an important source of Vitamin A, which is crucial for resistance to disease and healthy vision. Approximately 124 million children in the world don't get enough Vitamin A. Of these, about a half a million go blind and 1-2 million die due to lack of Vitamin A. Note: Dr. Ingo Potrykus, the German is the inventor of the golden rice.

In 2005 a new variety called Golden Rice 2 was announced which produces up to 23 times more beta-carotene than the original variety of golden rice. Neither variety is currently available for human consumption. Although golden rice was developed as a humanitarian tool, it has met with significant opposition from environmental and anti-globalization activists.

Source- Golden Rice (http://www.soawe.com/time/?tag=Golden-rice-vitamin-a)
Source (http://en.wikipedia.org/wiki/Golden_rice)- Wikipedia

The next time you're in pain, don't pop a pill. Look at a plant instead. (https://www.domain.com/)

Research conducted at Washington State University and published in the journal Horttechology (correct spelling) suggests that people in rooms with a lot of greenery can tolerate more physical pain that those in surroundings without any plants. 200 people were tested for how long they could keep their hands submerged in ice water. The findings reinforce previous studies that found that people work more efficiently when they can see houseplants, and patients recover more quickly from surgery and use fewer drugs when they are in a room with a green view.

Another benefit:
Visual exposure to a plant setting has produced significant recovery from stress within five minutes while enhancing productivity by 12 percent, according to a study by Texas A&M University and Washington State University (WSU).

Source
(http://findarticles.com/p/articles/mi_qa5359/is_200205/ai_n21321297/)

The color of peace, stability and prosperity - A white elephant (/).

In 2001, a rare white elephant was discovered in Myanmar during a recent roundup of of wild beasts. He has pearly white eyes and an a whitish-light pink skin color. True albino elephants are extremely rare, with only one known to be living in Laos.

In 2010, another white elephant was captured in Burma.

*** Most white elephants are only nominally white - they often look reddish-brown in the sun, and light pink when wet.

Historically, this mammal was the symbol of kingship in Thailand, Laos, and Myanmar (formerly Burma). In Southeast Asia,today, it is believed that the white elephant brings peace, stability and prosperity.

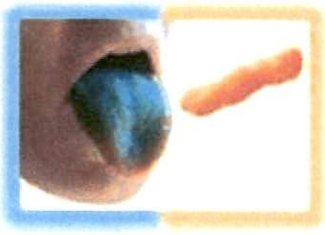
Source (http://www.bbc.co.uk/news/10452174)

The American Flag

Although there is no official record of the meaning of the colors of the U.S. flag, in 1782, the Congress of the Confederation chose these same colors for the Great Seal of the United States and listed their meaning as follows: white to mean purity and innocence, red for valor and hardiness, and blue for vigilance, perseverance, and justice.

Legend has it that George Washington interpreted the elements of the flag as follows: the stars were taken from the sky, the red from the British colors, and the white stripes signified the secession from the home country. Others say that the stripes symbolize rays of light emanating from the sun.

Tint your tongue blue! How did they do that?



Frito-Lay's "Mystery Colorz Snack" is a new breed of Cheetos, (the crunchy neon orange American snack food). They change from neon-orange in your hand, to blue or green in your mouth. Instead of ending up with greasy orange lips, you get a bright blue or green tongue.

How did they do it? It's a water-soluble "FDA approved" additive that activates your saliva, which in turn changes the color of your tongue.
Source (http://www.chacha.com/question/how-did-cheetos-make-their-cheese-turn-your-tongue-blue)

(http://www.colorcom.com)

Fun Color Matters

Color Matters for Kids

Fun Color Facts

- Factoids Part 1 (/fun-color-facts/factoids-part-1)
- Factoids Part 2 (/fun-color-facts/factoids-part-2)
- Factoids Part 3 (/fun-color-facts/factoids-part-3)
- Factoids Part 4 (/fun-color-facts/factoids-part-4)
- Factoids Part 5 (/fun-color-facts/factoids-part-5)

The Color Police

Color Connections

Global Color Survey (http://www.colorcom.com/global-color-survey)

Factoids Part 5

Factoids from the past. They're oldies but goodies and still true

Blue blood a lifesaver

The sapphire blue blood of the horseshoe crab is the world's only known substance that can be used to test for contaminants in every drug and every vaccine in the world. The crabs are "bled" by a fast and painless process. 24 hours later, they are returned to the ocean."LAL," the protein ingredient in the crab's blood, is dropped into a new batch of drugs. If the mixture is contaminated, it clots instantly. The same process is used for every intravenous substance and artificial limb in the U.S., as required by the FDA.Prior to the discovery of "LAL," drugs were tested for contaminants by injecting them into a rabbit. If the rabbit died or got sick, the lab disposed of the drug. Lab technician, Jay Nichols, sums up the horseshoe crab's magic, "No other animal contributes so much to science without dying in the process."

Source: "Living fossil's blue blood a lifesaver" by Helen O'Neill, Associated Press, The Honolulu Star Bulletin, A--12, September 7, 2000

Contact Lens Alert (https://www.domain.com/)

After receiving reports that some teenagers in the U.S. are tinting their contact lens with food coloring, The American Optometric Association has issued an alert. They warn that this can be very dangerous. Some people can have serious allergic reactions to the food coloring. Also, since the dye is not sterile, this could lead to eye infections. Furthermore, dark colors may impair vision.

"Food -colored contacts? Don't even think about it"" the Honolulu Advertiser, Ohana, p.1, June 11, 2000

What happens when baboons eat pink flamingoes?

A new food source is changing the color of baboons near Kenya's Lake Bogoria. The primates have been dining on pink flamingoes. More than a million of these birds have recently arrived at the lake to feast on the lake's protein rich rotifers and blue-green algae. The dead birds are an easy food source for the primates. Researchers have reported that the monkeys' new taste for flamingoes is turning their gray coats into a tawny shade.

Earth Environment Service as reported in "Earthweek," the Honolulu Advertiser, May 21, 2000

What was the date of the first colored cellular phone?

Nokia, the Finnish telecommunications giant, was the first to offer cell phones in colors in 1992. Today, electronic devices are trading in their muted hues for something more vivid and vibrant. "What's your favorite color?" is going to be one of the most important questions for consumer PC buyers, states Steve Jobs.

Honolulu Star Bulletin, March 28, 2000

Black Tulips -The elusive "Holy Grail" of the tulip world

The quest for the valuable "black tulip" has persisted since 1850 when Alexander Dumas (author of the Three Musketeers) wrote his novel, "The Black Tulip." No truly black tulip exists to this day. The reason: It's impossible.

Dutch hybridizers are still working on their own specialty - the elusive black tulip. Frans Roozen of the International Flower Bulb Center in the Netherlands explains: "To be truly black, the color would have to be absolutely devoid of any hues or overtones of other colors." In nature this happens only in death.

Nevertheless, many tulips are sold as black tulips since colors are always perceived in relationship to other colors. When dark purple tulips are placed against a green background in bright sunlight, the effect is black. (Color Matters suggests that you get out your crayons and try this!)

Source:
"Black tulips remain an elusive goal" Knight Ridder News Service - Honolulu Star Bulletin January, 2000

Commentary from some color pros:

All tulips are black in the dark

(https://www.domain.com/)

In the absence of any reflection at all, by definition there would be no measurable light coming from the tulip.

If the tulip was surrounded by other black tulips in a black room with one light, then colors from around the room or object would not play with our eyes, but we would not see any tulips and there would be no reflected light, and we wouldn't see anything.

But, use infrared film, and you will see the black tulips painted red. So, maybe it is not the question of 'has there ever been a black tulip,' but could we even SEE a black tulip if there was one. There would be no tulip, only a hole in space (a black hole!) consuming all visible light that reaches it. So, how could we even know if there was a perfectly black tulip? Answer: find a black hole that shows up on infrared film as a tulip, that wasn't visible otherwise.

Larry MacDonald

Death by Cyan

The color we know as cyan was once made from cornflower petals and was known as "corn blue." In the late nineteenth century the poisonous chemical cyanide was used to create "corn blue" dyes and pigments for commercial purposes. After a series of "cyan poisoning" deaths occurred in the silk flower industry, the color was discontinued. The name "cyan" was revived when color photography became popular. The traditional art world shunned these new technical artists of photography. Consequently, photographers used this color term to separate themselves from the rest of the artists.

Today, the term cyan has been revived by the computer artists. Once again, perhaps this is a form of "technical" upmanship since the art world first rejected computer generated art.

Source: Odeda Rosenthal, Inter-Society Color Counciil News, July/August, 1999 p. 5

Mellow yellow ?

The color yellow may be taking over the marketing world. Research from Pantone reveals that a yellow background with black type is the the best color combination for printed material. Tests show that this combination scores the hightest in memory retention and in legibility. It's also the color that the human eye notices first. Move over Big Blue?

The Costco Connection, December, 1999

Natural Blondes Are an Endangered Species (http://www.blonde.com/)

A new book states that natural blondes rely on a recessive gene which is being dominated by darker-haired genes. Kathy Phillips, author of "The Vogue Book of Blondes," explains that migration and open marriages have increased in Scandinavia and Northern Europe, the epicenters of the blond population. Experts point to Africa for the next population expansion. These people will travel and their darker genes will absorb the lighter gene pool.

Phillips predicts that by the time this happens, genetic engineering will allow us to tweak our genes and go blonde anyway.

Source "Blond Gene is Dying Out" by Lyndsay Griffiths - Reuters, Honolulu Star Bulletin, October 7, 1999

Black rainbow sighting!

(https://www.donaldson.com/)

Kahuku, Hawaii
Two fisherman reported seeing what looked like a black rainbow arching from the mountain to the ocean at 9:00 P.M. at night

Can a black rainbow occur at night ?

"Moonbows" coincide with a full moon and are the result of light refrating through water droplets in the atmosphere. If the water vapor is in the right place and if the sky is clear, a bright full moon acts like the sun and you will see a rainbow at night.

The rainbow may appear black, but all the colors are there. "It's just that there's no blue sky to paint it against."

Note: This is not a common occurence. The clear skies and moist air of the Hawaiian Islands make this location one of the few places where a "moonbow" can be seen.

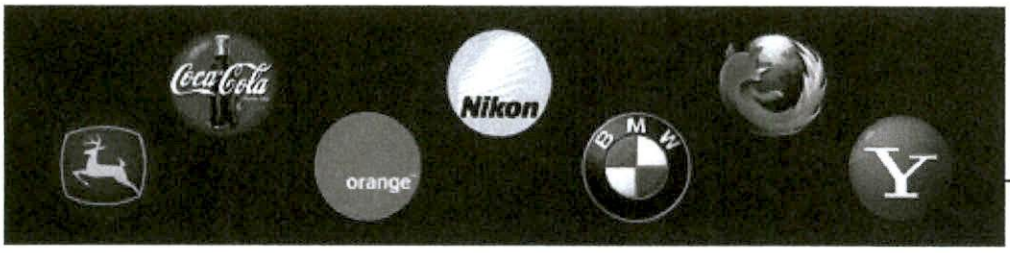
"Moonbows only appear to be black," June Watanabe, Honolulu Star Bulletin, August 17, 1999

Green Mice (http://www.dmaseo.com/)

Scientists reported that feeding mice a special diet of Christmas tree mulch caused the mice to turn green. Well....not exactly. It's not what the mice ate that caused some mice to turn green. They were born with a green gene from a jellyfish. The University of Hawaii research team that cloned mice (Yanagimachi, Perry and Wakayama) has developed a new method of transferring genetic information (DNA) from one organism to another.

The technique called "Honolulu transgenesis" is reported in the May 14 edition of Science.

"UH Green Mice: A medical promise" - by Helen Altonn, Honolulu Star Bulletin, May 13, 1999



(http://www.colorcom.com)

Color Consultation for Branding & Marketing
COLORCOM

Fall presents orange ad the new "in" color (1999)

The fall color of "Sunkist" orange is popping up everywhere in fashion. From designer-prophet Helmut Lang's fall collection to Gap vests and Absolut Vodka.*

Why orange? Perhaps it all started with the acceptance of khaki and grey as the new neutrals. Also, one might speculate that orange follows the acceptance of pink in the spring.

*The author of ColorMatters notes that Apple's dazzling new iBook laptop computer is offered in only two colors, blue and orange!

The Dallas Morning News, as reported in the Honolulu Advertiser September 7, 1999

Baa baa blue sheep, have you any wool?

A farmer in Adelaide Australia announced that she has produced the first flock of blue sheep without using dye. The owner, Nancy Follett of Sleaford Bay, said she has bred 100 sheep with fleece ranging from light blue to navy. It took 25 years and several generations of breeding to get a brilliant blue color.

Fool nighttime bugs

If it's summer in your part of the world, use this tip the next time you barbecue or eat outdoors. Place a bug repellent yellow fluorescent light bulb over your table. Place a standard fluorescent bulb at the opposite end of your dining or patio area. Bugs can't see yellow! They'll be drawn to the whiter light away from your table.

Color Revolution
Purple asparagus and red corn?

Brightly colored vegetables are now available in W. Atlee & Burpee's seed catalogue. The red corn is appropriately named "Ruby Queen" and the yellow carrots (absolutely no trace of orange) are named "Sweet Sunshine." How about some "Purple Passion" asparagus? Burpee's phone number is 1-800-888-1447 .

"Vegetables now come brightly colored", Honolulu Star Bulletin April 25, 1999

How do chickens with male hormones eat their colored food?

When chickens were fed male hormones, they pecked at their colored food in different ways. They ate all the red until it was gone, then all the yellow. The other chickens (no male hormones) ate all the different colored food in no order.

Does this provide a clue to multi-tasking abilities of the male species? Also, could this also explain why men hate shopping?

It all comes back to nerve fibers and how they relate to visual stimulation.

Men tend to focus on singular tasks, such as reading the newspaper, and get irritated when interrupted. Wives can't understand why men can't do two things at once.

"Men are from caves, not Mars," by Janet L. Martineau., Newhouse News Service, Honolulu Star Bulletin
February 8, 1999

Editor's note, Feb. 2011: We tried to find more information about this study and could not verify it other than the citation about the article in the Honolulu newspaper.

https://www.herecomethegirlsblog.com/2013/11/12/christmas-bulbs-sun-catchers.html

HERE COME THE GIRLS

CHRISTMAS BULBS SUN CATCHER

Posted by Rebecca | Nov 12, 2013 | Christmas, Crafts for kids | 0 |

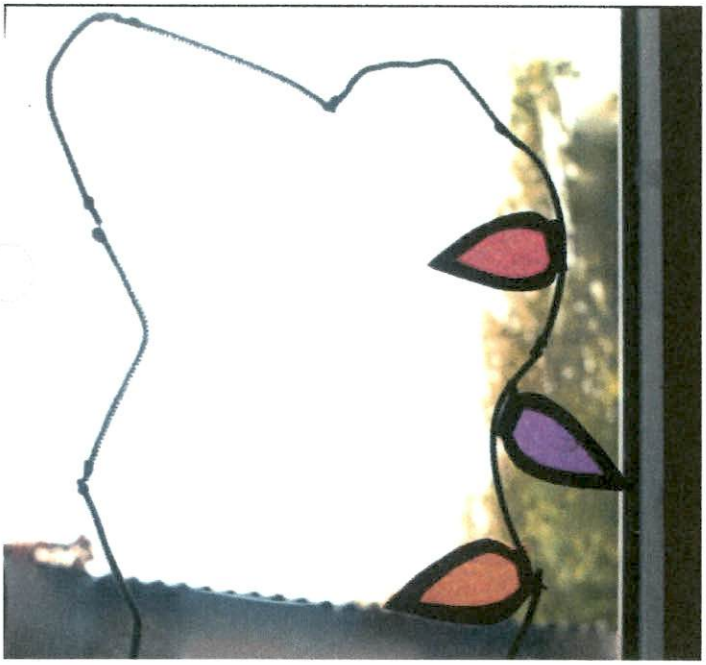
This is such a great kids craft mainly because it is up on the window and can be seen and enjoyed but then you can change it easily for something else. I thought Christmas bulbs would work well because they are so colorful and cheery and the light coming through would make them look realistic.

This doesn't take many materials at all.

- craft foam
- tissue paper
- pipe cleaners

You also need scissors glue and blue tack.
String or suction cups, depends on how you want to hang them up in the window.

Cut the light bulbs out. The bulb is a fairly simple shape to cut. Then glue the back and stick a piece of tissue paper on it and then cut round it.



You may not want to put sticky tape on the windows to stick the sun catcher to the window so maybe use black pipe cleaners stuck on with blue tack. This is good as long as you cover up the edge of the pipe cleaners with one of the bulbs and hope they won't fall off. You can also use a white board marker to draw the string. Using string with suction cups to hang on the window will also work.

This activity with sun catchers is a way for students to experiment and play with Christmas colors. Hanging them to shine bright in the window is fun to watch the colors change as the sun changes during the day.

Each child can make one or two and you would have a whole display of lights at the end.

Students can use their imagination with colors, be creative and use this technique for any time of year to play with colors for any season or holiday.

https://www.herecomethegirlsblog.com/2013/11/12/christmas-bulbs-sun-catchers.html

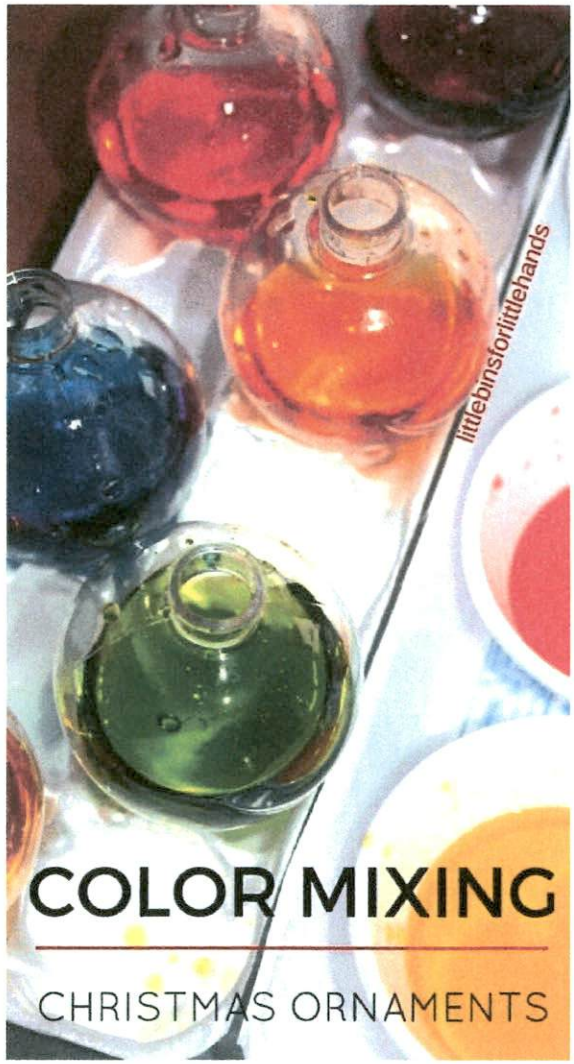
https://littlebinsforlittlehands.com/christmas-color-mixing-hands-play-learning/

Simple Science and STEM for Every Day

CHRISTMAS COLOR MIXING PLASTIC ORNAMENTS

November 17, 2014 by littlebins

Love giving simple learning activities fun for the seasons or holidays? This Christmas color mixing is just that! So easy to set up and fun for kids to do. Learn through play and experimentation this holiday season with Christmas color mixing in plastic reusable ornaments!



CHRISTMAS COLOR MIXING

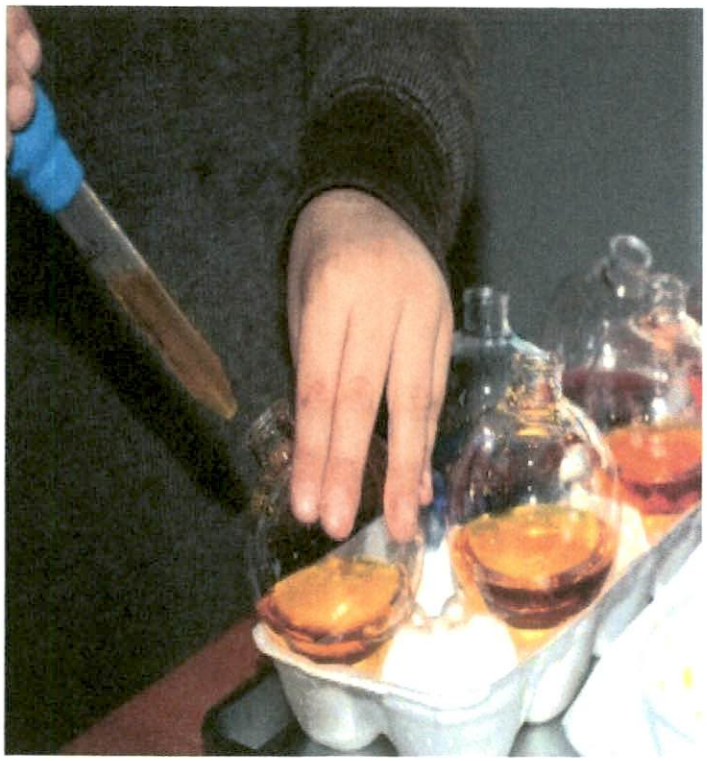
Supplies Needed:

- EGG CARTON TO HOLD UP ORNAMENTS
- PLASTIC GLOBE ORNAMENTS {TOPS REMOVED}
- WATER
- FOOD COLORING
- EYE DROPPER
- SMALL CUPS TO HOLD PRIMARY COLORS

For this simple Christmas color mixing activity, use 6 plastic globe ornaments with removable tops. Set them up in an egg carton so they won't roll around. Use three small plastic containers to hold the three primary colors: red, yellow, and blue. Set those in the back of the egg container. Place everything on a cookie sheet and put out an eye dropper.

Not only does this Christmas color mixing activity show how colors mix, but it also uses great fine motor skills! Using the eye dropper and steadying the ornaments is big work for little hands!

We mixed the traditional colors in the globe ornaments by first filling in our primary colors, red, yellow and blue. Next we chose two colors to combine and guessed the results! You can go even further and let your child explore dumping them into one another to make "new" colors. You may already know what happens when you combine too many colors, but let your child figure it out himself! That's the wonder of childhood.



https://littlebinsforlittlehands.com/diy-christmas-science-light-box-color-mixing/

Simple Science and STEM for Every Day
October 24, 2016 by littlebins

DIY CHRISTMAS SCIENCE LIGHT BOX COLOR MIXING

So how about putting together a super simple **Christmas science light box** with a strand of Christmas lights! We used our mini light box for a little color mixing science with the glow of a simple strand of battery operated lights.

CHRISTMAS SCIENCE LIGHT BOX

I really like to put together easy science. You know the science you can do when you have an afternoon or morning or stuck inside day to fill and you don't know what to do! So you do some science because you actually have what you need without having to leave the house or place a lengthy order of supplies first. This is it and perfect for the holiday season. Our DIY mini light box with Christmas lights is perfect for Christmas science and sensory play. Light box play like these ideas, is pretty cool.

SUPPLIES

- Clear storage container {clear lid too}
- Battery Operated Christmas Lights
- You can use one small strand of lights from the dollar store and a small storage container
- Water
- Food Coloring
- Eyedropper

SET UP

Put lights in box, turn them on, and close the lid! A super simple light box. For our color mixing science using the light box, I set out small clear cups and one large clear cup for water. Set out food coloring and an eyedropper.

Now just let your kids have fun with color mixing on their new light box! Color mixing science is great for young kids.

Eyedroppers are terrific for adding fine motor practice to science experiments.

This Christmas science light box is also great visual sensory play for hands on learning. Learning about the 5 senses is also an excellent science activity for young kids and this one sure does explore the sense of sight!

Cool science on a light box makes learning fun and engages curious kids.