

# The way I see it

## How perception of colour varies by gender, age and other physical factors.

When it comes to design, there are few elements that have as much power to influence a space's atmosphere as colour. From calming blues to energising reds, the paint and wood stain colours you choose to use across the surfaces of your project will have a significant impact on how people will experience that space and the emotional effect it will have. But behind every decision about colour lies a deeper consideration: how colour perception differs from one person to another and how human eyesight naturally changes as we age. These factors are important for creating spaces that are not only aesthetically pleasing but also functional for all users.

## The science of colour perception

Understanding how the human eye perceives colour is essential to making informed design choices. The existence of colour as we know it is essentially in our heads. We don't really 'see' colour, but rather reflected light is interpreted in our brain. Visible light is made up of different wavelengths, which are detected by photoreceptor cells in our eyes known as cones, located in our retinas. These cones convert these wavelengths of visible light into electrical signals that our brain interprets as colour. Most people have three types of cones which are each sensitive to either red, green or blue light, and they work together to allow us to perceive the full spectrum of colours. Those with colour vision deficiencies that fall under the umbrella of 'colour blindness' due to genetics, injuries or radiation treatments might have issues with their cone receptors. This can happen when one or more cones are absent, not working or detect a different colour.



There are other physical factors beyond colour blindness that affect how one person perceives colour compared to another, however, even the way a single individual sees colour is not static. Our personal perception of colour is influenced by natural and artificial lighting circumstances, adjacent colours and even the geographical location and environment where the colour appears. A hue that seems vibrant in bright natural light may look dull and muted under artificial lighting or could shift in tone. This is a key reason why it is always recommended to test samples of your Resene colour choices in situ and under different light conditions whenever possible before making final selections.

## Age-related changes

As we age, our vision naturally undergoes changes that can affect our colour perception. Many older adults develop conditions such as presbyopia, cataracts, glaucoma and age-related macular degeneration, but it's also common to experience 'yellowing' of the eye lens, which diminishes the ability to see cooler colours – particularly blues and greens. Not only can these hues take

**above:** Using high contrast colour combinations can help make it easier for those with vision deficiencies to navigate a space. The walls of this lounge area are painted in Resene Bianca, which contrasts with the walls of the adjacent dining area in Resene Coral Tree. If these two spaces were painted in the same colour, it may make it difficult to navigate between the two areas and the corners at the transition could become an unintended hazard. Floor stain washed in Resene Colorwood Breathe Easy. Tables and chairs from Soren Liv, artwork by Neil Driver from Parnell Gallery, vase, jug and tableware from Slow Store, rug from Baya.

**left:** The beauty of universal design – where a project has been designed in a way that addresses the needs of users of all ages, genders and abilities while also championing aesthetics – is that everyone wins, and it proves that inclusive design strategies can also be beautiful. Carefully considered colour, material, furniture and décor selections can ensure spaces look and feel good to use. Since there are not many surfaces that cannot be painted, Resene products can be an effective solution in all sorts of universal design applications. Back wall, shelf, built-in sideboard and mouldings painted in Resene Resolution Blue, passthrough wall in Resene Bianca, right wall (in adjacent space) in Resene Coral Tree and floor stain washed in Resene Colorwood Breathe Easy. Sofa, coffee table, fruit tray and ceramic basket from Slow Store, side table and bookends from Soren Liv, artwork by Greer Clayton from Parnell Gallery, lamp from Kayu Studio, cushion from Cittá, rug from Baya.

	Resene Bianca
	Resene Colorwood Breathe Easy
	Resene Coral Tree
	Resene Resolution Blue

## top tip

You can use Resene colour codes to help identify colour differences. For example, the Resene colour code for Resene Breakwater is B54-054-263. The '54' is the luminance (which is similar to LRV), the middle part '054' is the saturation and '263' is its position on the colour wheel. Each of those elements can be used to compare colours to add additional contrast.

Resene  
Breakwater

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on a yellower appearance, but it can also become more difficult to differentiate between them as many older individuals have reduced contrast sensitivity, meaning they struggle to distinguish subtle differences between shades.

If you or your client are experiencing age-related changes, you may find your colour selections are perceived differently and, ultimately, experienced differently. A room painted in pastel blues, for example, may appear washed out and lack vibrancy for someone with age-related vision changes. Similarly, subtle colour distinctions – like those between light shades of purple and blue or similarly saturated yellows and greens – may be lost entirely.

Warm colours such as reds, pinks and oranges tend to retain their vibrancy and thus can be easier to distinguish as we age. These colours also evoke feelings of warmth and energy, which is beneficial for creating cosy or dramatic spaces. Spaces that focus on comfort, like bedrooms, benefit from warm, rich tones that maintain their appeal despite age-related vision changes.

For older individuals, high-contrast colour schemes can be crucial for ensuring that a space remains visually accessible. Rooms with contrasting colours are easier to navigate and key design elements such as doors, furniture and stairways stand out better when framed by contrasting walls or trims. A soft cream coloured wall in Resene Creme De La Creme paired with a midnight blue trim in Resene Carpe Noctem ensures that edges are clear and easy to define – and keeps them from becoming obstacles or safety hazards. This specific example is particularly high in contrast and might be excessive for your project requirements or aesthetics. The best way to ensure adequate light-dark contrast – neither too much nor too little – is by looking to the light reflectance value of your shortlisted Resene colour selections.

Light Reflectance Values (LRVs) work on a 0-100% scale and measure what a colour looks like. If you are working on an aged care facility that has a contrast guideline of 30% LRV, you would

need to subtract the lower LRV value from the higher one and get a result of at least 30 to give the required colour contrast difference of 30% LRV. You can find the estimated LRV of your Resene colours on the back of your colour swatch or in the online Resene Colour Library, [www.resene.com/colour](http://www.resene.com/colour).

Be sure to keep in mind that these colour and contrast considerations are not only important in places where older adults will be living but also in public spaces like medical clinics, retail spaces, libraries, airports, transit stations, theatres, cafes, restaurants, fitness facilities and community centres. Often, when you take an elder-friendly approach to design, it ends up offering inclusive benefits to people of all ages and abilities and can improve the wayfinding and navigability of your project.

## The gender factor

Research into the differences in colour perception between those who have been assigned male versus female sex at birth has revealed intriguing patterns. On average, women tend to have a more acute ability to distinguish subtle variations in colour than men. This heightened sensitivity means that women can usually more easily differentiate between slight shades of similar colours—such as the difference between two different pastels or the subtle shift between blues and purples. Men, on the other hand, are generally more sensitive to broader contrasts and saturated colours and thus may be drawn to primary or vivid hues.

These differences are generally believed to be rooted in biology and social conditioning. Women tend to have more robust colour receptors due to genetic and hormonal factors while ideas around traditional gender roles related to hunting and gathering has led to evolutionary theories about identifying ripe fruits and survival tactics. Socially, some may be exposed to a broader range of colours through interests in fashion, art and design while others may have more limited colour experiences due to the nature of their upbringing. Regardless of where someone fits on the gender spectrum, it is likely worth asking your clients questions about their interests during your design development or needs assessment phase rather than making assumptions.

## Practical considerations

When you're tasked with more than just choosing appealing colours; it's vital to also consider how those colours will function in the long term. This is particularly important when working with both interior and exterior paints, stains, wallpaper and other decorative and protective coatings.



**above:** As our eyes age, it's common for colours to appear more yellow than they did when we were younger – especially greens. Choosing to incorporate warmer greens and neutrals that have inherently yellow undertones can work with this age-related change rather than against it and selecting materials, furniture and accessories that go with your yellow-influenced hero hues will ensure these items don't appear to clash from your client's perspective. Transition areas such as hallways or walkways are a great place to add colour to differentiate each zone. Front wall and architraves in Resene Bud and floor, back wall (through doorway), lamp base and floor vase painted in Resene Bubble White. Artwork from H&M Home. Projects by Amber Armitage, images by Wendy Fenwick.

	Resene Creme De La Creme		Resene Bud
	Resene Bubble White		Resene Carpe Noctem

Age-related changes in vision also make it important to choose colours that are easy to identify and distinguish for people of all ages. On building exteriors, high-contrast designs that provide clear definition between key elements – such as entry points, windows and trims – will help ensure accessibility for older individuals and others with visual deficiencies. When selecting interior colours, designers must consider both visual appeal and practicality. Some rooms, like bedrooms, benefit from soothing tones like warm light blues, soft purples or warm neutrals like Resene Cut Glass, Resene Petal or Resene Double Spanish White. However, in spaces like commercial offices, libraries or retail settings, more energetic colours like warm terracotta tones, oranges or reds like Resene Coral Tree, Resene Clockwork Orange or Resene Persian Red can promote productivity and foster a welcoming atmosphere.

For spaces designed for older individuals or those with impaired vision, consider using strong contrasts between walls and furnishings. If possible, avoid subtle shifts in colour that may be difficult to perceive—light yellows and pale pinks may blend into one another, especially in low-light environments. Instead, consider pairing warm neutrals with accent walls in vibrant colours to create depth and contrast.

Thanks to technological developments, you now have a wealth of tools to help find the right colours that will best serve your client’s preferences, the needs of your project’s users and the overall design aesthetics. Resene’s free digital colour visualisation tools like Resene ColourMatch online ([www.resene.com/colourmatch](http://www.resene.com/colourmatch)), the Resene Colour Palette Generator ([www.resene.com/palettegenerator](http://www.resene.com/palettegenerator)) and Resene EzyPaint virtual painting ([www.resene.com/ezypaint](http://www.resene.com/ezypaint)) allow for the discovery and testing of different colour combinations without having to lift a paintbrush, ensuring that the result is in alignment with your design vision. The free online Resene Colour Library also has plenty of helpful information about luminance, saturation and light reflectance value (LRV) that can provide insight into whether your Resene colour selections will offer adequate contrast for your project needs.

## Knowledge is power

Colour is one of the most influential elements of design, affecting mood, functionality and accessibility and understanding how colour perception changes with age and differs between genders is crucial for creating spaces that cater to a diverse audience. By incorporating strategies that account for age-related vision changes and gender-specific preferences, you can ensure that your projects remain vibrant, functional and accessible for years to come.



**left:** It can become harder to differentiate between similar colours as we age. While the subtle tones of the palette on the left may be easy to tell apart for someone who doesn’t suffer from colour vision deficiencies, many of these hues could appear identical to others and you may need to incorporate slighter higher contrast accent colours or warm reds, oranges or pinks to make your design more effective. Resene testpots in (top image, clockwise from top left) Resene Chicago, Resene Shark, Resene Bubble White, Resene Miso, Resene Iko Iko, Resene Siam and (centre) Resene Bud, (bottom image, clockwise from top left) Resene Chicago, Resene Shark, Resene Bud, Resene Miso, Resene Iko Iko, Resene Siam and (centre) Resene Half Hairy Heath.

	Resene Bubble White		Resene Cut Glass
	Resene Miso		Resene Petal
	Resene Double Spanish White		Resene Coral Tree
	Resene Iko Iko		Resene Clockwork Orange
	Resene Bud		Resene Half Hairy Heath
	Resene Siam		Resene Persian Red
	Resene Chicago		Resene Shark

## top tip

The approximate light reflectance value (LRV) of an individual colour indicates the proportion of light that a surface reflects compared to the amount of light that falls on that surface. Dark, matte and/or textured surfaces absorb or diffuse a lot of light and will ultimately have lower light reflectance values than the estimation noted on your Resene swatch or colour chart. Conversely, light, glossy and/or smooth surfaces reflect more of the light that falls on them and have higher light reflectance values. LRVs are difficult to determine from semi-transparent finishes such as wood stains. Light travelling through these finishes gets absorbed and/or is reflected by the underlying timber. A stain applied over pine will also have a substantially higher light reflectance value than the same stain applied over a darker timber like kwila. This is why there is not a standard light reflectance value provided for wood stain colours.

The more we balance aesthetics with inclusivity, where every person, regardless of their age, ability or gender, can feel comfortable and engaged within the spaces they inhabit, the better off we’ll all be. By researching new developments, testing new-to-you combinations in real-world settings and utilising free Resene colour, spec and tech tools to refine your design choices, you can help to improve the user experience of your project across the full spectrum of ages, genders and abilities. **BW**

**Along with Resene’s online tools, be sure to check out the Resene webinar archive ([www.resene.com/webinars](http://www.resene.com/webinars)) and previous issues of *BlackWhite* magazine ([www.resene.com/blackwhitemag](http://www.resene.com/blackwhitemag)) to learn more about colour and paint science.**