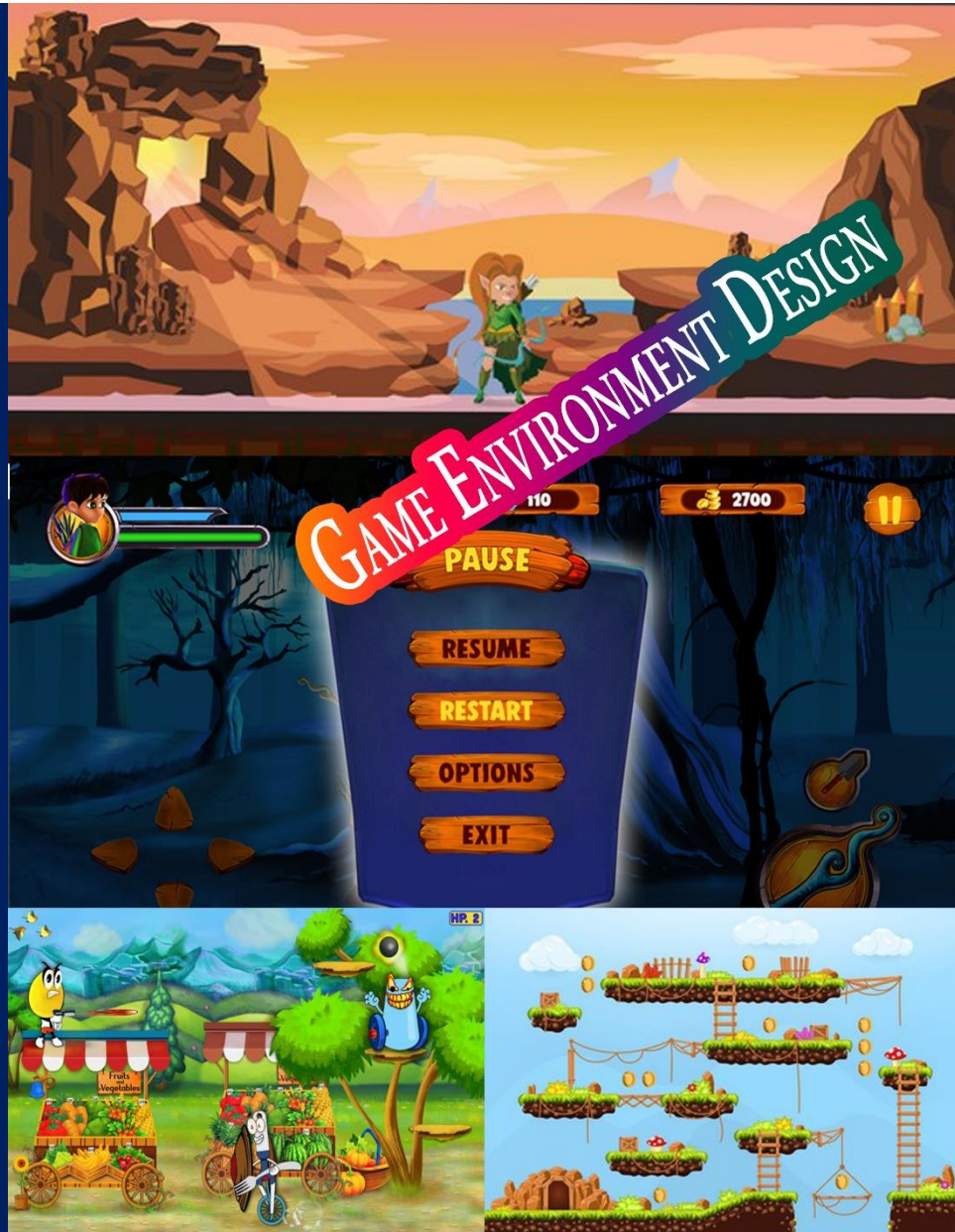


Game Environment Design



Title: Game Environment Design

By: Ali Akbary

Chapter 6 Game User Interface Design

Learning Outcome

Objectives of this chapter are: -

- User Interface Design
- Design Elements

WHAT IS GAME USER INTERFACE (UI)?

User Interface is basically the parts of the game that the user interacts with in order to play the game. It's everything about the controls and the screens that the player interacts with in order to play the game.



Figure 1 User Interface Example



Figure 2 User Interface Example



Figure 3 User Interface Example



Figure 4 User Interface Example



Figure 5 User Interface Example



Figure 6 User Interface Example



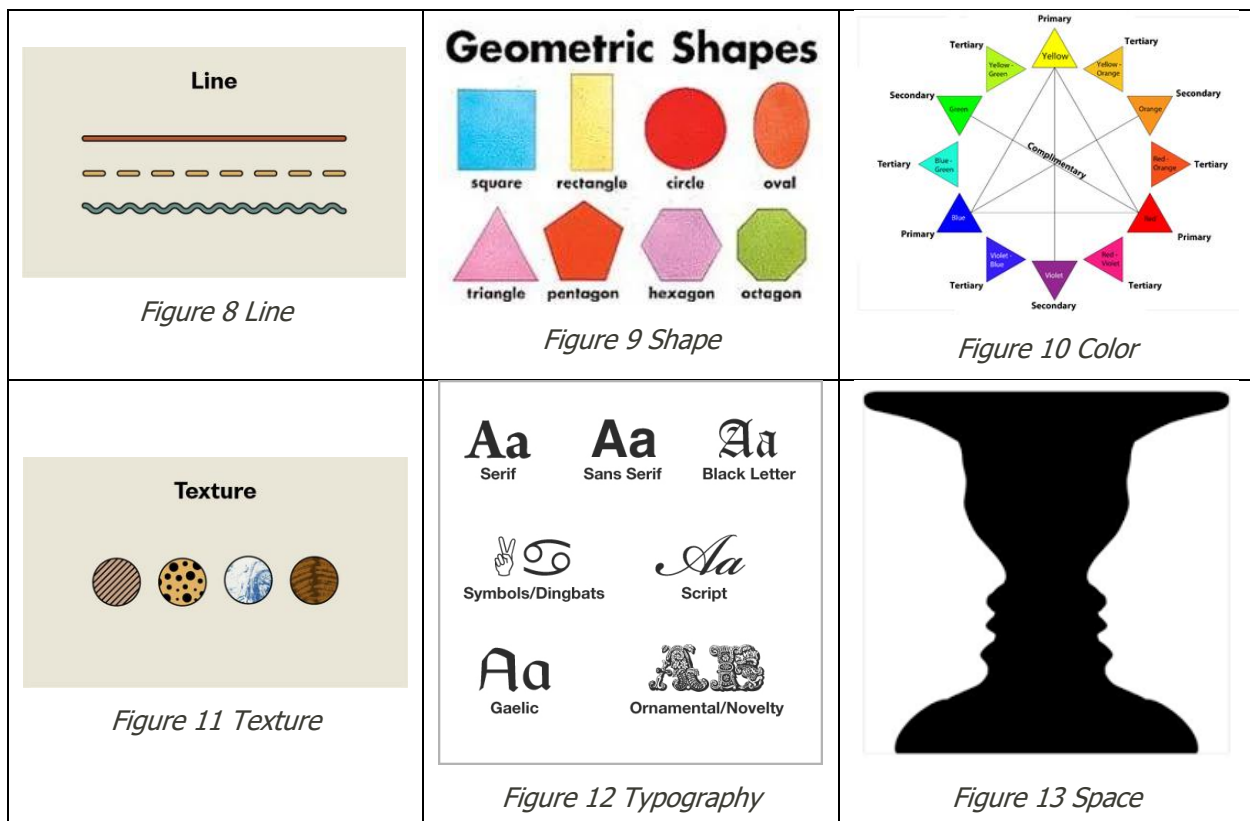
Figure 7 User Interface Example

BASIC ELEMENTS OF DESIGN

Creating beautiful design is about more than inspiration or a great idea, it's about understanding the fundamentals of the subject. Although it's possible to spend years studying the nuances of design and the many varying takes on how to be successful at it, there are a handful, or two, of basic elements that every designer should know before beginning any project.

Basic Elements of Design are: -

- Line
- Shape
- Color
- Texture
- Typography
- Space



Even amateurs in the field who maintain personal blogs or only make a hobby of it can utilize these following ten tips to create professional looking pieces, and anyone who intends to earn money from the endeavor must know them. Rules were made to be broken, of course, but you must know what they are first.

LINE

The first and most basic element of design is that of the line. In drawing, a line is the stroke of the pen or pencil but in graphic design, it is any two connected points. Lines are useful for dividing space and drawing the eye to a specific location. For example, think about how a magazine uses lines to separate content, headlines, and side panels.

Here are a few examples of what we traditionally think of when we think of lines: -

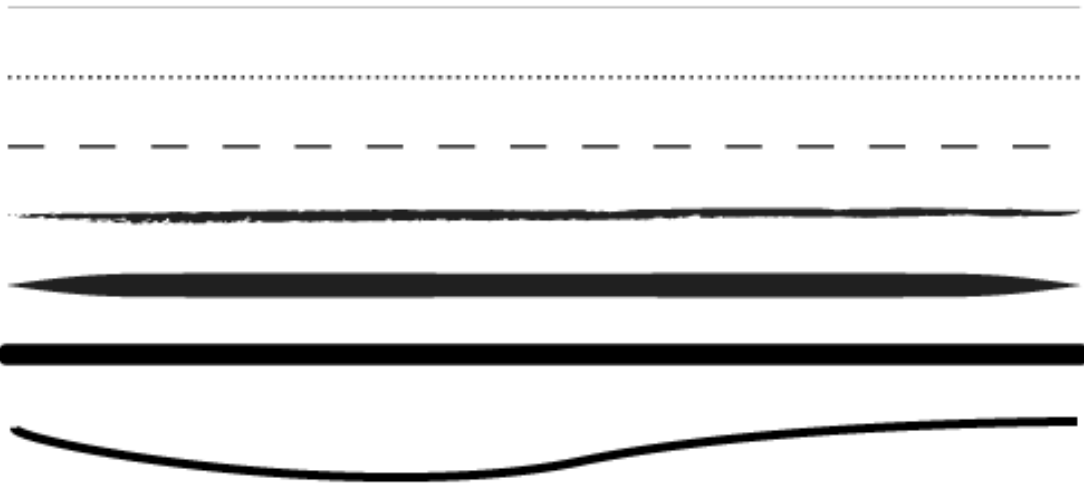


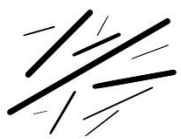
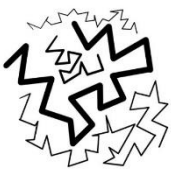
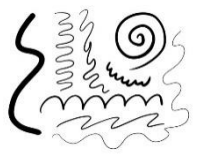


Figure 14 Lines

TYPES OF LINES

There are five Types of Lines in Art. Here are the Names: -

 <i>Figure 15 Vertical</i>	 <i>Figure 16 Horizontal</i>	 <i>Figure 17 Diagonal</i>	 <i>Figure 18 Zigzag</i>	 <i>Figure 19 Curved</i>
--	--	--	---	--

Vertical lines

Vertical lines are straight up and down lines that are moving in space without any slant and are perpendicular to horizontal lines. They suggest height and strength because they extend towards the sky and seem unshakeable.

Horizontal lines

Horizontal lines are straight lines parallel to the horizon that move from left to right. They suggest width, distance, calmness, and stability.

Diagonal Lines

Diagonal lines are straight lines that slant in any direction except horizontal or vertical. When in use, they suggest movement or lack of stability.

Zigzag Lines

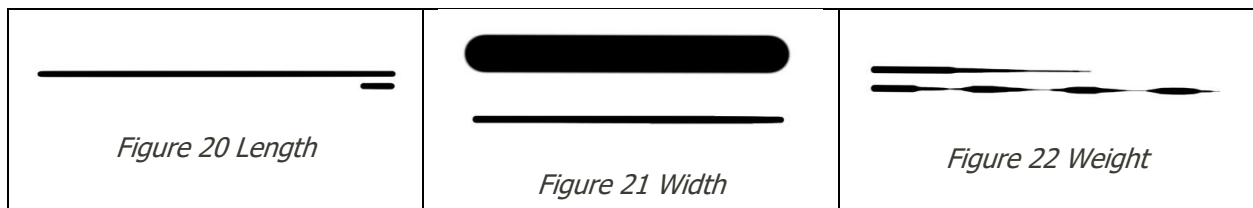
Zigzag lines are a series of diagonal lines joined at ends. They can convey action and excitement, as well as restlessness and anxiety.

Curved Lines

Curved lines are lines that bend and change direction gradually. They can be simply wavy or spiral. Such lines convey the feelings of comfort and ease, as well as sensual quality as they remind us of the human body.

HERE ARE THE VALUES ASSOCIATED WITH LINES

The 5 main types of lines are the beginning of all sorts of amazing and unique lines! To get more line variations, refer to tools such as length, width, weight, texture, style, direction, the degree of curve or all the above combined.



Length - Length in lines can be long (tall, strong, far) or short (small, cute, close).

Width - Width in lines goes from thin (delicate, slim, lightweight) to thick (strength, weight, power).

Weight - Weight in lines means the continuous change of width. By varying the weight, one can capture energy, movement and even suggest when one object is in front of the other.

STYLE OF THE LINE

Style of lines refers to continuous, dotted, dashed, or implied lines. Continuous or implied lines are great for leading the eye of the viewer in the direction you want them to go. Dashed or dotted lines are great for patterns, energy and calling for attention.

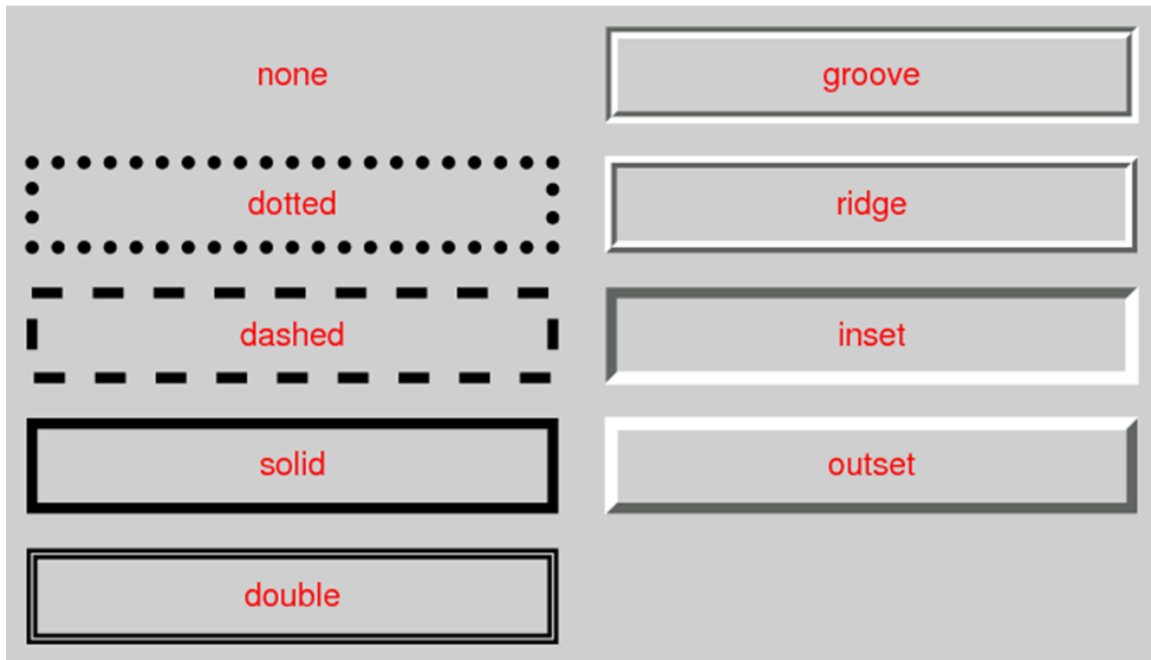


Figure 23 Border line style

SHAPE

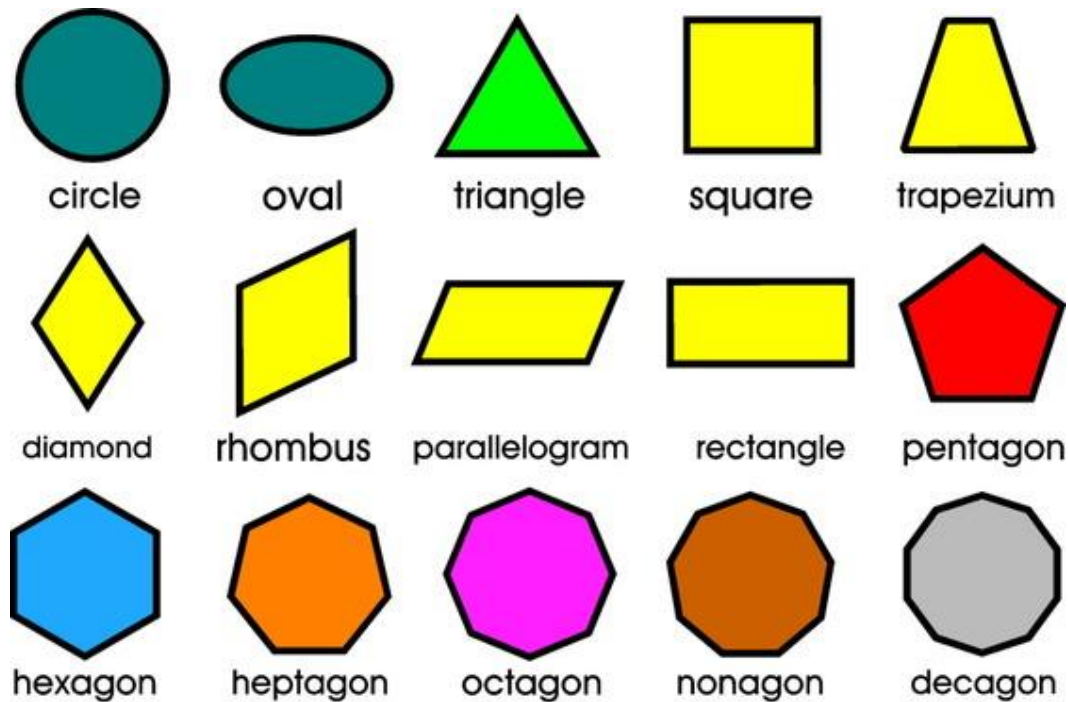


Figure 24 Shapes

Shapes, geometric or organic, add interest. Shapes are defined by boundaries, such as a lines or color, and they are often used to emphasize a portion of the page. Everything is ultimately a shape, so you must always think in terms of how the various elements of your design are creating shapes, and how those shapes are interacting.

CIRCLES

Circle geometric shapes represent continuity, the eternal whole because they have no beginning or end. In every culture, circles illustrate the sun, the earth, the moon, and other celestial objects.

Their completeness suggests harmony, warmth, and gives us a sense of calm. Circles also help us portray movement in visuals and are used to indicate familiar objects like wheels, balls, or different fruits, like oranges and grapefruits.

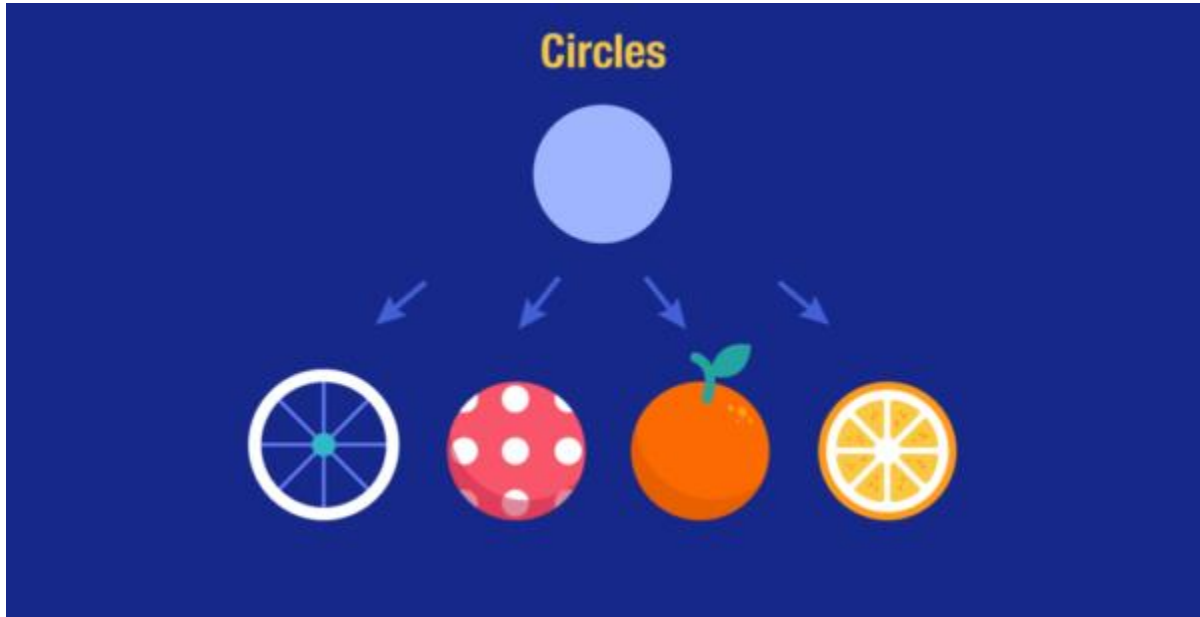


Figure 25 Circles shapes

SQUARES AND RECTANGLES

Square geometric shapes are the most encountered. These shapes are familiar to the eye, and it is easy to use them as a frame or as a base for designs. Because these shapes are not usually the focus of a visual, they are used to give a sense of stability. The angles suggest a mathematical order.

Squares and rectangles suggest peacefulness, security, and a sense of conformity. When we draw a house, we start with a square.

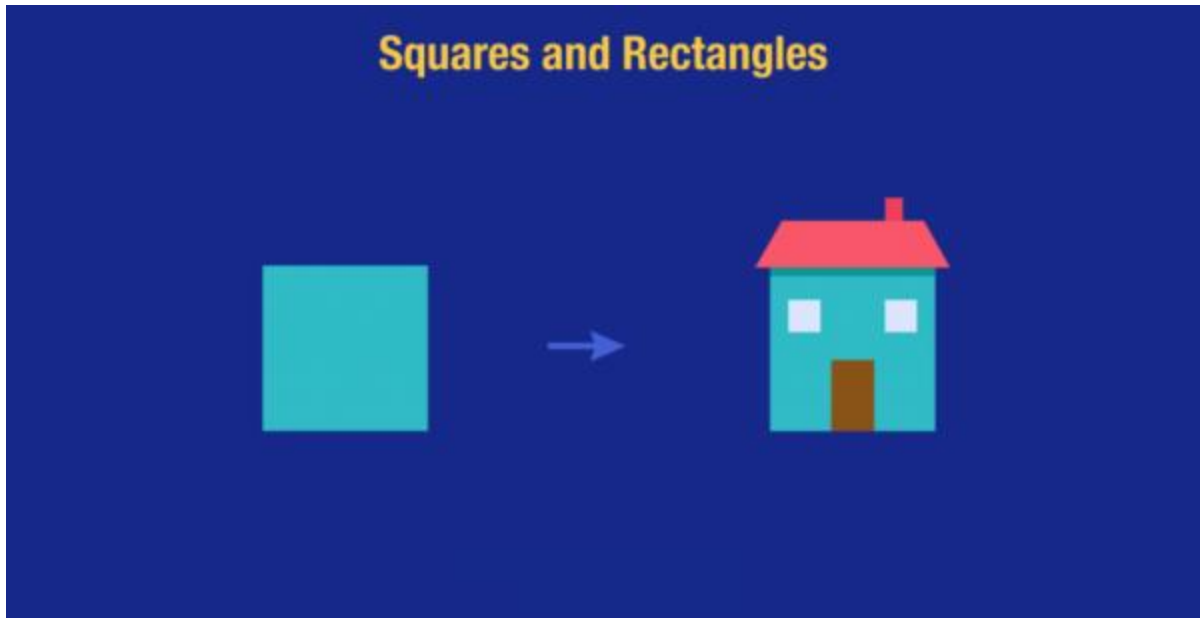


Figure 26 squares and rectangles

Sometimes, we may think that squares or rectangles are bland shapes that do not get noticed, but with the right strategy, they can be as effective as any other shape.

To make a visual stand out with these shapes, you may consider an old-school pixelated form of design, meaning lots of squares put together. Like this: -



Figure 27 creating picture using squares and rectangles.

TRIANGLES

Triangle geometric shapes can show stability and power when pointing up or instability and conflict when facing down.

They hold energy like no other shape and can symbolize the spiritual trinity with the union of body, mind, and spirit. They can also illustrate self-discovery.

There are other triangle shape meanings in graphic design, such as dynamism and improvement.

When choosing this shape, it is always better to use it sitting on its base, or with the point facing right, to suggest the forward movement. Otherwise, it may send negative vibes, as the Western culture believes.

A few examples from the digital world that symbolize the movement through triangles are the play symbol, fast forward, or reverse symbols, which have the triangle shape.

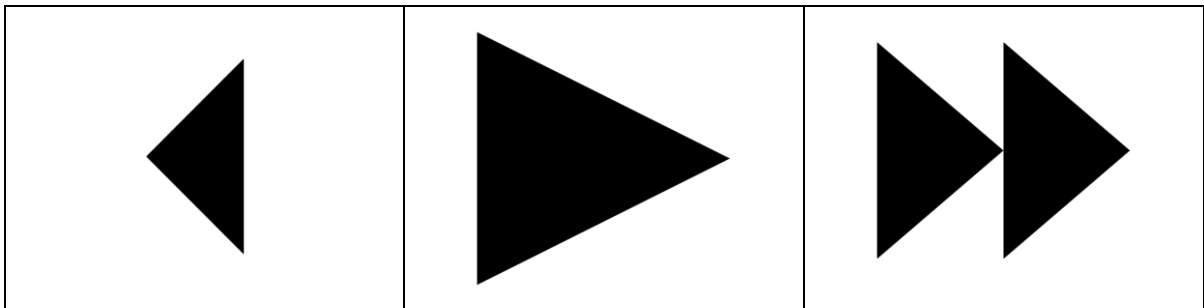


Figure 28 Triangles shapes

Triangles can be used to suggest familiar forms like pyramids, mountains, or pennants. If the triangle is skinny, it portrays an arrow.

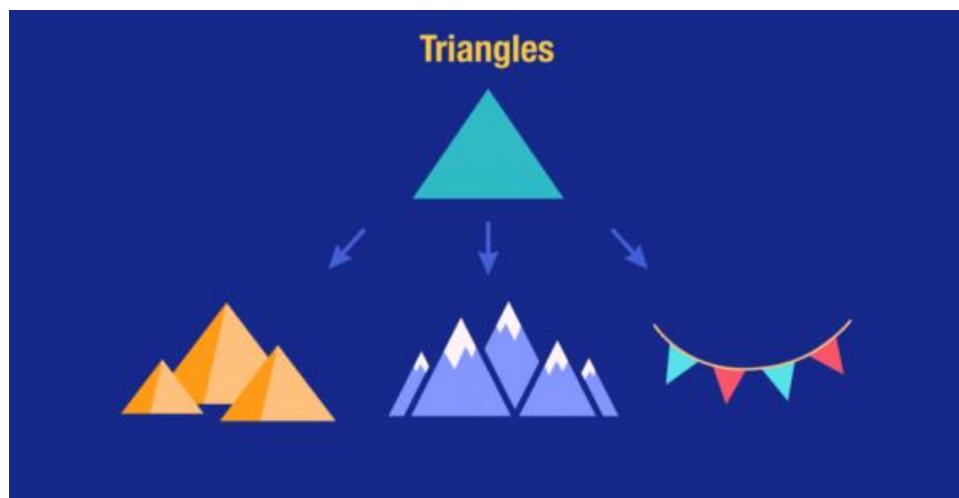


Figure 29 triangles shapes

PENTAGONS, HEXAGONS, AND OCTAGONS

Among the polygon shapes with more than four sides used in design, pentagons, hexagons, and octagons are the most common. These shapes are part of our everyday life, and we are so used to them that we can immediately associate a shape with a symbol.

For example, The Pentagon Building in the US (pentagon shape), floor tiles, or sections of a beehive (hexagon shapes), the stop sign, or an open umbrella (octagon shapes) are easily recognizable.



Figure 30 Pentagons, hexagons, and octagons

All these shapes can be used as a puzzle and create infographics, as they offer a professional look and feel.



Figure 31 create infographics using other shapes.

COLOR

Color is one of the most obvious elements of design, for both the user and the designer. It can stand alone, as a background, or be applied to other elements, like lines, shapes, textures, or typography. Color creates a mood within the piece and tells a story about the brand. Every color says something different, and combinations can alter that impression further.

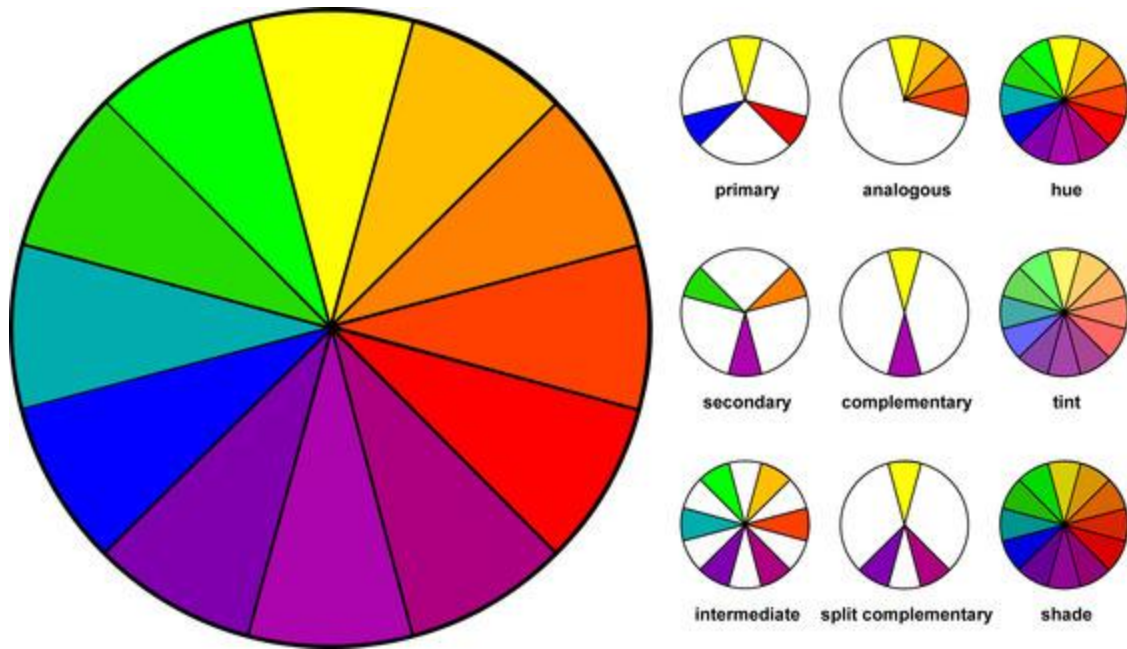


Figure 32 Colors

PRIMARY COLOR

Primary colors are the three colors that make all other colors. They are Red, Blue, and Yellow. These three colors can be used to create the next level of colors, called the secondary colors.



Figure 33 Primary colors

SECONDARY COLOR

Secondary colors are purple, green, and orange. They are created using the primary colors. If you look on the color wheel, you will find the secondary colors in between two primary colors.

Color Guide: -

- Red + Blue = Purple
- Blue + Yellow = Green
- Red + Yellow = Orange



Figure 34 Secondary color

TERTIARY COLOR

Tertiary colors take secondary colors one step further. They are the "two-name" colors, such as red-purple, red-orange, yellow - green, etc.



Figure 35 Tertiary color

They are created by adding more of one primary color than the other creating not a true secondary color. It ends up being closer to the primary color.

We can take this idea further and mix primary with secondary colors—again by blending colors that lie next to each other on the wheel.

After finishing this declination, you get the following:

- Chartreuse: yellow - green
- Amber: yellow - orange

- Vermilion: red - orange
- Magenta: red - purple
- Violet: blue - purple
- Teal: blue - green

Note that the secondary color follows the primary color in this notation.

NAMES ASSOCIATED WITH COLOR IN DESIGN

Color theory is the collection of rules and guidelines which designers use to communicate with users through appealing color schemes in visual interfaces. To pick the best colors every time, designers use a color wheel and refer to extensive collected knowledge about human optical ability, psychology, culture and more.

These are phrases refers to color.

- Color
- Hue
- Tint, Shade & Tone
- Value
- Saturation / Chroma
- Color Wheel
- Matching Colors
- Monochromatic
- Types of Color
- Matching Colors
- Emphasis
- Color Consistency
- Color Meanings
- Color Relativity

Color

Color (North American English), or colour (Commonwealth English), is the characteristic of visual perception described through color categories, with names such as red, orange, yellow, green, blue, or purple. This perception of color derives from the stimulation of photoreceptor cells, in particular cone cells in the human eye and other vertebrate eyes. This reflection is governed by the object's physical properties such as light absorption, emission spectra, etc.



Figure 36 Color

Pure Color or Hue

Primary, secondary, and tertiary colors, without the addition of white, black, or a third color, are pure (or saturated) colors. They are intense, bright, cheery, and untainted colors.

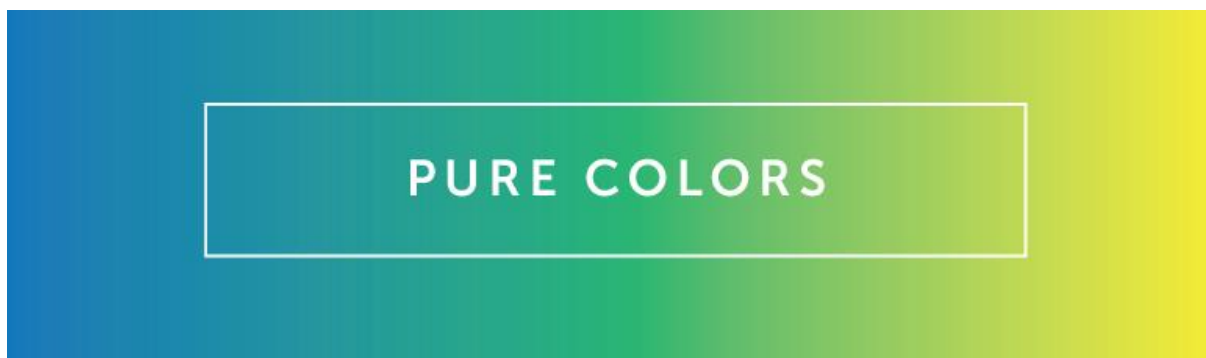


Figure 37 Pure color

A hue is any color on the color wheel. A lot of the time when people talk about colors, they are talking about hues which are the basic, "pure" colors, any color that is within the visible light spectrum. The healthy human eye can see 2.3M hues; tons of variations of reds, blues, greens and so on.

Tint, Shade & Tone

Hues do not have tint or shade, which means they lack any additions of white or black. That is why we are talking about tints and shades of hues.

Tints

Tint is about the amount of white in a color. When you mix a color with white you are tinting it. More white leads to increased lightness of the hue. Adding white to the pure hue decreases its saturation, making the hue less intense.

When white is added to a pure color, you get a tint. Some people refer to these as pastel colors. They are lighter and paler than a pure color, and not as intense.

Tints range from slightly whiter to almost - white.



Figure 38 Tints

Shades

Shade on the other hand is about the amount of black in a color. When you mix a color with black you are shading it. This results in a rich, often darker, more intense color due to the overpowering nature of black pigments. Many blacks change the characteristics of a hue, even though small amounts. Therefore, they should be used sparingly.

When black is added to a pure color, you create a shade. These darken and dull the brightness of pure colors and range from slightly darker to almost black.



Figure 39 Shades

Tones

We speak of creating tones when we mix a hue with gray, meaning that you effectively tint and shade at the same time. Tones can be lighter or darker than the original hue—depending on the amount of white and black added. They will also appear less saturated and intense than the original hue. Tones can reveal subtle and complex qualities in a hue and are closer representations to the way we see the “real” world.

When gray (black + white) is added to a pure color, you create a tone. You often hear people saying that a color needs to be “toned down”, meaning it is too intense and they want to drop the level of intensity.

Adding black and white in different amounts to a color subdues the intensity quickly.



Figure 40 Tones

Value

Value is the lightness or darkness of a hue. Values are very crucial for professional results. In a way, they are much more important to get correct than choosing a hue. When we say some color is brighter or darker, we are talking about the value of a hue. This tells us how close it is to its lightest or darkest version. A value scale is like a gray scale for a particular hue.

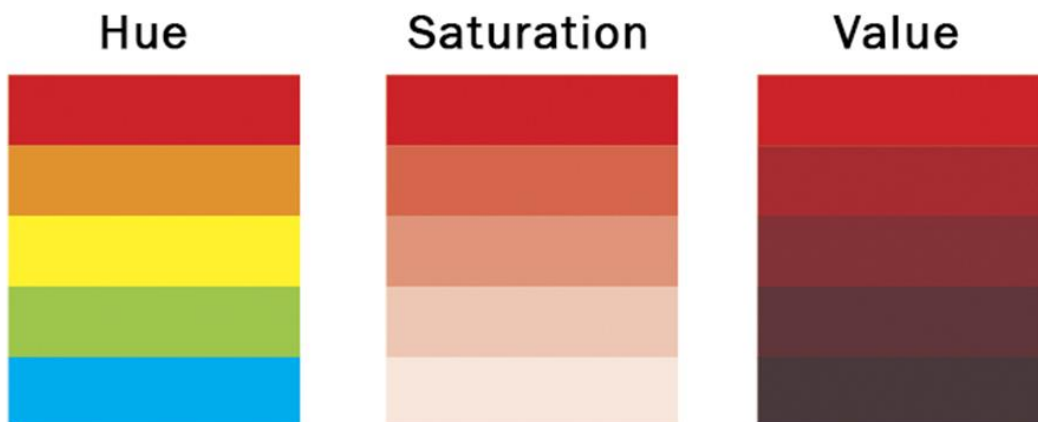


Figure 41 Hue, Saturation, and Value (HSV)

Saturation / Chroma

Saturation, also called chroma, is another concept we should not overlook. This is the “colorfulness” or purity of a hue. These funky terms really translate down to the intensity or brilliance of a perceived color. The chroma is defining how pure the hue is.

Saturation

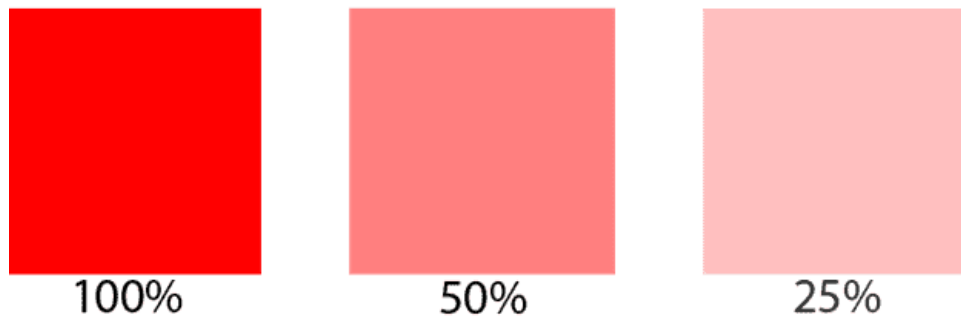


Figure 42 Saturation

Analogous Colors

Analogous colors are adjacent on the color wheel, right next to each other. They form a simple relationship and are usually very easy on the eyes, creating a peaceful, comfortable mood. How so? Most likely because this color combination can often be seen in nature.

Analogous

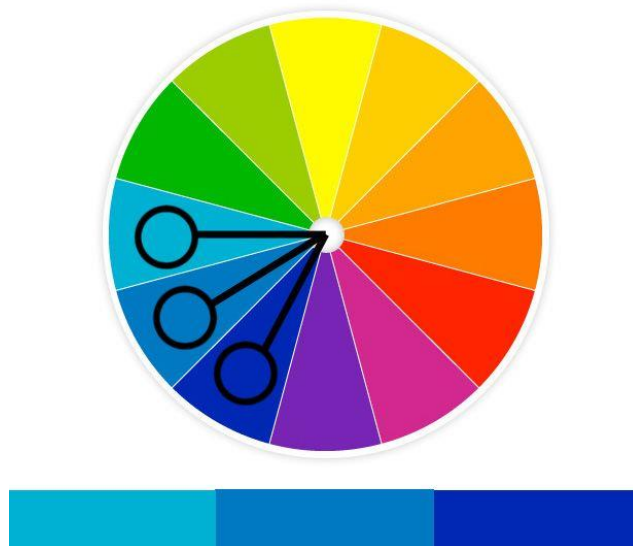


Figure 43 Analogous Colors

Complementary Colors

On the color wheel, complementary colors oppose each other. Complementary colors are a very popular combination as they please the eyes “naturally”. Red and green are especially popular.

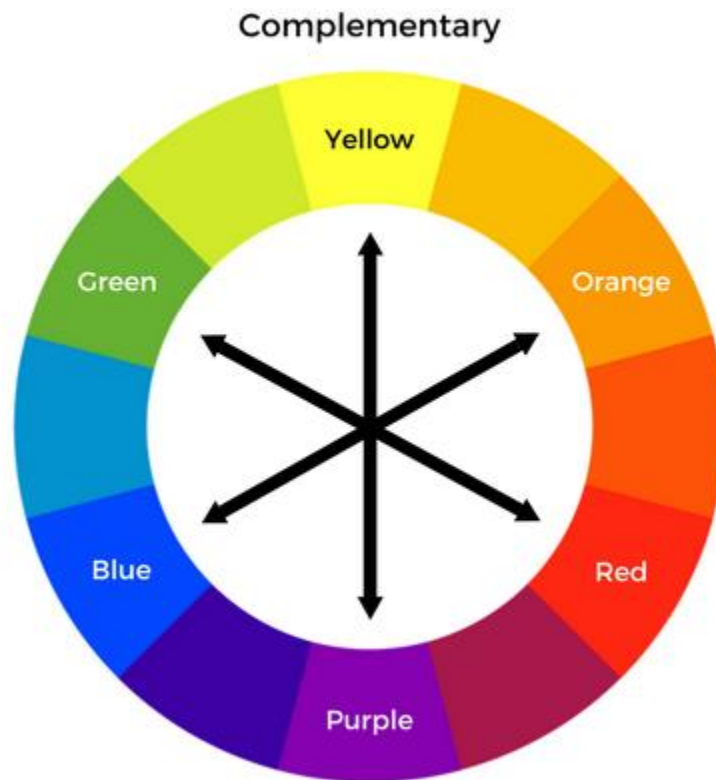


Figure 44 Complementary color

Think of color combinations like matching serif and sans-serif typefaces. A balance is important here. Complementary colors are also able to create the strongest color contrast for each hue.

Triadic Colors

Triadic colors are placed equidistant on the color wheel. They present a bit more of an advanced combination and using these is difficult for beginners to get right I think—but do not let me stop you. The more you practice, etc.

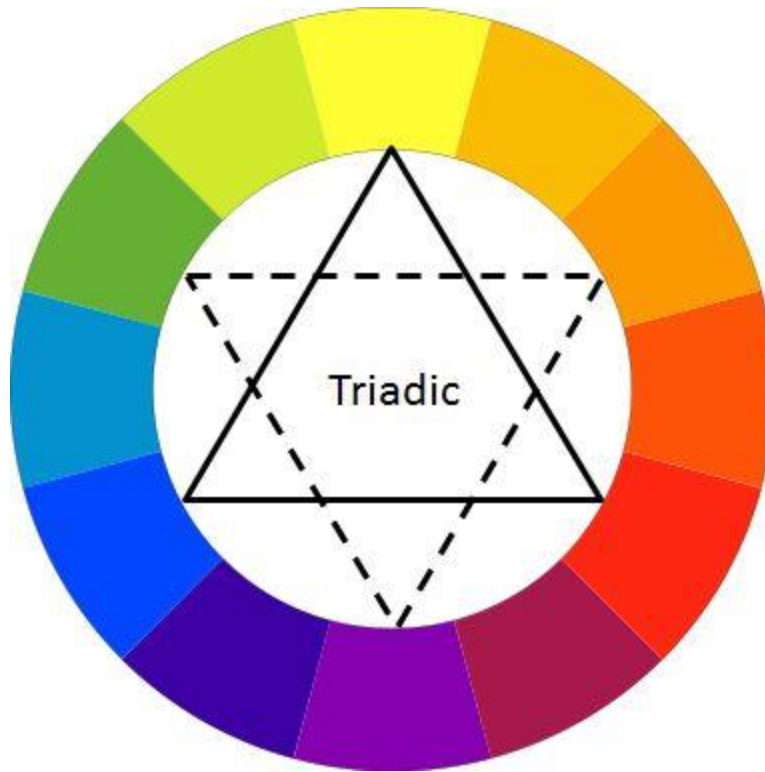


Figure 45 Triadic

They are often good for cartoons and surreal scenes and can imply a certain playfulness.

TEXTURE

Texture is an element of design that defines the surfaces of shapes and forms. Texture that you feel with your fingers is called tactile while texture that the artist recreates on a flat surface is called visual texture. Tactile texture is three-dimensional (3D) because it has height, width and depth. Visual texture is two-dimensional (2D) because it lacks actual depth.

Texture can be smooth like plastic or rough like sandpaper. It can be marshmallow soft or rock hard. You can often imagine just how each surface feels in a photograph. For example, in the photograph below, you can see that the differences in texture between the smooth mother horse's coat and the curlier foal's fur. You know that the grass feels springy and the smooth-looking mountain in the background is actually hard and rough.



Figure 46 Example for texture

Texture refers to the surface quality in a work of art. We associate textures with the way that things look or feel. Everything has some type of texture. We describe things as being rough, smooth, silky, shiny, fuzzy and so on. Some things feel just as they appear; this is called real or actual texture. Some things look like they are rough but are actually smooth. Texture that is created to look like something it is not, is called visual or implied texture.

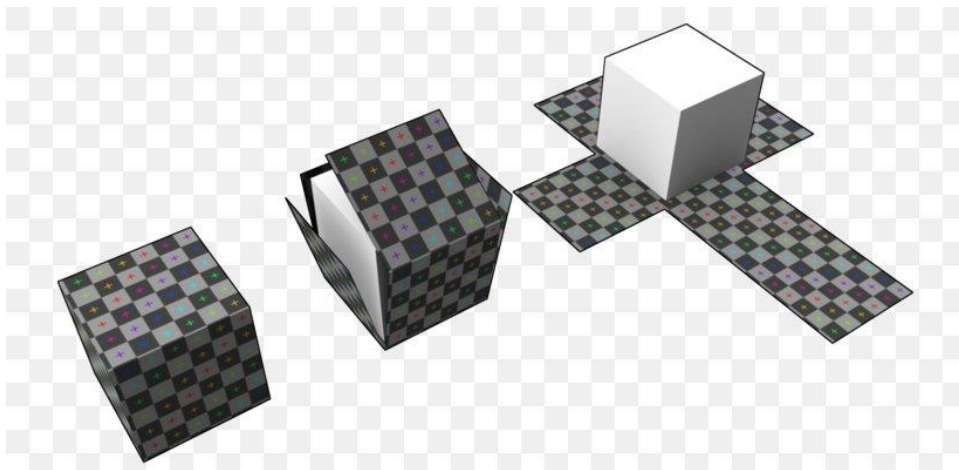


Figure 47 Texture map in 3D

It is counter-intuitive to think about texture when the piece is not ever going to be touched. Websites and graphic design do rely on the look and impression of texture on the screen, however. Textures can create a more three-dimensional (3D) appearance on this two-dimensional (2D) surface. It also helps build an immersive world.

Texture packs like these make it much easier to try subtle touches of visual interest:

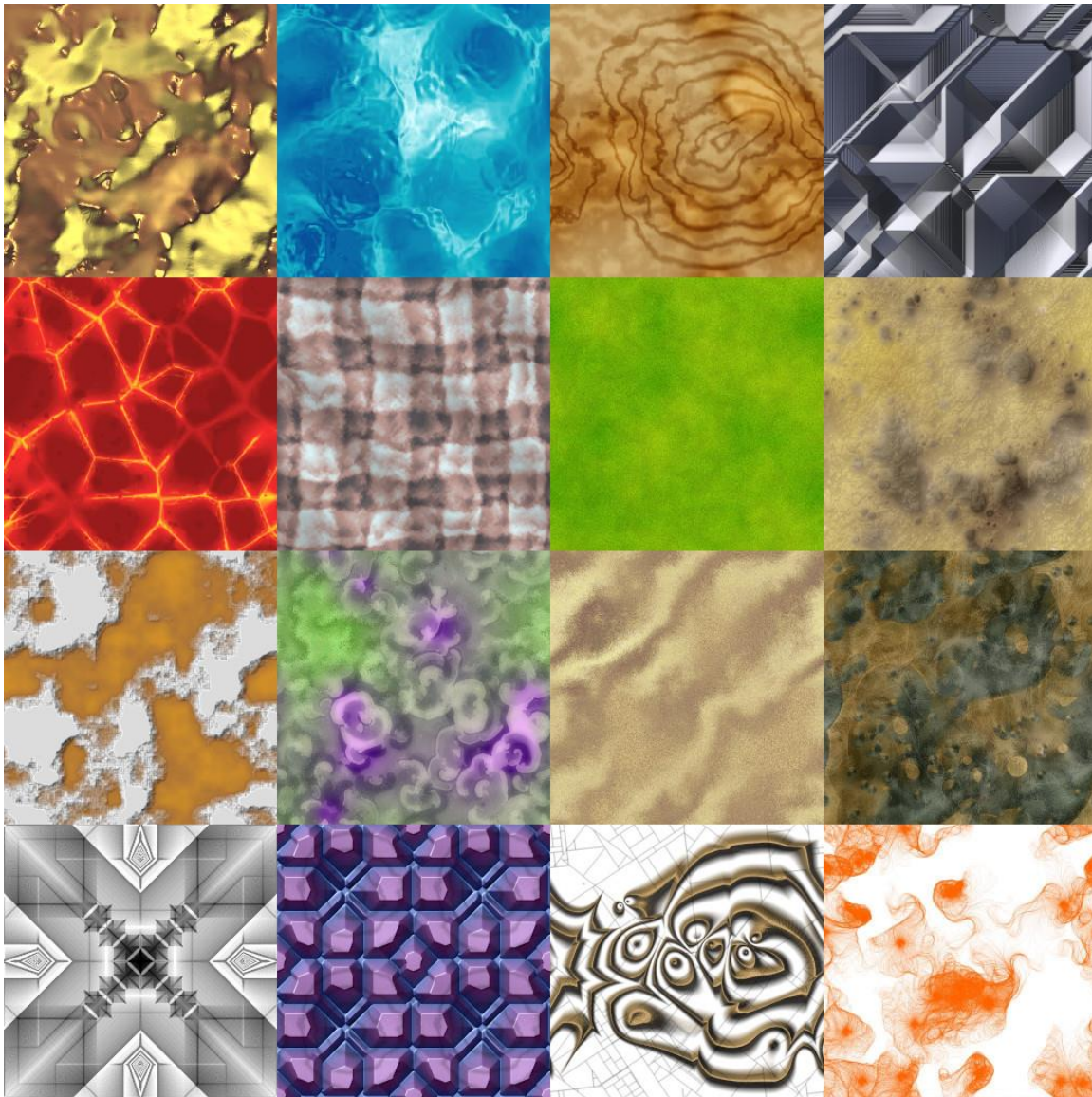


Figure 48 Texture

TYPOGRAPHY

Perhaps the single most important part of graphic and web design is [typography](#). Like color, texture, and shapes, the fonts you use tell readers you are a serious online news magazine, a playful food blog or a vintage tea tins shop. Words are important, but the style of the words is equally essential.

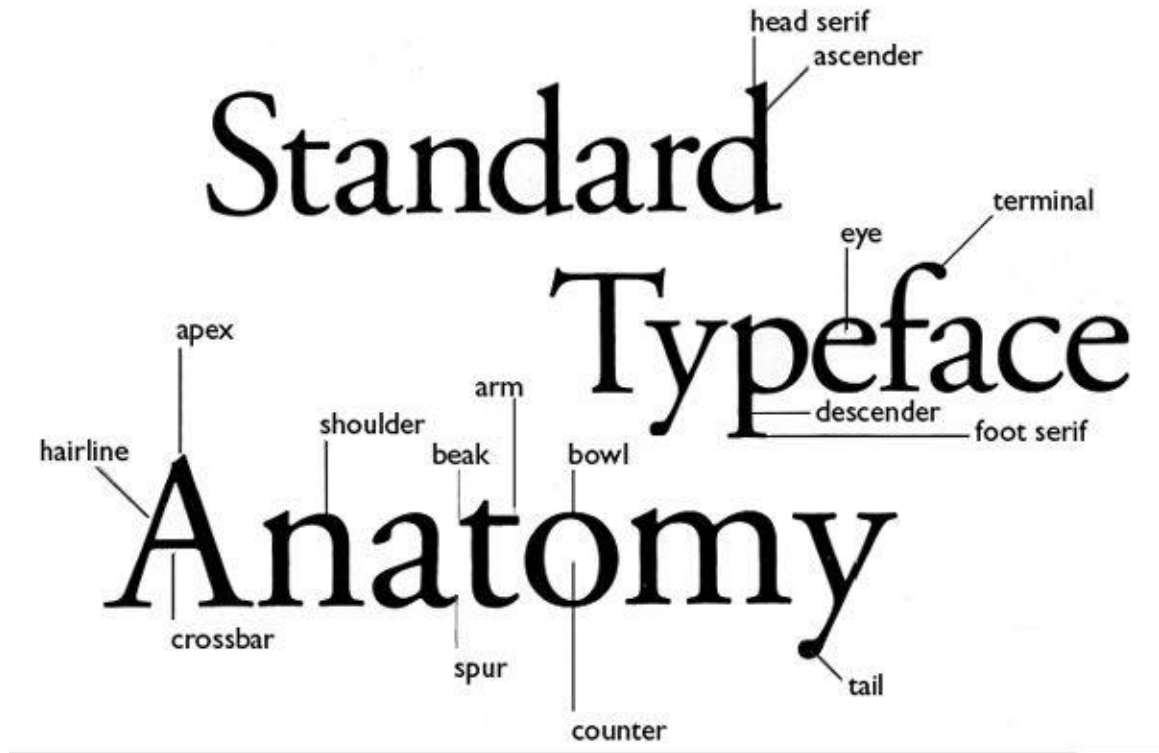


Figure 49 Typography

WHAT IS TYPOGRAPHY?

Typography is the visual component of the written word. A text is a sequence of words. A text stays the same no matter how it is rendered.

Typography is an art form of words and text all around us. The graphic designers who are the ones deciding how it will look, in our brochures, our logos, our websites and so on. The better understand the typography, the more effective our designs will be.

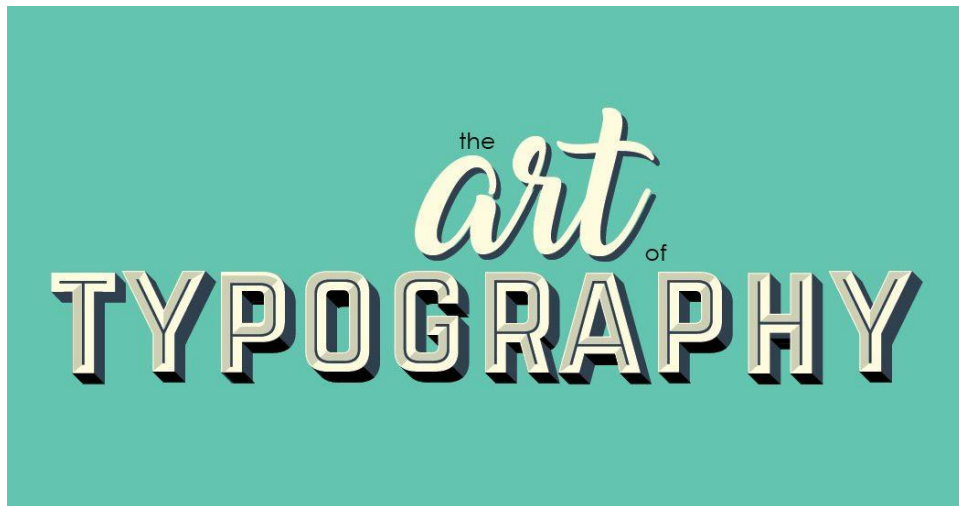


Figure 50 Art of typography

Good typography comes from paying attention to tiny details as this can make the difference between graphic design work that is just acceptable or good. There is more to it than just choosing fonts and making copy look good, it is also about making things legible and readable (some of most basic functions of good typography) as well as making layouts look good in an aesthetic way.

THE TERMS RELATED TO TYPOGRAPHY

The following is an explanation of some common areas of typography.

Typeface or font?

First, let us talk about the difference between a font and a typeface. We might often use these terms interchangeably, but there is a difference.

A typeface refers to the specific design of the letters, like Times New Roman or Helvetica. A font refers to a particular style or size of a typeface, for example, Bold, Italic, Bold Italic or Regular. E.g., 10-point regular or 24-point bold.

As you can imagine, we have adopted a lot of our terminology from printmaking. So, in those days' font referred to literal metal pieces used in a print machine, while typeface referred to the bigger family of fonts. Today, they are practically synonyms, but it is good to keep this distinction in mind.

Typeface	Font
The specific design of the letters.	A particular style or size of a typeface.
Times New Roman Helvetica	10 point bold Helvetica Light

Figure 51 Typeface Vs Font

Typeface classifications

There are many different classifications and sub-classification of typefaces, but the most common two types you will hear of are: Serif – these typefaces are the more traditional ones. They are distinguished by a short line or finishing stroke on the end of character strokes and stems (shown in the anatomy diagram below) and Sans-serif – as the name suggests, these are distinguished by their lack of any Serifs. They only became popular in the nineteenth century and are considered modern as a result.

Serif

A serif is a short line or stroke attached to or extending from the open ends of a letterform. It also refers to the general category of typefaces that have been designed with this feature.



Figure 52 Serif and Sans-Serif

Sans Serif

Sans Serif is the general category of typefaces (or an individual typeface) designed without serifs.

When we start learning typography, this is one of the easiest distinctions to pick up first. We typically use sans serif.

TERMS REFER TO TYPOGRAPHY.

These are some of the basic parts of the anatomy of typographic characters. There are lots more (which you can find out about here on [Fonts.com](https://www.fonts.com)) but I think it is better to start with a few first.

Character

A character is an individual symbol of the full character set that makes up a typeface. It may take the form of a letter, number, punctuation mark, etc.



Figure 53 Character

Ascender and Descender

A descender is a piece of a letter that extends below the baseline, while an ascender is a part of a lowercase letter that rises above the main body of the letter, or above the x-height.

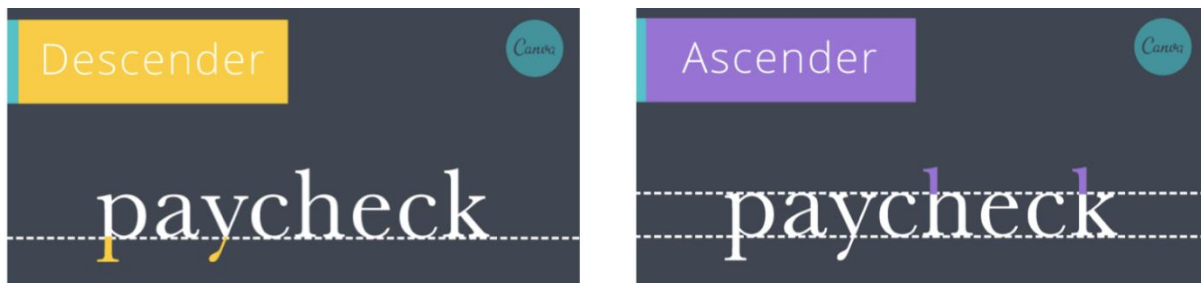


Figure 54 Ascender and Descender

Italics

Italics refers to a slanted version of a typeface (slants from left to right). A true italic is uniquely designed, more than a tilted version of the upright (i.e., roman) typeface. So, on the left-hand side, we can see a titled font and, on the right, we have a true italic.



Figure 55 Italic

Bold

Bold, bold face, or bold font is any text that is darkened to help emphasize a remark or comment. For example, this is bold text. If your browser supports bold text, the previous words "bold text" is in bold lettering.

Typography Part 2

Creating contrast using same or similar typefaces

Regular and lower case

JOHNdoe

Bold and uppercase

Explanation:
This creates contrast at the same time it is easy to read and eye pleasing.

Fonts used:
Bold and uppercase: Futura Medium
Regular and lower case: Futura

Case Studies:

PayPal™

Explanation:
PayPal logo uses colors to create contrast using the same italic typeface.

Piktochart

Explanation:
Piktochart logo uses the concept of bold and light font to create contrast.

Figure 56 Using Bold.

Baseline

Moving on to some more spacing related terms, we will start with a baseline. The baseline is the imaginary line where most letters and other characters sit.



Figure 57 Baseline

Cap Line

Then we have the cap line, which is the imaginary line that marks the upper boundary of capital letters and some lowercase letters' ascenders.



Figure 58 Cap Line

X-Height

The x-height refers to the height of a typeface's lowercase letters. It is also what we use to distinguish between ascenders and descenders.

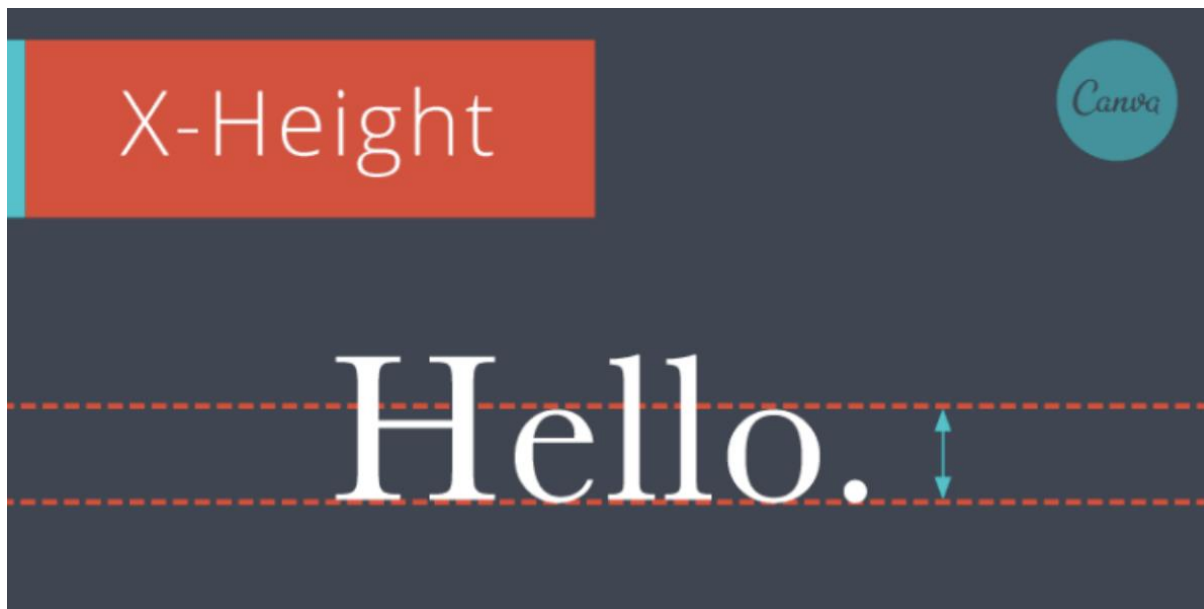


Figure 59 X-Height

Kerning

Kerning refers to the horizontal spacing between two consecutive characters; adjusting the kerning creates the appearance of uniformity and reduces gaps of white space between certain letter combinations.

You will not need to adjust kerning because the typeface designer will already account for that.



Figure 60 Kerning

Tracking



Figure 61 Tracking

Tracking refers to the uniform amount of spacing between characters in a complete section of text (sentence, line, paragraph, page, etc.).

Leading

Leading is the vertical spacing between lines of text from baseline to baseline.

While there are more terms, these ones will get you far in typography. I do not expect you to memorize all of them at once. As you continue to work with and use typography in your designs, you will find yourself reaching for these terms to help describe what you are thinking about. Through that repetition and practice, you will pick them up in no time.



Figure 62 leading

Alignment

Generally, text should be left aligned, simply because we are used to reading that way. Without good reason, only consider centering or right aligning text if it is a small amount, such as a heading or caption. Also, justifying text (where it has a straight edge on both sides) should be used in moderation too. It looks nice and neat in some situations, but too much of it will make a layout look rigid. Additionally, justifying in a small column size can cause irregular spacing as between words as the software attempts to adjust your text to fit.

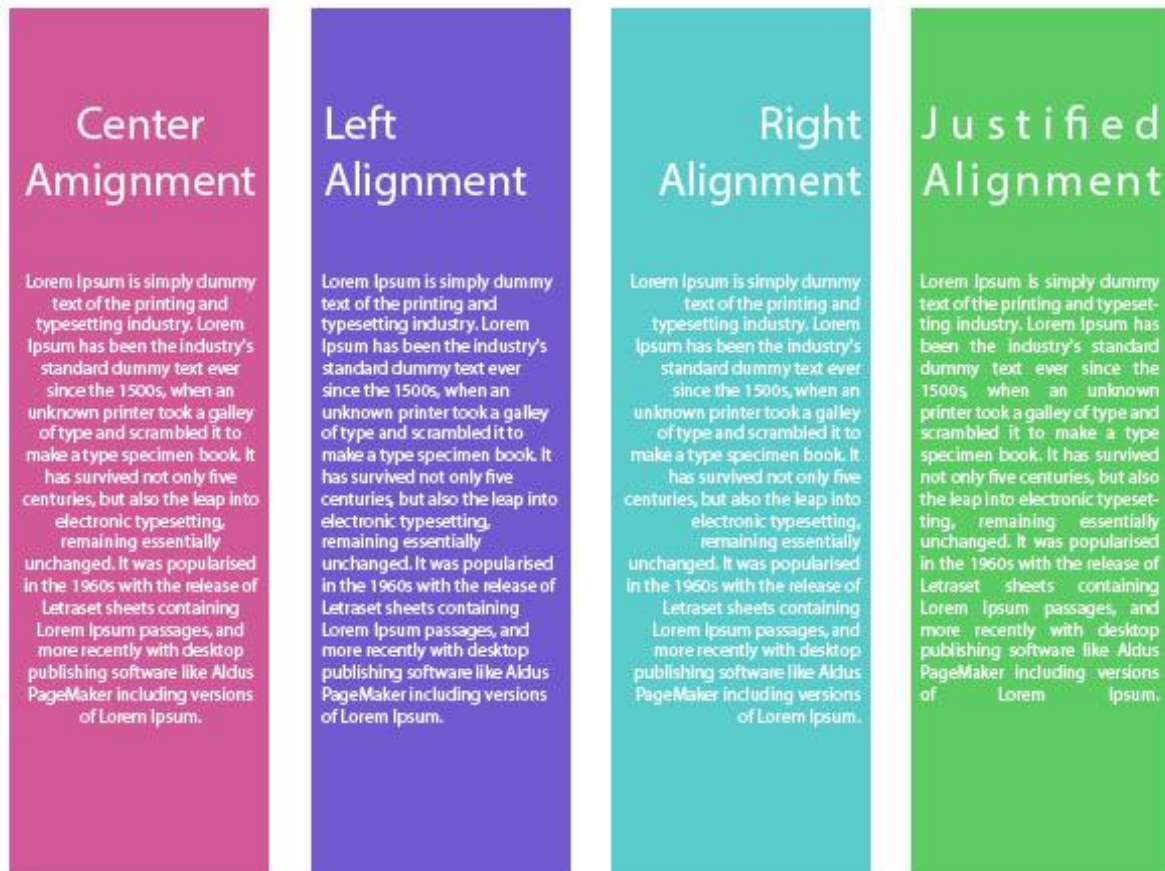


Figure 63 Text Alignment.

SPACE

Negative space is one of the most underutilized and misunderstood aspects of designing for the page. The parts of the site that are left blank, whether that is white or some other color, help to create an overall image. Use negative space to create shapes as you would any other element. Check out this article if you are interested in learning more about frequently used design terms like negative space.

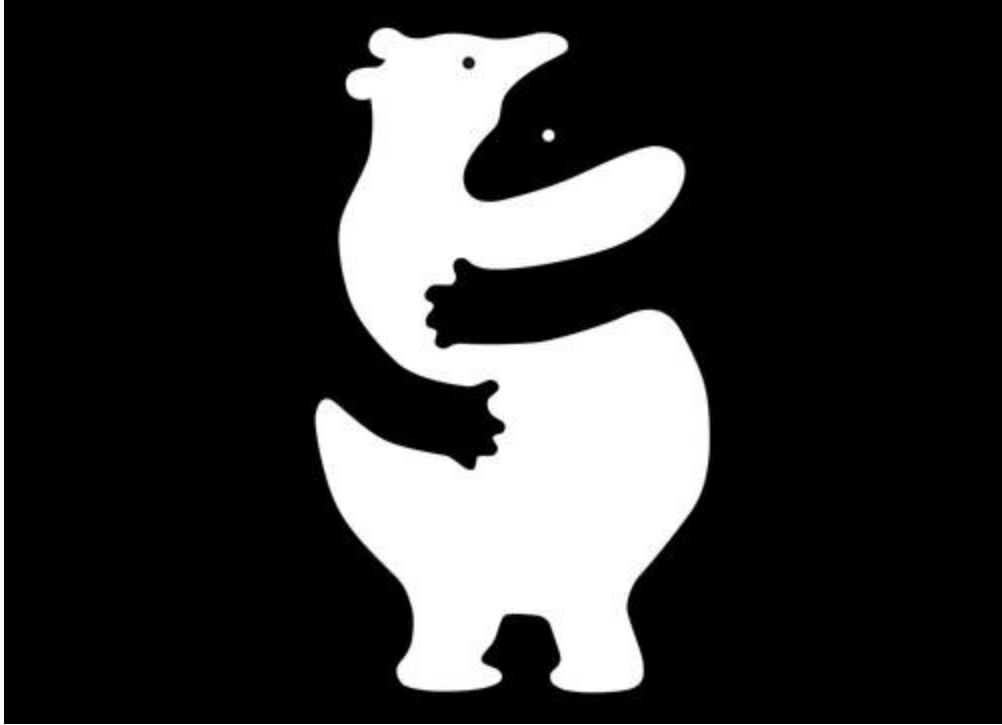


Figure 64 Space