

## SESSION 3

# Color Magic

## Understanding Hues and Moods

**KEY IDEA**

Color is a **system of relationships**, and what a color means depends on who is looking, what is around it, and where it will be printed.



INSTRUCTOR

Chase Ayres

### SESSION 3

# What You'll Be Able to Do

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Five things you should be able to do by the end of the hour.

- ✔ Explain **hue, saturation and value**, and describe tint, shade and tone.
- ✔ Identify the **six color harmony schemes** and say when each one is the right choice.
- ✔ Evaluate a color for brand fit by weighing **culture, background and accessibility** rather than a fixed meaning.
- ✔ Distinguish **RGB from CMYK** and explain why a brand color shifts between screen and print.
- ✔ Apply contrast and **redundancy** so that color is never the only thing carrying meaning.

# 01

PART ONE

# Foundations

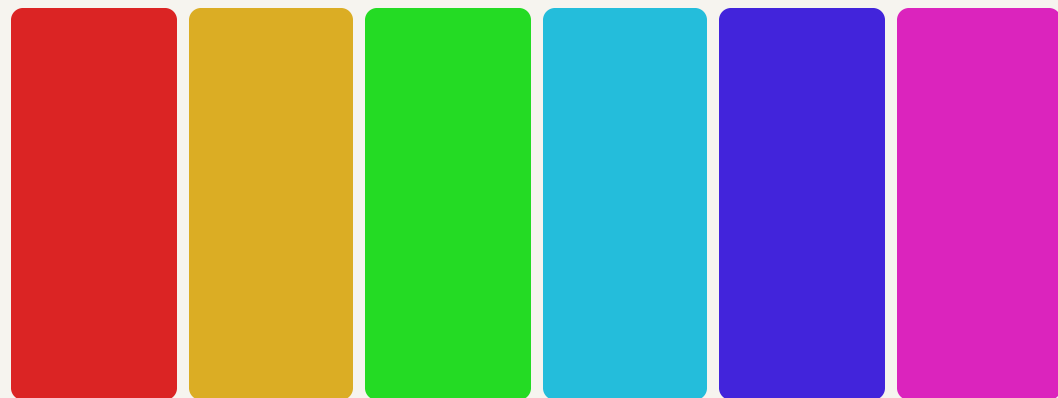
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# The Three Variables

Any color can be described with three numbers. Naming it is the least precise thing you can do.

## HUE

The named color family: red, blue, green, yellow.

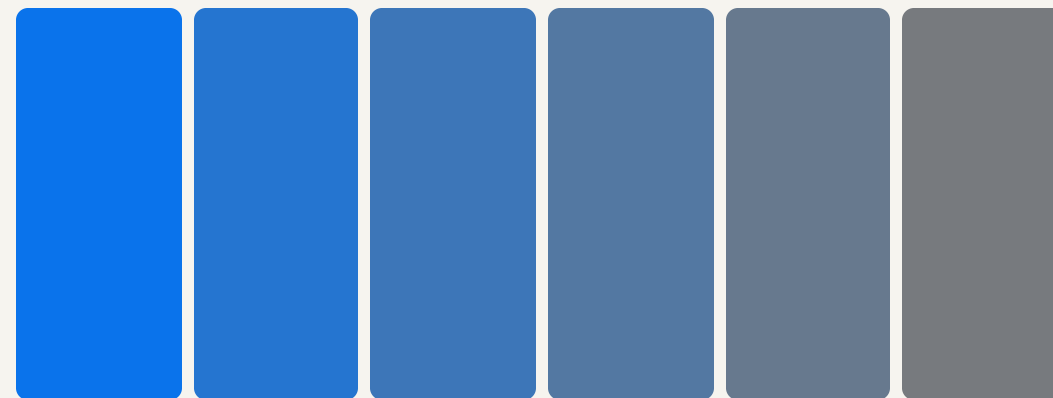


Red

Violet

## SATURATION

The intensity or purity of that hue.

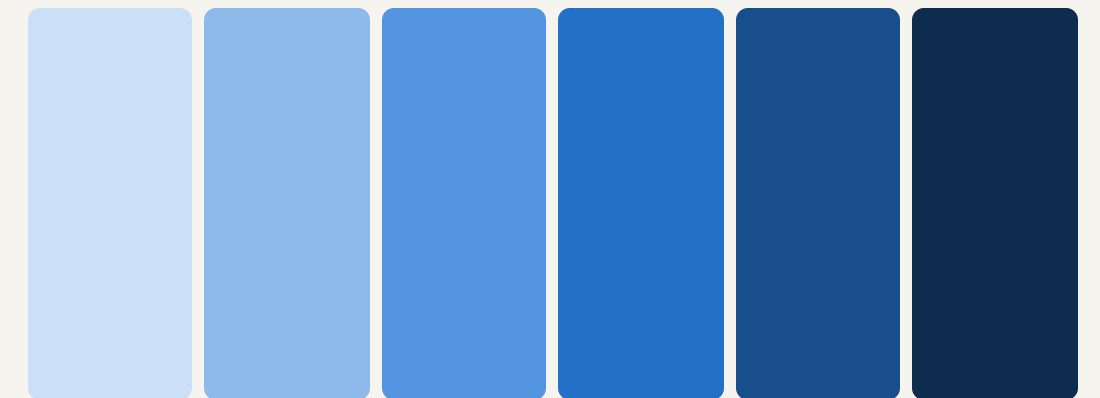


Full

Gray

## VALUE

How light or dark the color appears.



Light

Dark

## HUE · SATURATION · VALUE

The three perceptual dimensions used to describe any color. Together they explain design outcomes that color names alone cannot.

## ONE HUE, TWO ARGUMENTS



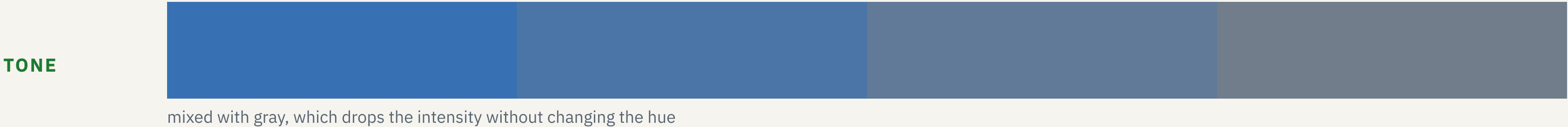
**Loud.** Saturation high, value mid.



**Serious.** Same hue, toned and darkened.

# Tint, Shade, Tone: One Hue, Many Moods

Every swatch below is the same hue. Only the white, black and gray mixed into it change.



TINT · SHADE · TONE

The three ways a single hue is adjusted. One brand color, mixed three ways, gives you a whole palette without a second hue.

SAME HUE, FOUR READINGS. ARGUE WITH THEM.

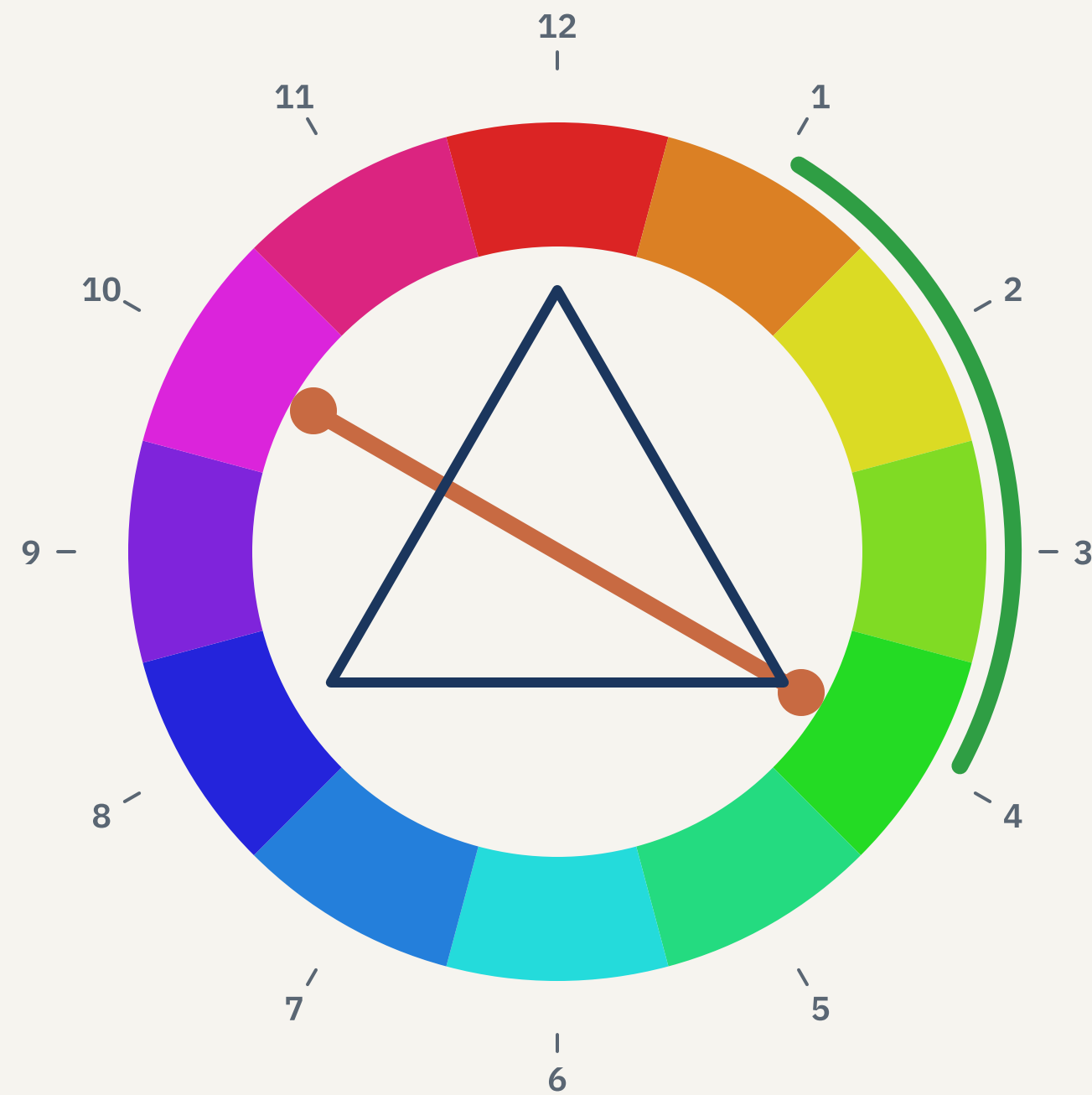
Playful

Direct

Premium

Editorial

# The Color Wheel as a Clock Face



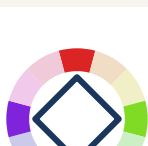
- **The wheel is a relationship map**, not a rulebook. It answers which hues are close enough to feel related and which are far enough apart to fight.
- **Picture a clock face.** Red at twelve, and every hue in order around the dial.
- **Next to each other** on the dial, and the hues feel related and calm.
- **Across from each other**, and you get the highest contrast the wheel can give you.
- **Evenly spaced around it**, and you get variety that still holds together.

This is the **RGB wheel**, the one screens and design tools use, so red sits opposite cyan. A painting-class wheel puts red opposite green. Say which wheel you are working on before you argue about a complement.

# Six Color Harmony Schemes at a Glance

## Six distances on one dial

Not six rules about which colors are allowed together.

| SCHEME                                                                                |                                                                                 | USE IT FOR                                | WATCH FOR                                                  |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------|
|    | <b>Complementary</b><br>Two hues opposite on the dial.                          | CTAs, focal points, sports identities     | Two full-saturation complements vibrate against each other |
|    | <b>Analogous</b><br>Three neighbors in a row.                                   | Editorial, lifestyle, atmospheric work    | Goes muddy without a real value difference                 |
|    | <b>Triadic</b><br>Three hues evenly spaced.                                     | Illustration, dashboards, category coding | Reads busy, or younger than you meant                      |
|   | <b>Split-complementary</b><br>One hue plus the two either side of its opposite. | Brand systems, social graphics            | Drifts without a clear hierarchy                           |
|  | <b>Monochromatic</b><br>One hue in tints, shades and tones.                     | Luxury, SaaS, minimal interfaces          | Flattens if the value range is narrow                      |
|  | <b>Tetradic</b><br>Two complementary pairs at once.                             | Large systems, data-rich interfaces       | The hardest to balance, and the easiest to overbuild       |

# Warm vs Cool: Tendency, Not Law

## WARM • REDS, ORANGES, YELLOWS



Feels active and advancing.

Comes forward in a composition.

Carries appetite cues in food and drink.

## COOL • BLUES, GREENS, VIOLETS



Feels calm and receding.

Sits back in a composition.

Carries credibility cues in finance and health.

### THEN THE RESEARCH BREAKS IT

Cool packaging often reads as healthier (Steiner & Florack, 2023), but not in every food category, and the effect can reverse. A 2024 packaging experiment found warm colors helped indulgent foods while cool colors helped the virtuous ones. Temperature interacts with category; it does not override it.

**QUICK DISCUSSION** Name one brand that breaks this pattern and still works.

# Think Like a Marketer

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A local bakery wants a logo that feels warm, inviting and appetite-triggering. Their main competitor already owns a bright, fully saturated red. Using what you know about temperature and harmony, what would you propose, and why is copying that red a weak move?



**01:30**

CLICK TO START

# Think Like a Marketer

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Shift the hue rather than the temperature. A warm orange or amber, or a red toned down and darkened, keeps the appetite cue and stops the bakery from being read as a smaller version of the competitor. Copying the red hands the category leader the association you just paid for.



**The competitor**

Owned. Fully saturated.



**Shift the hue**

Still warm, still appetite.



**Or tone it down**

Warm and a little older.

PART TWO

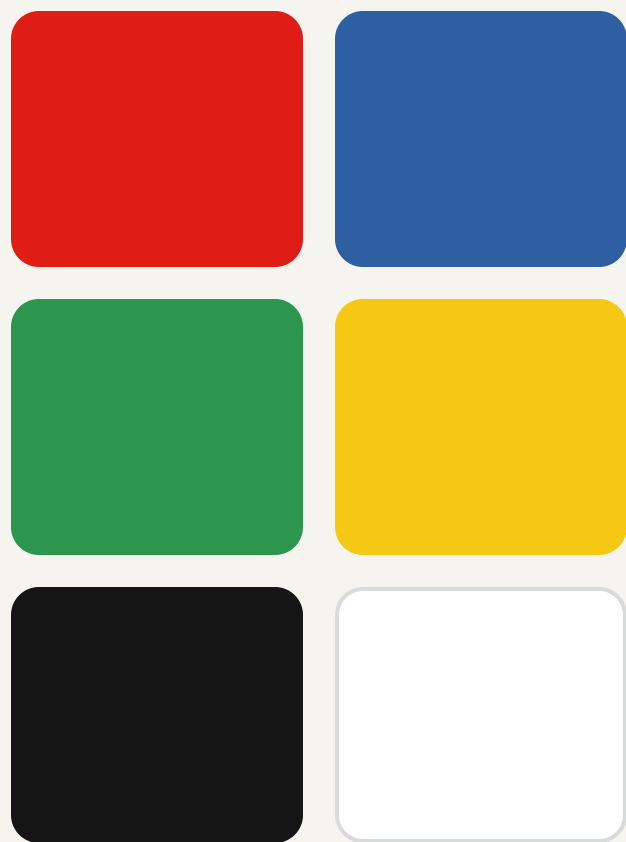
# Meaning and Culture

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# What Color Psychology Can and Cannot Prove

| THE EVIDENCE                                                                                                                                                                                                                                                                            | WHAT IT FOUND                                                                                                                                                                          | WHAT THAT MEANS FOR YOU                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><div><div><div><math>r = .88</math></div><div>agreement across nations</div></div><div><div><div></div><div></div></div><div>0, no agreement1, identical</div></div></div><div><div>4,598 people, 30 nations, 22 languages.</div><div>Jonauskaite et al. (2020).</div></div></div> | <div>Color and emotion line up strongly almost everywhere. Nation still predicted differences on top of that, and countries closer in language or geography answered more alike.</div> | <div>Expect a shared pattern, and expect it to bend at the border.</div>                                                                                      |
| <div><div><div><div>132</div><div>studies reviewed</div></div><div><div><div></div><div></div><div></div><div></div><div></div></div><div>18952023</div></div></div><div><div>A systematic review across 128 years of research, 2024.</div></div></div>                                 | <div>The links are systematic enough to study, and heavily dependent on how each study defined its colors and its emotions.</div>                                                      | <div>Before quoting a color study, ask what it actually showed people. A patch of light on a screen and a package on a shelf are not the same stimulus.</div> |
| <div><div>SO USE IT AS</div><div>a tool for generating the hypothesis worth testing. It will not guarantee persuasion, recall or conversion on its own.</div></div>                                                                                                                     |                                                                                                                                                                                        |                                                                                                                                                               |

# Common Marketing Color Associations



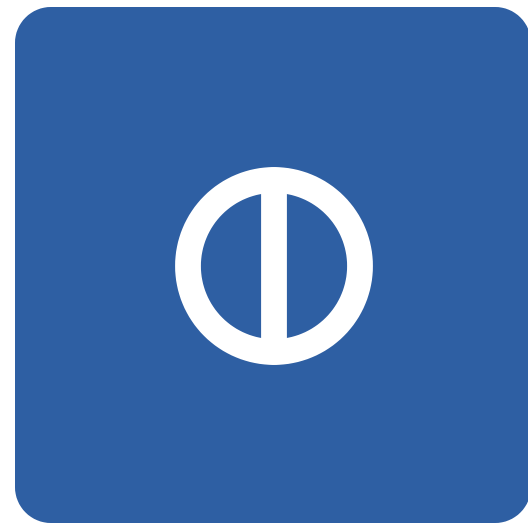
Every one has a second half

Which is why a chart of color meanings can never be finished.

| COLOR                                                                                               | OFTEN READS AS                               | AND ALSO                                                                 |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|
|  <b>Red</b>      | Urgency, appetite, excitement, arousal       | Aggression or danger too, and much more so against a dark background     |
|  <b>Blue</b>     | Trust, calm, competence, reliability         | Cold, generic or sad, depending entirely on what is placed around it     |
|  <b>Green</b>    | Nature, growth, health, money                | Shifts harder by category and by culture than any other hue on this list |
|  <b>Yellow</b> | Optimism, attention, warmth, caution         | Large fields tire the eye quickly and cost you legibility as they go     |
|  <b>Black</b>  | Sophistication, authority, luxury, restraint | Mourning, severity or rebellion, depending entirely on who is looking    |
|  <b>White</b>  | Simplicity, cleanliness, open space          | Sterile in one market, and a mourning color in several others            |

# Background Changes Meaning

The same hue. The same mark. Only the card behind it changes.



CHOSEN MORE OFTEN

**Calm. Lively.**



CHOSEN MORE OFTEN

**Sad. Dangerous.**

Celhay and Luffarelli found that a **black background strengthens the negative meanings** of a logo hue and weakens the positive ones. A **white background does the reverse**. Blue read as calm on white and sad on black. Red read as lively on white and dangerous on black.

A color meaning chart has no column for the thing the color is sitting on, which is why it can never be finished.

# Culture Rewrites the Dictionary

There is no culturally neutral dictionary of color. The same hue can carry religious, historical, political and commercial meaning at once.



Cleanliness and simplicity across much Western commercial design. A documented mourning color in parts of South Asia and East Asia, including Hindu funeral practice.



Urgency or danger in safety systems. Excitement and liveliness in brand research. Luck and happiness in Chinese celebratory contexts. Red turns up whichever meaning the audience already brings to it.



Nature and sustainability in Western branding. Longstanding religious significance in Islamic visual culture. Money and growth in finance. Powerful precisely because it is not a single code.



Sophistication and restraint in luxury. Grief in many mourning traditions. Rebellion in youth, music and fashion subcultures. Closer to a multiplier than a meaning: it strengthens the tone already in the work.

## THE RULE

Validate color in the audience's context, not in studio isolation. Problems usually surface in the secondary palette, not the logo.

# Think Like a Marketer

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Your team is putting Loop's signature green front and center on a new dark-mode screen, launching in Egypt. What would you want to check before you ship it, and why?



**01:30**

CLICK TO START

# Think Like a Marketer

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Dark backgrounds strengthen a hue's negative associations and weaken its positive ones, so the exact green that reads fresh and trustworthy on a white screen can land differently once it's dominating a dark-mode interface. Green also carries real religious significance in Islamic visual culture, which is exactly where that shift matters most in a market like Egypt. Before shipping, get native-language reviewers on the actual dark-mode screens, check what regional apps in that category do, and test whether the green reads as intended in market, not just in the design file.

Native-language review

Regional competitor scan

Test the dark-mode build, in market

PART THREE

# Color in Practice

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# Brand Color Is a Positioning Decision

Choosing a palette means balancing four things at once: the brand promise, the norms of the category, room to differentiate, and whether the color can be reproduced reliably everywhere it has to appear.

Category conventions cut both ways. An insurance brand in blue inherits the trust cues for free, and inherits the risk of looking like every other insurance brand.

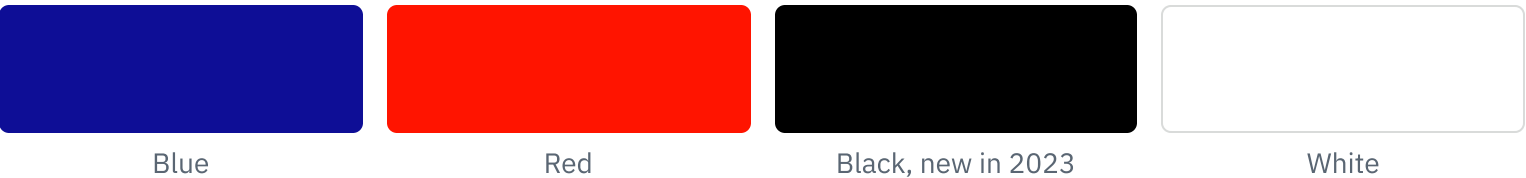
**Dunkin'** 2019 · Jones Knowles Ritchie



Dropped “Donuts” from the name and kept the orange and pink it had run since 1973. The word was the part they could afford to lose. The color was the recognition.

COLOR AS EQUITY

**Pepsi** 2023 · PepsiCo Design, in house



Kept the blue and red it had run for decades, pushed the blue more electric, and added black. The black is not a styling choice. It is the Zero Sugar can, promoted into the master brand because that is where the portfolio was going.

COLOR FOLLOWS STRATEGY

**BOTH MOVES** answered a positioning question. Neither was a fresh coat of paint.

# Color Governance: Tokens, Not Vibes

- Once it is chosen, a brand color stops being a preference and becomes a **managed asset**.
- Design systems store colors as **tokens**: named, reusable references that point at a value instead of repeating it.

**#2F9E44**

A value somebody liked once, pasted into forty files.  
Changing it means finding all forty.



**color.success**

A role. Defined once, measured for contrast, and  
reused wherever something has succeeded.

## GOV.UK DESIGN SYSTEM

Assigns functional colors by role, and tells teams not to copy its hex values directly, because the meaning lives in the role and the system around it. A success color is measured for predictability and accessibility, not picked because somebody liked that green.

## THE SAME MOVE, EVERYWHERE ELSE

Material Design and Microsoft Fluent 2 both describe tokens as what connects a design decision to the code that ships it, and the W3C design-tokens specification reached its first stable version in 2025. The reason is maintenance: change the token once and every success state in the product moves with it.

# Two Palettes, One Ships

Loop, a budgeting app. Same screen, same copy. Only the color changes.

**Bold**

BACKGROUND

CTA BUTTON

Full-saturation blue and orange. Loud on purpose.

**Calm**

BACKGROUND

CTA BUTTON

Muted, analogous blues. Safe on purpose.

- Does it vibrate, or does it work?
- Does it fit the category, or fight it?
- What does Loop want to be known for?

- 1

Look at both, on your own, no talking. Which one would you ship?
- 2

With a partner, build the case for your pick. Use something from today, not just a preference.
- 3

Be ready to defend it out loud. Someone’s going to push back.

06:00

CLICK  
TO  
START

**OUTPUT** There’s no single right pick. The reasoning is the assessment.

# Why Color Alone Fails

95.9%

of the top million home pages had detectable WCAG failures.

Low contrast text on 83.9% of them, up from 79.1% a year earlier. WebAIM Million, February 2026.

- WCAG is explicit: color must **never be the only way** information is conveyed.
- Text and interface elements need real contrast against what is behind them.
- Color vision deficiency is not an absence of color. Most people who have it see color and cannot reliably separate certain pairs, **red against green above all**.

## COLOR CARRYING THE MEANING ALONE

|                          |  |  |
|--------------------------|--|--|
| As designed              |  |  |
| Deuteranopia (simulated) |  |  |

Two states, one appearance. The distinction is gone.

## COLOR PLUS A WORD

|                          |  |  |
|--------------------------|--|--|
| As designed              |  |  |
| Deuteranopia (simulated) |  |  |

The colors still collapse. The meaning survives anyway.

## REDUNDANCY

Pairing color with an icon, a label or a pattern so that meaning does not depend on color alone.

# Think Like a Marketer

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Your team's dashboard uses five different colors to represent five product categories. No labels, no patterns, just color. A stakeholder says it's fine, the colors all look different to them. What's the problem, and what would you change?



**01:30**

CLICK TO START

# Think Like a Marketer

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Five colors with nothing else distinguishing them fails the same way red-and-green text does: a real share of users can't reliably tell that many hues apart, and even with full color vision, five similar-toned swatches get hard to track once the chart is busy. The stakeholder is testing their own eyes, not the dashboard's actual users. The fix isn't a sixth color or a better palette. It's redundancy: a label, a pattern, or a legend that doesn't depend on color alone to separate five categories.

✗ Color alone

✓ Color + label or pattern

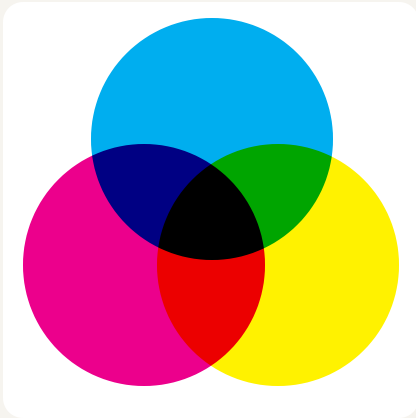
# RGB vs CMYK: Screen to Print



## RGB • ADDITIVE

Screens add light. Start at black, add red, green and blue until you reach white.

Where all three overlap, you get white.



## CMYK • SUBTRACTIVE

Ink subtracts light. Start at white paper, add cyan, magenta and yellow until you reach black.

Where all three overlap, you get near black. Real printing adds K.

### THE SAME SIX COLORS, ON SCREEN AND IN PROCESS INK

top: sRGB · bottom: through a coated CMYK profile and back



Violet



Blue



Cyan



Green



Red



Yellow

Violet and blue fall a long way. Yellow barely moves. Ink is not simply worse than a screen, it reaches a **different shape**, and that shape is what gamut means.

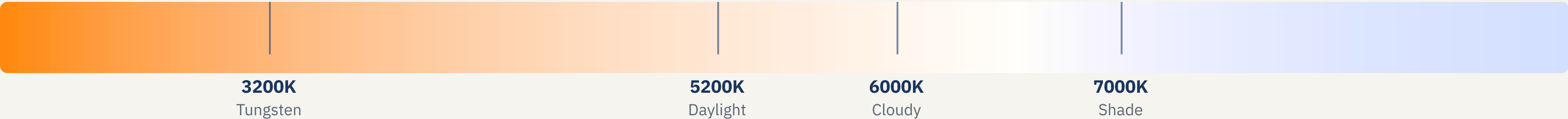
### GAMUT

The range of colors a given device or process can actually reproduce.

This is why a brand manual lists more than one value: **RGB** and **hex** for screens, **CMYK** for process print, and **Pantone** for packaging and signage, where the match has to hold.

# White Balance, and Vibrance vs Saturation

- White balance compensates for the **color temperature of the light** so that whites come out white and skin comes out believable.
- Across a batch of product shots, drifting white balance makes the products themselves look untrustworthy, long before anyone works out why.



| SAME FOUR SWATCHES, TWO WAYS OF PUSHING THE COLOR |                                                                                      |                                                                                       |                                                                                       |                                                                                                                                                                      |
|---------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Original                                          |   |   |   | <br>One vivid, one mid, one dull, one skin tone.                                 |
| Saturation +                                      |  |  |  | <br>Everything moves equally. The skin tone goes orange.                        |
| Vibrance +                                        |  |  |  | <br>The dull one moves most, the vivid one barely, the skin tone hardly at all. |

**VIBRANCE**  
A selective intensity boost that leaves already-saturated colors and skin tones roughly where they were. Saturation moves everything by the same amount, which is why oversaturating a shoot looks cheap so fast.

# Think Like a Marketer

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You approve a package design on a laptop screen. The blue is vivid and it really pops. The printed cardboard box comes back dull and slightly purple. What most likely happened, and what should have been done before that file went to print?



**01:30**

CLICK TO START

# Think Like a Marketer

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The vivid blue was almost certainly outside what four-color process printing can mix, so the press got as close as ink allows and the difference showed up as dull and slightly purple. The color should have been specified in CMYK, or as a Pantone spot color if the match had to hold, and somebody should have checked a physical proof on the actual stock before signing off.

Specify CMYK

Or a Pantone spot

Proof on the real stock

# Recap: Color as a System, Not a Superstition

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-  **Hue, saturation, value** Hue sets the family, saturation sets the intensity, value sets the hierarchy.
-  **Harmony is a distance** The schemes describe relationships on the wheel. They are not rules about which colors are allowed.
-  **Context beats the chart** Culture, category and the background behind a color all change what it says.
-  **Brand color is governed** It is a positioning decision, then a managed asset with a name and a role.
-  **Never color alone** Contrast and redundancy, every time. A word or an icon costs nothing and survives.
-  **Screen and print differ** Related systems, different gamuts. Specify for both and proof the one you cannot undo.

# Sources + Additional Reading

## COLOR THEORY AND PERCEPTION

Jonauskaite, D. et al. (2020). Universal patterns in color-emotion associations. *Psychological Science*.

Jonauskaite, D. et al. (2024). Do we feel colours? 128 years of research. *Psychonomic Bulletin & Review*.

RMIT University. Interactive colour wheel and colour relationships.

University of Wisconsin–Madison. Color theory guide.

## COLOR IN MARKETING

Celhay, F., & Luffarelli, J. (2024). Competent or sad blue? *Journal of Consumer Research*, 51(4), 820–844.

Labrecque, L. I., & Milne, G. R. (2011). Exciting red and competent blue. *Journal of the Academy of Marketing Science*.

Bortolotti, A. et al. (2024). The promise of color in marketing. *Color Culture and Science Journal*.

Steiner, K., & Florack, A. (2023). Packaging color and perceived healthfulness. *Foods*.

CXL. (2025). Which CTA button color converts the best?

## CULTURAL MEANING

Lam Museum of Anthropology. Traditional colors in East Asia; White.

USC Digital Folklore Archives. Wearing white at Indian funerals.

## IMAGE CREDITS

Dunkin' wordmark (2019) and Pepsi mark (2023). Wikimedia Commons, PD-textlogo.

The Dunkin' wordmark is shown in its published PMS 165 C and 219 C values.

The full reading list, including the photography, print and educational-resource sections, is in the session outline.

## ACCESSIBILITY AND STANDARDS

W3C. Understanding Success Criterion 1.4.1: Use of Color.

WebAIM. *The WebAIM Million* (February 2026 report).

WebAIM. Contrast checker. Section508.gov. Making color usage accessible.

National Eye Institute. Types of color vision deficiency (2023); Color blindness (2025).

GOV.UK Design System. Colour. U.S. Web Design System. Using color.

TPGi. Colour Contrast Analyser. W3C. (2025). Web accessibility evaluation tools list.

## DESIGN SYSTEMS AND TOKENS

W3C Design Tokens Community Group. (2025). Design tokens specification.

Google Material Design. Design tokens; color system overview.

Microsoft. Fluent 2 Design System. Design tokens.

## BRAND CASES AND PRODUCTION

Dunkin'. (2018). Welcome to Dunkin': new brand identity. Identity by Jones Knowles Ritchie.

PepsiCo. (2023). Pepsi unveils a new logo and visual identity. PepsiCo Design.

Adobe. Color models and color spaces; saturation and vibrance adjustments.

Pantone. Spot vs. process color. Canon. EOS R6 manual: white balance.

Nielsen Norman Group. Using color to enhance your design; visual hierarchy in UX.