



Creativity + Innovation & Technology

O-CITY PROJECT



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## **Topic 1 - Lesson 3. Basic visual elements in UX**

This lesson has been prepared to improve the knowledge of the visual basics for designing the graphical elements of a user interface or an information visualization, in order to facilitate the design choices in the creation of an infographic or a website.

Graphical elements are used in visual design to fulfill several objectives such as usability, comprehensibility, originality, arousal of emotion, etc. Frequently, designers have to choose what goals to focus on, while giving low priority to others (for example, in the creation of an artist's website, originality is a fundamental feature to highlight, while it is less important for a technician's website). However, it is always good to balance aesthetics and functionality. Indeed, a good visual design is consistent with the content on the page or function and enhances the User Experience by relying on common principles and basic elements.

Usually, when looking at an image, we can immediately say if it appears pleasant or not. In Lesson 2 we saw how Gestalt principles can support the realization of more pleasant and usable user experiences with user interfaces or infographics.

In this lesson, we will analyze three concepts that are fundamental basics for visual design: layout, colours and typography, trying to find a direct link with topics learned so far about Gestalt principles.

### **Layout**

The layout is the arrangement of the visual elements in a virtual or physical environment, for example a screen or a page.

The organization of the space is key to every great design. It deserves attention because it consists of a lot of elements that have to be considered as a whole.

Visual-design principles suggest that design elements such as line, shape, colour, grid, or space go together to create beautiful images.

In this sense, focusing on the layout means to define perception rules and to organize contents in order to create one single composition.

As we saw in Lesson 2, the modern concept of visual perception is directly linked to science, but also to psychology. As a result, it is very important to take into account the way we see and perceive information in order to graphically compose a good layout.

The structure and arrangement of the elements within the screen is very important to create a visual flow. For example it is useful to align objects, if you want to relate them to each other. Focusing on this, means defining rules that give your designs a consistent rhythm so that creating a polished and predictable experience for users that contributes to increase trust and affection towards the brand.

A good visual flow is created by arranging elements according to the principles of visual hierarchy.

What does visual hierarchy mean and why this concept is related to layout?

Defining a visual hierarchy means focusing on the positioning of the different design components with the intention of giving them the proper importance.

The visual hierarchy is determined by certain features that make up the layout: size, colour and shape of the typeface, distance, proportion and orientation of the text, as well as of the other visual elements composing the UI or the information visualization.

Within a graphic or textual composition each element has a role that is understood based on comparison with others. Thus, since there is a relationship between all the elements, a visual hierarchy is established to understand who has more relevance than another.

For example, to indicate to users what content is most important, we suggest using a larger font size (2-3 different sizes are allowed throughout the text) or placing it at the highest level of the page, as the following examples show.

In Figure 1 each element of the article is of a size equal to its importance. In this way, the author of the flyer wants to capture our attention on the event (City Nature Challenge 2019), and the place of the performance (Ville de Luxembourg), which in fact are made with a font size larger than the rest. In Figure 2, we not only notice that the author of the infographic of Colosseum wants to underline certain elements by using a larger font, but also that many Gestalt principles, for example Common Region, Proximity, and Symmetry, heavily influence visual hierarchy by creating two main blocks of information.



Fig. 1 - Example of hierarchy applied on a flyer. Source:

[https://commons.wikimedia.org/wiki/File:City\\_Nature\\_Challenge\\_2019\\_Luxembourg\\_flyer\\_front.jpg](https://commons.wikimedia.org/wiki/File:City_Nature_Challenge_2019_Luxembourg_flyer_front.jpg)

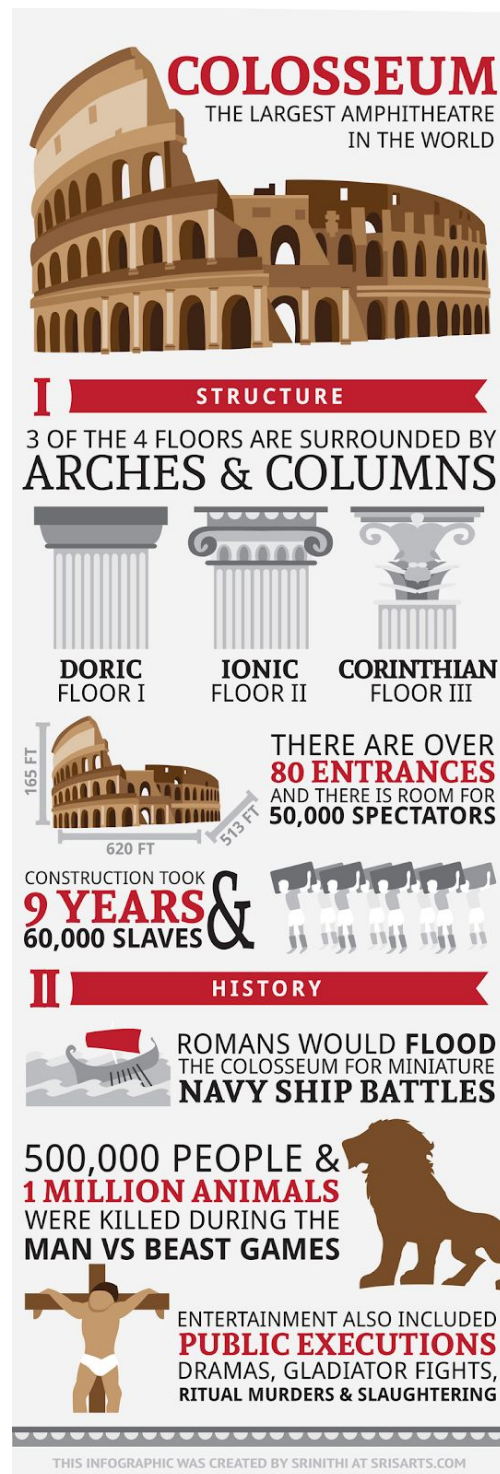


Fig. 2 - Colosseum infographic by Srinithi. Source: <http://www.sris-arts.com/colosseum>

These and other conventions should be followed in the spatial arrangement, to avoid creating misunderstandings and dissatisfaction in the User Experience or to allow readers to quickly define the type of content. In this regard, some layouts have now become standards, such as the structure of the e-mail.

Of course, one of the most important effects to avoid in creating a visual design is clutter. In this sense, on each page or screen there should be the right amount of elements with the right

disposition, in order to avoid confusion. To facilitate the alignment and organization of visual elements it is preferable using a grid system to logically and tidily organize them. You can see two examples in Figure 3.



Fig. 3 - Example of symmetrical and asymmetrical grids applied on a magazine by Olana Velarde on Visme blog.

Source: <https://visme.co/blog/layout-design/>

## Colours

Colour is a critical part in the logical organization of a page or screen, because it attracts attention, sets a mood, and can be used to influence perceptions. As the Gestalt laws suggest, the use of colour is helpful for correlating or differentiating elements: thus objects that have the same colour can be interpreted as semantically or functionally close (Principle of Similarity), and vice versa. That's why if applied incorrectly, it can create annoyance and confusion for the user. It can be even responsible for considering a project unpleasant and ineffective. In this sense, the use of colour really affects the usability of a User Interface or information visualization.

Before explaining how to apply colour in visual design, let's find out more about how colour works!

In general, the main components of a colour are Hue, Saturation, and Luminance or Brightness as Figure 4 shows.

- Hue is the pure colour.
- Saturation refers to the intensity or dullness of the hue. A hue can be desaturated with white (lightening the colour), grey (fading the colour) or black (darkening the colour). A full saturation of the colour is equivalent to its pure hue.
- Luminance or Brightness is the factor that indicates the amount of light in the hue. The more light there is in it, the brighter it is.

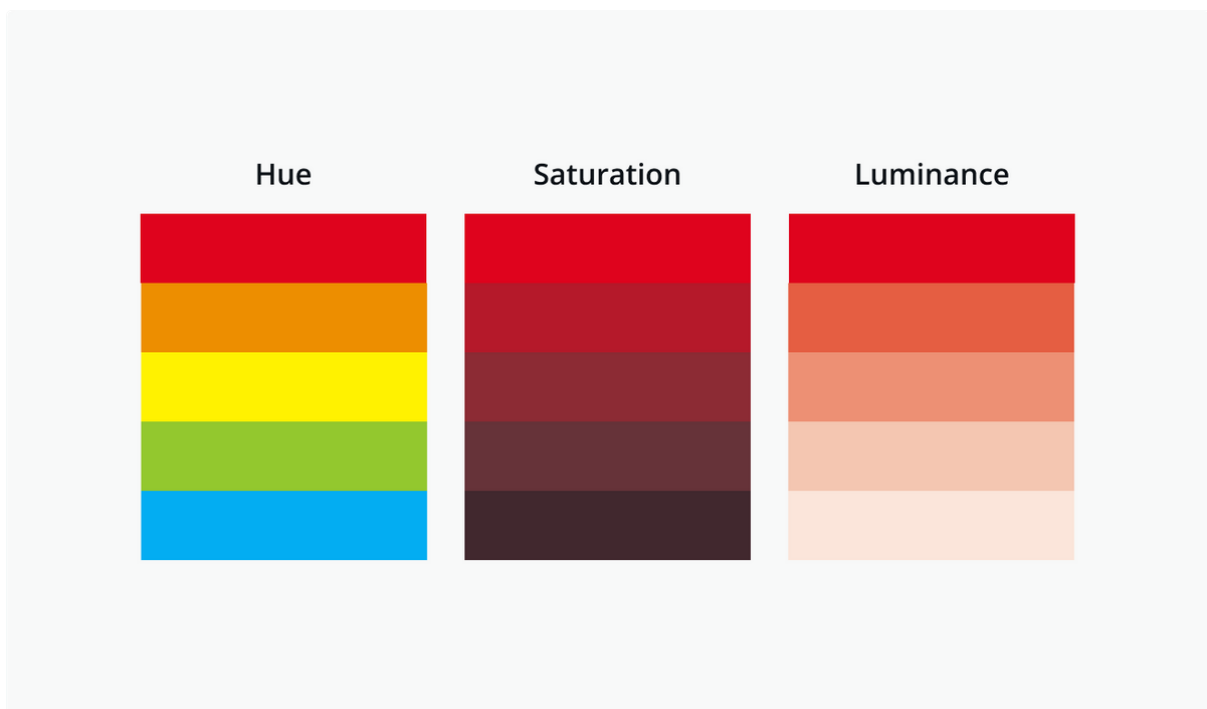


Fig. 4 - The main components of colour. Source: <https://www.canva.com/colours/colour-wheel/>

These concepts are fundamental in the combinations of colours theorized by the colour theory, since basically colours with equal luminance and saturation are combined, as this creates a coherent and uniform appearance.

The colour theory is based on the colour wheel, invented in the 17th century by Isaac Newton. In detail, through a map that places colours on a circle, it is possible to identify all the relationships between colours and establish those that are in harmony with each other. Let's look at Figures 5, 6, 7 and 8 to see how to combine different kind of colours, taking into account that:

- Combining complementary colours means using two colours placed opposite each other on the colour wheel (Figure 5).
- A triadic colour scheme is one that uses three colours equidistant enough to form a triangle (Figure 6).
- You can also combine up to five colours that are adjacent to each other (analogous colours) on the colour circle (Figure 7).
- A tetradic colour scheme combines one primary and two complementary colours (Figure 8).

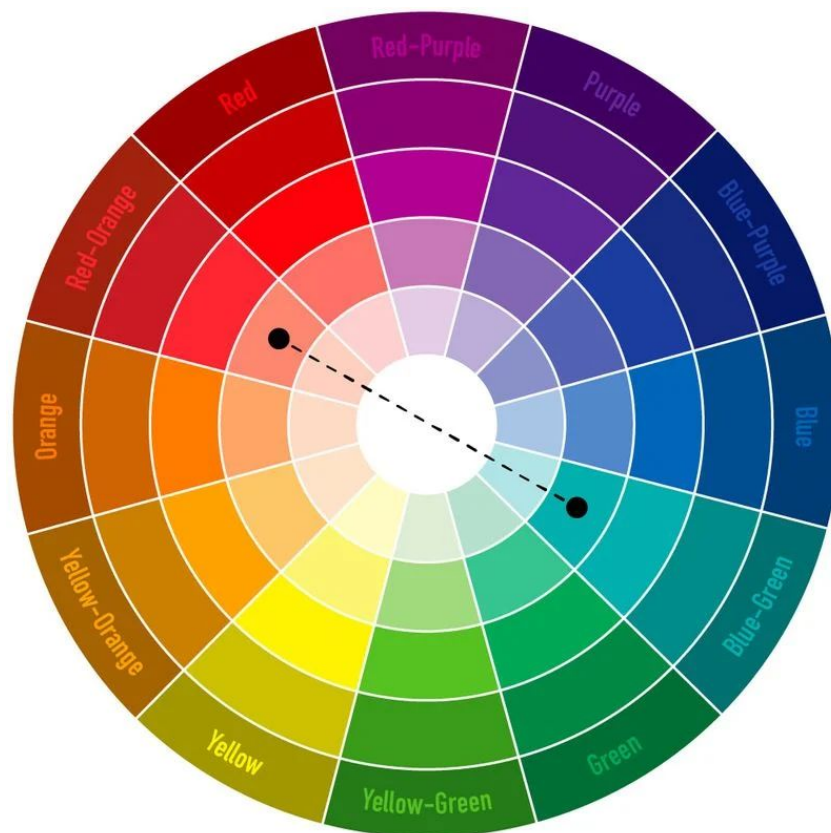


Fig. 5 - Combination of two complementary colours within the colour wheel.  
Source: <https://www.canva.com/learn/100-color-combinations/>

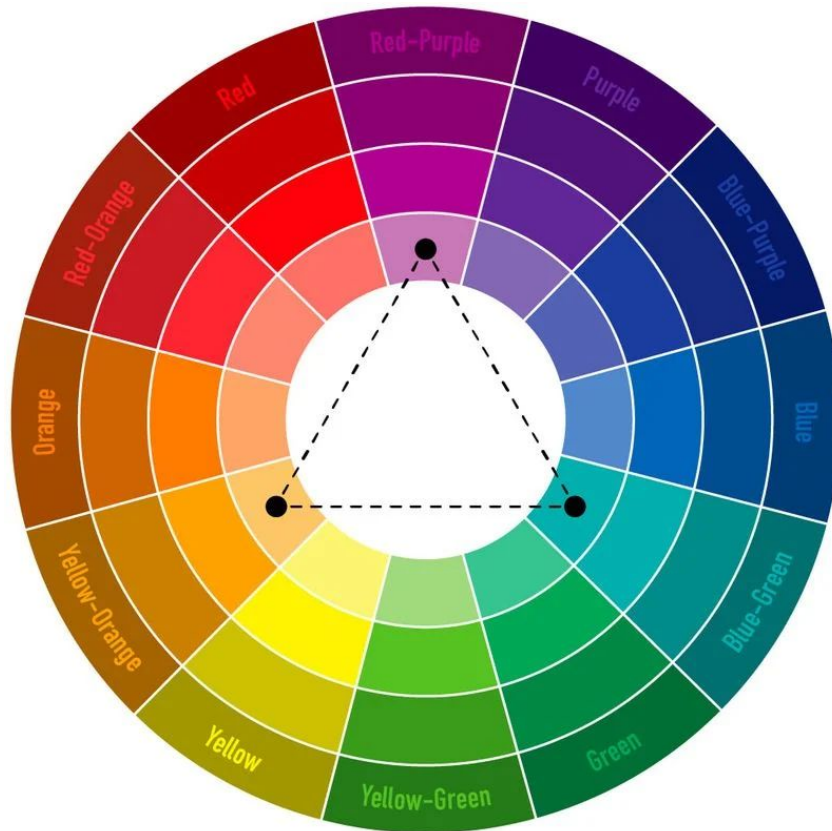


Fig. 6 - Triadic colour scheme within the colour wheel. Source: <https://www.canva.com/learn/100-color-combinations/>

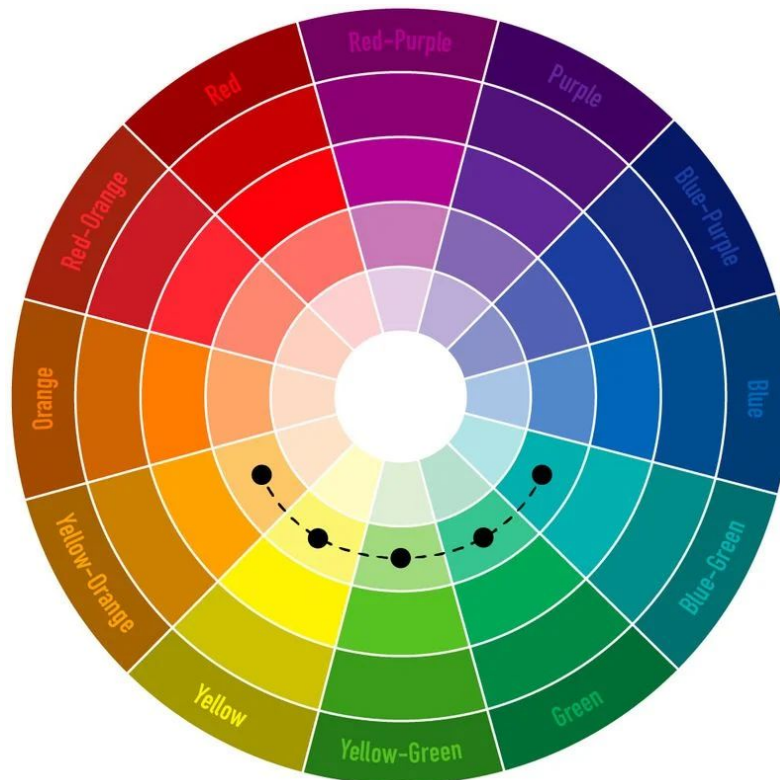


Fig. 7 - Analogous colour scheme (combination of 2 to 5 adjacent colours) within the colour wheel. Source: <https://www.canva.com/learn/100-color-combinations/>



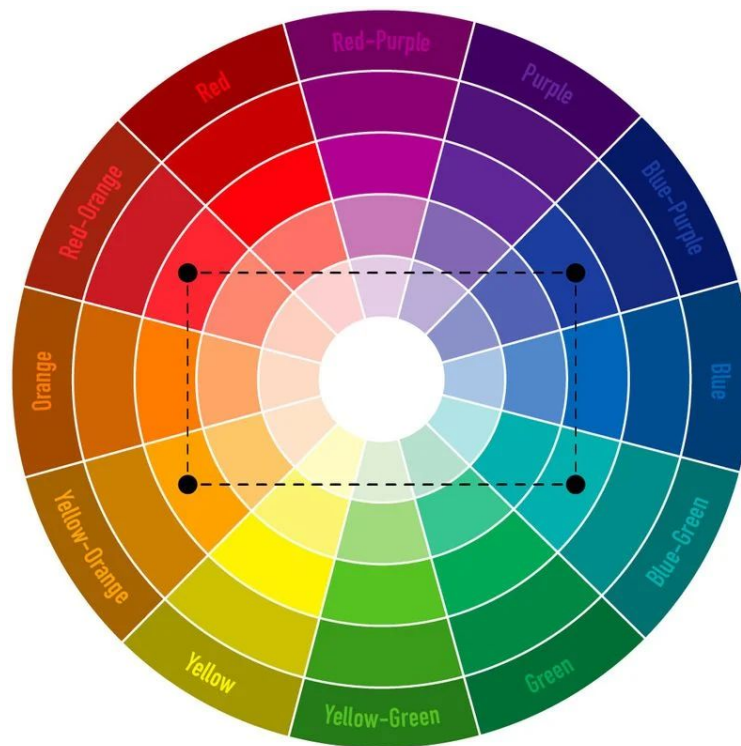


Fig. 8 - Tetradic colour scheme within the colour wheel.

Source: <https://www.canva.com/learn/100-color-combinations/>

Another important concept about colour is the difference between colours used in the digital world and those suitable for printing, that refers to two main models: RGB and CMYK.

The RGB model (whose primary colours are Red, Green, Blue) is used in the digital world. It is also called the "additive model" because the sum of the three colours creates white. The colours in the RGB model are the result of transmitted light.

The CMYK model (whose primary colours are Cyan, Magenta, Yellow, Black) is suitable for printing. It is called the "subtractive model" because the sum of its primary colours creates black. In this case, the colours in the CMYK model are the result of the light absorbed or reflected by a surface.

Having defined these few basics, let's focus on how to apply them in a visual design project.

The following pictures (Figure 9 and 10) show you the combinations of colours that compose two specific images by representing them in a palette, i.e. the range of colours used in the image. In the analogical world, the colour palette corresponds to the set of colours that the painter finds on his/her painting palette.

Of course, knowing the general rules that affect the combination of colours is helpful for generating beautiful colour palettes. In realizing the graphical elements of a website or an infographic, it is recommended to start by creating the colour palette, in order to define the general mood to convey and make a consistent use of colours.

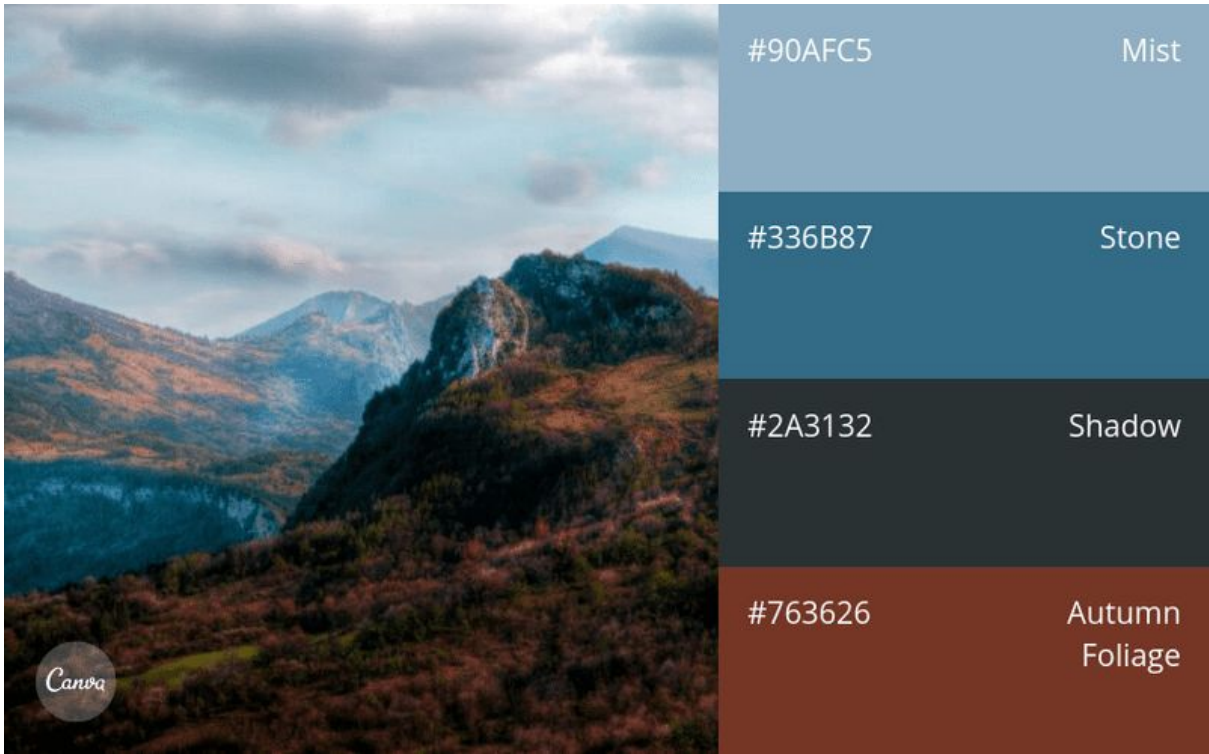


Fig. 9 - Example of a palette obtained from a photo. Source: <https://www.canva.com/learn/100-color-combinations/>



Fig. 10 - Example of a colour palette based on the combination of analogous colours within the colour wheel.  
Source <https://visme.co/blog/colour-psychology-in-marketing-the-ultimate-guide/>

You can find a lot of free online tools and resources that can help you in the choice of colours, since they suggest different combinations according to the colour wheel or automatically generate colour palettes. Following a few examples.

You can use the tool in Figure 11 to play with the colour wheel with the aim of generating a colour theme and then saving it to create the colour palette for your project.

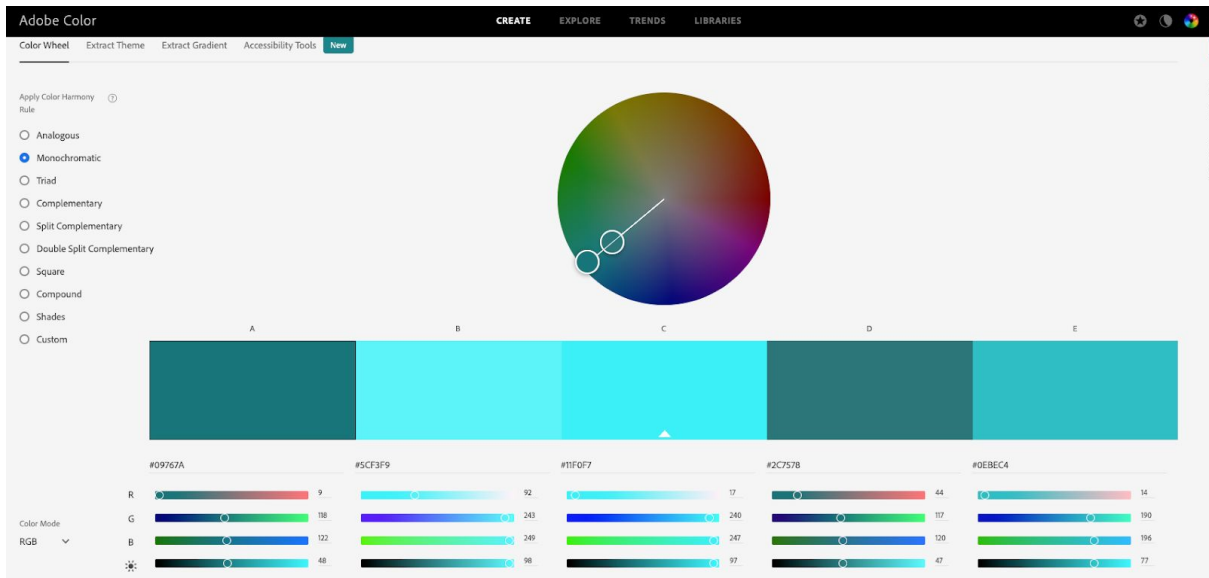


Fig. 11 - Example of a professional online free tool for generating colour themes.

Source: <https://colour.adobe.com/it/create/color-wheel>

The website shown in Figure 12 allows you to figure out how to apply a specific colour palette on a User Interface, as it creates a preview according to the selected colour theme (push the button “generate” and see how the visual aspect of the user profile changes).

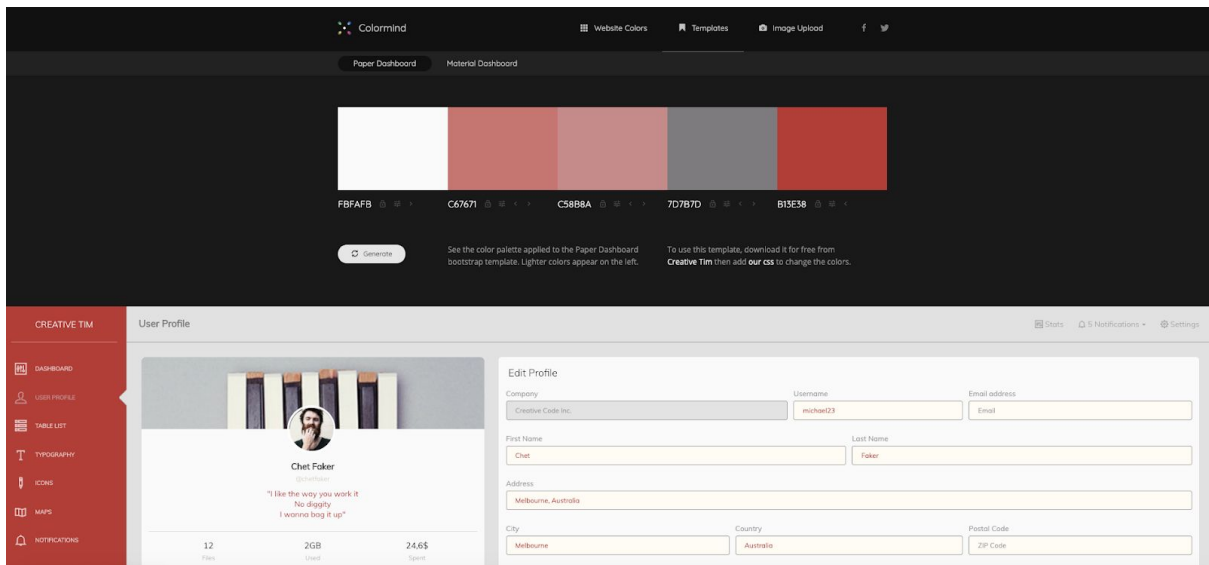


Fig. 12 - Example of an online free tool for trying out your colour palette.

Source: <http://colormind.io/template/paper-dashboard/>

The ability to combine colours does not matter only for aesthetic reasons, but also because of usability!

In choosing the colours of your UI or information visualization, be sure to avoid generating any problem related to sight. Indeed, the main usability problems related to the use of colour usually affect the legibility (i.e. the text) of UIs and information visualizations. Even if here we will not deal with colour vision deficiencies or special needs, remember to always consider who users are and what the context of use is.

As a general rule, it is preferable to use a light background with text in contrasting colours with the background. It is also possible to use white text with dark writing. The important thing is to achieve a sufficient contrast between the background colour and the foreground one, in order to better distinguish subject and background.

Pay attention that the use of backgrounds with textures that hinder the reading of the text should be rejected. Even the so-called chromostereopsis, which occurs when two colours placed side by side seem to vibrate (such as blue text on a red background), must be avoided, since it often results in irritating the sight, as you can experience in Figure 13 and 14. This effect can be avoided by using different colour saturations and contrasts or by separating the two vibrating colours with an achromatic border. In general, coloured text on a coloured background could be problematic, especially if the principles of the colour theory are not properly taken into account.



Fig. 13 - Example of vibrating colours that make it difficult to focus on both colours and then reading the text by Eli Schiff on Envato. Source:

<https://webdesign.tutsplus.com/articles/why-you-should-avoid-vibrating-color-combinations--cms-25621>



Fig. 14 - A problematic use of colours in a museum website. Source: <https://www.museomacro.it/>

You also have to consider that colour can recall cultural conventions (see Figure 15). For example, in Western society red is a symbol of danger or trouble, while green is a symbol of all clear. In this sense, colour is very often used as a sign to convey some shared meaning and can help in communicating a message to the viewer. That's why it can be successfully used to quickly express the meaning of some functions in a User Interface: red can be used to communicate an error and green to confirm an action. However, you should also consider the opposite: if the content is conveyed exclusively with colour not all users would be able to understand it.

Moreover, the use of colour is often based on psychological factors, other than on cultural and experiential ones (see Figure 16).

To sum up, we can say that to create a well-defined and consistent model for the use of colours in visual design, it is important both to know their meanings and how to properly combine them.



Fig. 15 - Example of how culture can influence the use of colours.  
 Source: <https://coloursandmaterials.files.wordpress.com/2014/11/culture.jpg>



Fig. 16 - Example of how psychology and perception can influence the use of colours.

Source: <https://www.pinterest.de/pin/418905202812234097/>

## Typography

Typography deals with the arrangement of type in a way that makes text legible, clear and appealing for the reader.

Typographical choices in the visual design play a very important role, as they favor the effectiveness and efficiency of the text. Indeed, the immediate understanding of a text is essential in UIs and information visualizations, especially when users have to quickly get the needed information.

Following a few considerations about the main aspects of typography for introducing you to this fundamental element of visual design.

Let's start from the fact that, when designing a written content, first of all, you need to select a typeface.

Typeface or font family is a set of fonts that share the same design rules. Font families can be classified into two main classes:

- Serif, i.e. all those fonts that have a small decorative stroke (called serif) attached to the end of the character. They are often rich in detail and are not always suitable for quick viewing of



digital content. On the contrary, they make more readable printed content and large texts, such as books. Serif typefaces are considered classic and formal.

- Sans-serif, i.e. fonts that do not have the small decorative stroke (from the French "sans" meaning "without") attached to the end of the character. Sans-serif typefaces are more suitable for small texts, web content and the text used for UI elements, such as icons and UI controls (e.g. a button), since they are perceived as more instantaneous. In contrast to serif typefaces, sans-serif ones are considered simple and modern.



Fig. 17 - Example of serif and a sans-serif font. The stroke in red is called serif. Source: <https://it.wikipedia.org/wiki/File:Confronto-caratteri-con-grazie-senza-grazie-serif-sans-serif.jpg>

A typeface comprises a set of related fonts with different weights, widths, and styles, e.g. light and bold, regular and oblique (or italic), etc., as you can see in the following example (Figure 18).

Arial Regular  
*Arial Italic*  
**Arial Bold**  
Arial Narrow  
**Arial Black**  
Arial Nova  
Arial Nova Light  
Arial Nova Condensed  
Arial Nova Condensed Light  
**Arial Rounded MT Bold**

Fig. 18 - Example of different fonts based on weight, width and style. Arial is the typeface comprising all the related fonts.

In general, bold fonts have more visual weight and are more appropriate for headlines or content with little text. In contrast, light or thin fonts are appropriate for body text, as they flow more smoothly when viewed in quick succession. Moreover, thin fonts are often chosen because they convey elegance.

Surely, there are several recommendations that must be followed in typographical choices. Here some quick suggestions:

- **Size:** Better to use a standard size for text and increase the size for labels and titles. Don't use uppercase only, which slows down readability.
- **Alignment:** A left-hand alignment with an irregular margin, i.e. not justified, is more readable. Usually only text with a long line length is justified.
- **Leading:** The vertical space between each line of type should be 20% larger than the font size. So, for a 10-point font the leading should be 12 points. Characters of less than 8 points are an exception, as they need more line spacing to ensure their legibility.
- **Italics and underline:** In general, this combination should be avoided, as it can produce jagged fonts on low resolution monitors. With serif this effect is even more annoying. Taken separately, just like italics, it is good to use underline only when necessary (commonly it is used to underline links for websites).

In addition, let's see in Figure 19, some possible ways to adequately associate different fonts based on the contrast their combination creates.

# 7 WINNING WAYS TO ADD CONTRAST IN FONT PAIRING USING TYPEFACE ANATOMY

1- Vary typeface character stroke weight

**BOLD**

**THIN**

2- Pair non-italic with oblique styles

**REGULAR**

***OBLIQUE***

3- Match monospace font with condensed font

**monospace**

**CONDENSED**

4- Use fonts with different axis of curved strokes

**STRAIGHT**

**CURVED**

5- Contrast font metrics like the baseline

*Metrics*

**baseline**

6- Use joining character strokes with disjointed glyphs

*Joint*

**Disjoint**

7- Differ the x-height of fonts from small to CAPS

**Small**

**CAPS**



Fig. 19 - Infographic with some examples about how to associate different fonts.

Source: <https://www.pinterest.it/pin/713468765949554984/>

In design, contrast is an important and powerful rule; it adds focal points and keeps things from looking boring. Elements such as different colours, typefaces, as well as even sizes and shapes, can be used to achieve this goal.

However, you need to be careful not to overdo it. Otherwise you will generate disorder and confusion. Using, for example, a lot of different fonts and inserting them in the text at random, i.e. without the purpose of finding a coherence with the kind of content, is a frequent mistake among people who are not expert in graphics. This improper use of fonts affects in a bad way the overall design, not only because it produces a distracting layout, but also because it determines an actual difficulty due to human nature, as our eyes cannot easily scan so many typefaces together.

In general, use 2-3 fonts at most and choose them according to the tone of your message.

In Figure 20, you can see an example of how a font can harmonize with the tone of an infographic.



Fig. 20 - Example of a font used in an infographic according to its tone, by Collage Vintage.

Source: <https://collagevintage.com/2019/01/travel-guide-from-kyoto-to-tokyo/>

In conclusion, the use of typography helps in creating visual flow and hierarchy, but can also be used to give personality to a written content or visual element by building recognition for the related subject, for example a brand. In this sense, fonts are not just designed for readability. Each of them can communicate something. That's why we can talk about "font psychology". It refers to the kind of characters you decide to use in your graphic design, taking into account that fonts have specific characteristics associated with them that can evoke some meanings. In Figures 21 and 22, you can see how font psychology was used by Netflix.

# NETFLIX FONT PSYCHOLOGY

Fonts have different characteristics associated with them. How does typography on the posters for Netflix's top shows reflect their themes, genres and moods? How can fonts make shows seem more bingeable?

<b>Serif</b> Traditional, Respectable	<b>Sans Serif</b> Straight-forward, Sensible
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Create infographics at [venngage.com](https://venngage.com)

VENNGAGE

Fig. 21 - Example of font psychology applied to Netflix top shows by Sara McGuire.

Source: <https://venngage.com/blog/font-psychology/>



Fig. 22 - Detail of picture 21. Source: <https://venngage.com/blog/font-psychology/>

## Conclusions

The knowledge acquired with this lesson will allow us to design and implement User Interfaces and information visualizations that are usable and pleasant in layout, colours, and typography choices.