Design Project 2

Designing instructional materials, assignments and activities as a Foundation course module for ‘Colour Theory’ for Design Schools

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Project Type: Instructional Design, Design Education

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Declaration

I declare that this written document represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/ source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Project Approval

The Design Project II titled “Designing instructional materials, assignments, activities as a Foundation module for Colour Theory for Design Schools” by Shweta Ratanpura, Roll Number 216330016 is approved, in partial fulfilment of the Masters Degree in Design at the IDC School of Design, Indian Institute of Technology Bombay.

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I would like to express my gratitude to Professor BK Chakravarthy for helping me structure my project outcome as part of the HASMED[1] course and to be given the opportunity to interact with and evaluate my project with so many young students! This was only made possible due to Professor Anirudha Joshi and Professor Girish Dalvi recommending me as a Teaching Assistant for the HASMED[1] course.

I am also thankful to all my batchmates, for helping me throughout the project and constantly motivating me.

Abstract

Today’s Design students have grown up familiar with digital media, and are quick to use digital tools in their study and practice. The purpose of this project is to use existing teaching methods in combination with emerging technologies to improve the learning experience in a classroom setting for Design students.

The project focuses on developing a new methodology for teaching Colour Theory that incorporates the classic theories rooted in the Bauhaus School - into a digital and interactive environment.

By utilising emerging technologies, we can not only expand on the ability to teach the subject of Colour efficiently but also effectively, and in line with today’s trend of digital output. Students could quickly learn about the interaction of colour, and experience the concepts of traditional colour theory curriculum in digital formats that they are familiar with.

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PROJECT DESCRIPTION

Summary / Overview: Design Education in India as of now does not commonly follow a set structure for its curriculum. While some universities do follow the UGC guidelines, it only provides a brief description of the topics to be covered and what the course objective should be. The aim of this project is to design detailed course content, lesson plan, related assignments and activities, compiled reading and reference material, as well as the evaluation criteria. I chose Colour Theory as the topic since it is an essential Foundation level course at design schools and its applications extend into all branches of design.

Aims / Objectives: The main objective of the project is to create an instructional package for instructors which will aid design students in their Foundation year - with learning and understanding of Colour Theory and its application. The focus is to create an interactive digital module for easier and faster learning as opposed to traditional paint-paper based activities which are still the norm at various design schools in India

Scope: The project would specifically serve students in the foundation year of design schools across India and faculties teaching the Colour Theory module to these students

Approach(s) / Method(s):

Primary research -

1. Interaction with faculties and professors teaching Colour Theory at different design schools - existing syllabus, important topics, what students struggle with
2. Interaction with students who have already studied Colour Theory - pain points, what's missing, are they able to successfully apply their learnings
3. Interaction with design practitioners in the industry

Secondary Research -

1. Study of lesson plans, course syllabus for Colour Theory module taught at art/design schools across the world
2. Books, papers, articles on relevant topics associated with Colour Theory, Pedagogy, Design Education

Evaluation: Unmoderated usability testing

As a Teaching Assistant for the HASMED[1] course, a few topics and related assignments were introduced for the students. Although these students are not the ideal test group being Engineering students rather than Design students - the lessons and assignments were simplified for the purpose of the study. All game activities proposed as supplementary learning material were tested with 1st year B.Des students

SECONDARY RESEARCH

BOOKS/ PAPERS/ JOURNAL ARTICLES

Colour Studies: Clarification and Alpha-Numeric Adaptation of Notation Systems for Artists and Designers - Ebigbagha, Zifegha Sylvester[2]

This paper utilises a qualitative approach that employs the critical, historical, and analytic examination to provide clarification on the constructive and expressive aspects of colour studies. The paper introduces the reader to the pivotal role of colour and its multi-disciplinary interest. Also, it adequately clarifies paradigms and theories in the physical, psychophysical and psychological domains with particular emphasis on areas of practical value to art and design. Moreover, it considers the numeric adaptation of the colour wheel to a set of numbers for harmonic relationship. And it ends with the need for artists and designers to comprehensively grasp the contextual behaviour of colour and develop colour originality through creative construction and effective use in order to successfully express themselves in colour.

Elements of Colour: A cultural approach - Swasti Singh Ghai[3]

This article is the documentation of an Interactive Workshop held between March 27- 28 in 2015 at NID for the Design Foundation Programme for first year students. It revamps the basic design course in Colour with an attempt to bring to table - local and cultural theories along with the western theories of colour.

Composing with Visual Devices - Chakradhar Saswade[4]

The Foundation Programme at NID consists of various analogous courses that along other concerns, predominantly address aspects of visual form and visual language, because design activity primarily focuses on making and deciding upon forms as end products. This article documents a new course in Elements and Principles of Visual Composition which was essentially aimed to develop awareness and perception about structural unity as the order or cohesiveness of component parts in a form. The article includes examples of a series of simple exercises, which sensitise the students with the guiding principles of design aesthetics and basic visual elements as materials.

Interaction of Colour - Josef Albers[5]

Josef Albers's Interaction of Color is a masterwork in art education. It was conceived as a handbook and teaching aid for artists, instructors, and students; this influential book presents Albers's singular explanation of complex Colour Theory principles. Originally published by Yale University Press in 1963, Interaction of Color remains an essential resource on Color, as pioneering today as when Albers first created it. The book demonstrates principles such as colour relativity, intensity, and temperature; vibrating and vanishing boundaries; and the illusion of transparency and reversed grounds.

The Elements of Colour - Johannes Itten[6]

This book covers subjective feeling and objective colour principles in detail. It presents the key to understanding colour in Itten's colour circle and colour contrasts. It also includes Itten;s most famous contribution - 'The Seven Color Contrasts'. The Chapters contain theories on colour mixture, on ways in which hues can be arranged for harmonious order, simple relationships between colours and form, spatial effects. The book also presents notes on colour symbolism and composition.

Design and Form - Johannes Itten[7]

This book discusses the basis of Itten's theories of composition in combination with the general theory of contrast. The chiaroscuro (brightness-darkness) contrast, the material and texture studies, the theory of forms and colours, the rhythm and the expressive forms were discussed and demonstrated in terms of their contrast effect.

Bauhaus Archiv - Magdalena Droste[8]

This book presents documents, workshop products from all areas of design, studies sketches in the classroom, and architectural plans and models as part of its comprehensive inventory. This book includes studies from the work of Bauhaus' most important proponents, including Walter Gropius, Marcel Breuer, Vassily Kandinsky, Paul Klee, etc.

Theory of Colours - Johann Wolfgang Goethe[9]

The book reveals Goethe's views on the nature of colours and how these are perceived by humans. The book contains detailed descriptions of phenomena such as coloured shadows, refraction, and chromatic aberration.

The abc’s of the Bauhaus and Design Theory - Ellen Lupton and J. Abbott Miller[10]

The ABC's of the Bauhaus is a collection of visually and intellectually stimulating essays about basic design courses at the Bauhaus including the ones on Colour Theory and its application.

Colour at the Bauhaus - John Gage[11]

This journal article reflects on two of the most popular colour handbooks which are widely used in art schools to date - Johannes Itten's The Art of Color and Josef Albers Interaction of Colour[5] From the point of view of the history of the Bauhaus, too, the rather specific topic of colour allows us to examine its teachings at various moments of its life, and to go behind the differences of opinion and clashes of personality which have so often bedevilled the study of this recent and wide-ranging influence on art education in the twentieth century. Itten and Albers offer a good starting point, for they have often been contrasted as representatives respectively of the early, Romantic or Expressionist phase of the Bauhaus at Weimar, and the mature, Constructivist period at Dessau after 1925. The author suggests that this contrast has been overdrawn, and that, for all their differences of style and personality, both brought to the study of colour a very similar set of preoccupations, which they shared with many other artists inside and outside the Bauhaus itself.

The Interaction of Colour in the Context of Electronic Media - Thesis by Lindsay Brooke Beach[12]

This thesis research by Lindsay Brooke Beach is part of the Graduate program in Design at The Ohio State University. Written in 2012, it is constructed around leveraging applied, professional art practices coupled with emerging technologies to expand the educational experience in the Design classroom with a focus on Colour Theory. As part of the thesis, Lindsay developed a basic prototype that addressed the fundamentals of the in-class exercises in a digital interface.

COURSES AND LESSON PLANS

Art Institute of California[13]

School of Design, University of Illinois, Chicago[14]

UGC Curriculum[15]

MIT Open courseware[16]

DSource[17]

COLOUR THEORY: COURSE CONTENT

No	Topics Identified	Goals	Assignments/ Activities
1	Colour Physics	Students should be able to understand why we see colour as it exists, what is the visible spectrum and how human eye sees and perceives colour	-Prism experiment -Colour blindness test
2	-Hue & Value -Tints & Tones -Shades & Saturation	Students should develop an understanding of colour terminologies of hue, value, tint, tone, shade, saturation. Students should also develop a sensitivity to lightness and darkness of colours	-Grey scale -Tint scale, tone scale, shade scale with any 1 colour -Arrange various hues (colours) against matching grey values -Puzzle games: arranging colours in order of hue+value
3	-Colour Models: Additive/ Light & Subtractive/ Pigment -CMYK printing -RGB values on digital tools	Students should be able to differentiate between pigment colours and light based colours. Students should be able to understand how CMYK colours are mixed for printing and how RGB colours are used for colour values in web based applications	-Mixing primary pigments to get black, explore other combinations -Mixing primary lights to get white light, explore other combinations -Visit to a CMYK printing workshop
4	-Colour Wheel: Primary, Secondary, Tertiary	Students should be able to recall what are primary, secondary colours and why are they named thus	-Arranging colour swatches into compositions for harmony, contrast, warm, cool, etc -Colour wheel from mixing primary colours
5	Colour Schemes - Monochromatic, Analogous,	Students should develop an understanding of how colour schemes can help us create good	-Create colour harmony (through schemes) in a colour composition

	Complementary, Split Complementary, Triadic, Square/ Quadratic -Colour Temperature	palettes for compositions and be able to differentiate between warm and cool colours	
6	-Itten's 7 Contrasts -Colour Interaction, Visual Mixing -Bezold Effect	Students must be able to come up with different ways of achieving contrast which is important for establishing harmony in compositions, distinguishing elements, etc	-Explore all 7 contrasts through compositions -Find relevant examples of these contrasts in famous art
7	Colour Psychology	Students should develop a basic understanding of how colours affect people physically and psychologically	
8	Optical Illusion	Students must be able to use the learnings to understand the reason behind optical illusions that use colour as the main element	-Identify what principles are coming into play -Create your own optical illusion

PRIMARY RESEARCH

Semi-structured qualitative interviews (14 in total)

1. Faculties and professors teaching Colour Theory at different design schools in India - (5)
2. Students currently enrolled in design schools who have completed Colour course - (4)
3. Professionals practising design in the industry - (5)

Prompts/ Areas for discussion - Faculty Interviews

→ Right balance between theory and practise for courses like Colour Theory

→ Pedagogy methods

→ Importance of Foundation courses (specially colour theory)

→ What were the main teaching/learning points when you taught the course

→ How is the course structured now?

→ Difference across institutes/ across faculties - is there a basic structure?

→ How important is individuality of faculties over a common course structure for foundation basics

→ Different perception of design education in different institutes

→ Important topics for colour course

→ What are the unmissable core topics that need to be taught, what can be self taught?

→ Bauhaus, postmodernism - drives design in India.. Do we need a local/cultural approach?

→ Activity/ assignment based learning

→ New tech, digital adaptation for core courses

Prompts/ Areas for discussion - Student Interviews

→ Brief walkthrough of colour course or any colour based module they had

→ What were the assignments, activities like

→ Learnings and takeaway from the course

→ Have they applied these learnings in other modules? How?

→ How was the course taught? What mediums were used

- → How was the evaluation done
- → Did they encounter any problems during the course
- → What were the most important takeaways

Prompts/ Areas for discussion - Industry Professional Interviews

- → What is your design process like? How do you go about selection of colour
- → Do they recall colour course or any colour based module they had during their education
- → Learnings and takeaway from the course that have stayed till now
- → Have they applied these learnings in their work? How so
- → What references, tools, mediums do they use for colour usage in their designs

ANALYSIS

1. Fixed structure can be limiting

Primary Research

Design education follows a flexible structure because a lot of the learning is tacit in nature; introducing a fixed curriculum may limit the instructors to only teach from within the defined area

2. Intensity of the course is uneven across years

Primary Research

Experienced faculty members felt that the intensity of the same module keeps changing with different instructors, and all batches do not get the same benefits or outcome from the course
Such is also the case across different design schools offering the same course. While younger faculties had structured the course similar to how they had learnt it as a student - and while they had new topics they wished to include, they had not done so yet

3. Assignments are mainly practice oriented

Primary Research

A major challenge in teaching foundation basics to young design students is that design sensitivity is built over time, through experience. The application of these learnings only comes through practice.

Most of the designers in the industry do not recall the theories or terminologies they had learnt during their foundation course in design schools, but rather the applications of such theories.

Secondary Research

“ It should be learned that one and the same colour evokes innumerable readings. Instead of mechanically applying or merely implying laws and rules of colour harmony, distinct colour effects are produced - through recognition of the interaction of colour. The aim of such study is to develop - through experience - by trial and error - an eye for colour. As a general training it means development of observation and articulation.”
- Interaction of Colour, Josef Albers[5]

4. Colour Psychology is not well addressed in the curriculum despite being one of the most important topics

Primary Research

Almost always, the colour decisions are based on denotations from the brief - what the final product is supposed to feel like/represent. Emotional & physiological significance is prioritised.

Secondary Research

Although there are some universally accepted associations for colour, it is still not scientifically proven that all individuals may see and perceive colour in the same manner. It is subjective to each

individual, it may vary due to life experiences, traditions, culture, region, politics, etc

Observations

A lot of work was done on colour psychology in the 1900s by prominent professors like Kadinsky, Itten, Paul Klee but due to lack of scientific evidence and proper research, it has not continued to be a part of curriculum in most schools.

5. There is a need for moving on to digital formats over paper and paint based practices to teach Colour Theory

Primary Research

Experienced professors argue that teaching the basics of design requires isolating the focus on the content and if digital tools are introduced, a student may focus more on the technical aspect or the functionality of the tool.

Younger faculties did mention that although they wished to introduce digital alternatives to the course assignments, they were sceptical about it.

Students mentioned that while some faculty did try to include exercises that made use of digital media, it was not entirely successful since the method involved a combination of physical medium, digital medium and printed materials - where colours react differently in each medium.

Secondary Research

Physical materials like colored paper and paint are used to teach the same lessons that were constructed by Josef Albers and Johannes Itten at the Bauhaus School of Design in Germany in the 1920s. A century later, concepts such as colour contrast and the illusion of transparency are still standard in today's design courses, and are still being taught using the same materials despite the fact that the industry and technology used by designers has changed considerably.

Observations

Although a hands-on approach may be engaging, we can avoid unnecessary mixing of paints, and repeated cutting of papers. Also, by not exposing the student to discouraging failures of mixing and imperfect matching of spoiled paints and papers we not only save time, material and can be assured of accessibility to the exact same colours and activities for all. Digital colours permit a repeated use of precisely the same colour across platforms (except slight changes due to colour calibrations). It permits repetition without disturbing changes caused by varying application of paint (thinner or thicker-even or uneven); without traces of hand or tool resulting in varying density and intensity, or without problems of shortage of the same pigments or paper.

Nowadays most students have access to laptops or computer systems since they are a requisite for study in design schools. Using open, free digital tools eliminates equipment for handling

paper or paints, and therefore is easier, cheaper, and more accessible. Current design curriculum teaches the concepts surrounding colour in a physical arena. The mixing and interaction of paint and pigment differs greatly from that of the mixing and interaction of light or additive colour. The education of key colour concepts such as contrast and colour interaction, are arguably different in subtractive and additive colour models.

When compared to paints or paper, creating a colour swatch digitally has a significant difference in time taken. This will promote faster completion of tasks, more explorations, and can accommodate extra activities in the given duration of the course. Emerging technology can not only expand on the ability to teach the subject of colour efficiently but also effectively and in line with today's trend of digital output. Students could quickly learn about the interaction of colour, and experience the concepts of traditional colour theory curriculum in digital format they are familiar with.

RESTRUCTURED BRIEF

The focus of the project will be to enhance the educational experience by combining traditional design education practices with emerging technologies. The aim is to develop a method for teaching Colour Theory that extends the classic theories rooted from the Bauhaus School, into a digital and interactive space.

COURSE MATERIAL

Colour tasks can be classified according to how the colour is interpreted. Cole Barry[18] describes four categories of colour tasks:

1. Denotative – When identifying colours, for example by name, such as “where is the yellow ball?”

2. Comparative – When multiple colours must be compared, such as with mixing paint

3. Aesthetic – When colours look nice – or convey an emotional response – but don’t carry explicit meaning

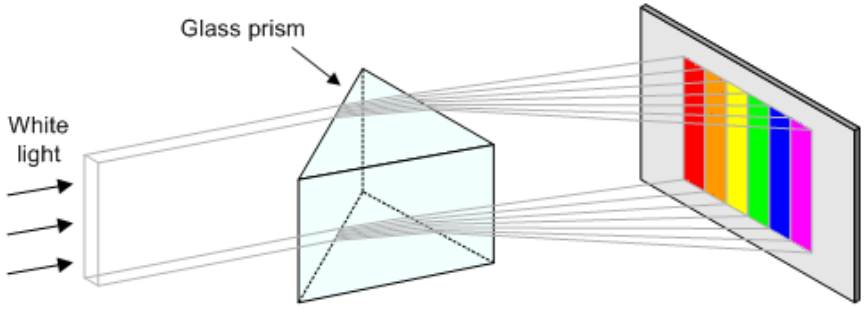
4. Connotative – When colours are given an implicit meaning, such as red = stop

The course is divided into 4 Lessons based on these categories.

Lesson 1: Introduction to Colour[20]

(Denotative)

Colour Physics: In 1676, Sir Isaac Newton, using a triangular prism, analysed white sunlight into a spectrum of colours. Such a spectrum contains all hues except purple. Newton performed his experiment as follows

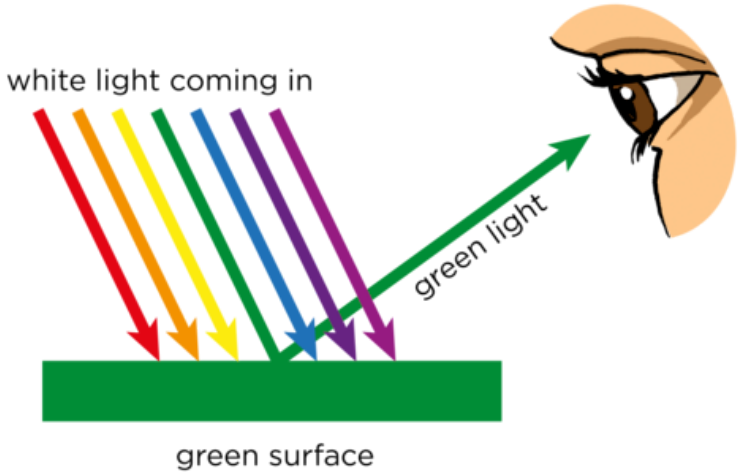


(Fig. 1): Sunlight entering through a slit falls upon the prism

In the prism, the ray of white light is dispersed into the spectral colours. The dispersed ray of light can be projected on a screen to display the spectrum. A continuous band of colour ranges from red through orange, yellow, green, blue, to violet. If this image is collected by means of a converging lens, addition of the colours will yield white light once again.
These colours are produced by refraction. There are other physical ways of generating colours, such as interference, diffraction, polarisation, and fluorescence.

When light hits an object, the object reflects some of that light and absorbs the rest of it. Some objects reflect more of a certain

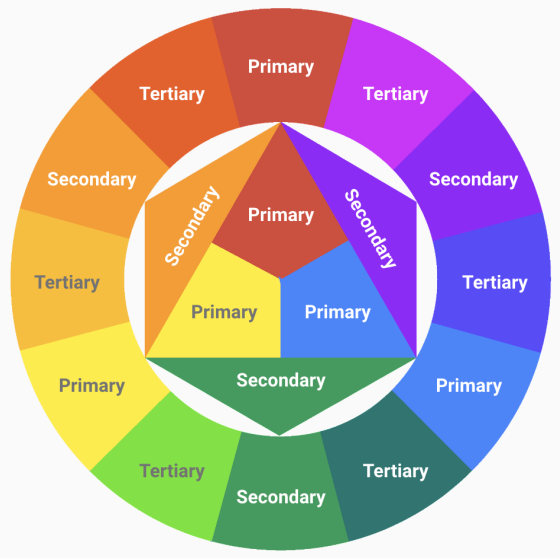
wavelength of light than others. That's why you see a certain colour. For example, a lemon reflects mainly yellow light.



(Fig. 2): A coloured surface reflects the corresponding coloured light and absorbs the rest

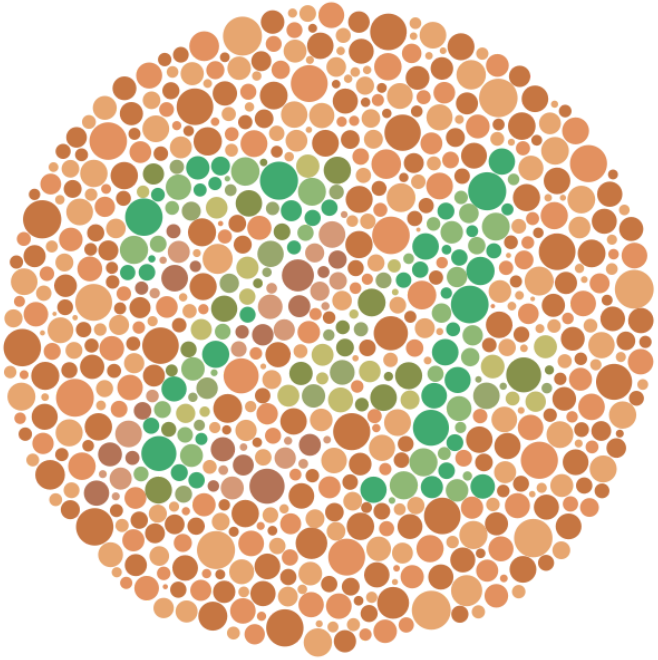
Objects that absorb all wavelengths of light appear black. Objects that reflect all wavelengths of light appear white. There are three types of cones in a human eye which helps us identify colours: red, green and blue. Each type responds to different wavelengths of light. Long wavelengths stimulate red cones. Short wavelengths stimulate blue cones. Medium wavelengths stimulate green cones. When different combinations of cones are activated, you see the world in colour.

Colour Wheel: A person with normal vision can identify a red that is neither bluish, nor yellowish; a yellow that is neither greenish, nor reddish; and a blue that is neither greenish, nor reddish. These form the Primary Colours. Secondary colours are made up of a mixture of adjacent Primary Colours.
Yellow + Red = Orange, Yellow + Blue = Green, Red + Blue = Violet
Tertiary Colours are made up of a mixture of adjacent Secondary Colours. A colour can be "Blue-Green", "Yellow-Red", "Yellow-Green", etc - but never "Yellow-Blue" or "Red-Green"
Yellow + Orange = Yellow-Orange, Red + Orange = Red-Orange
Red + Violet = Red-Violet, Blue + Violet = Blue-Violet
Blue + Green = Blue-Green, Yellow + Green = Yellow-Green

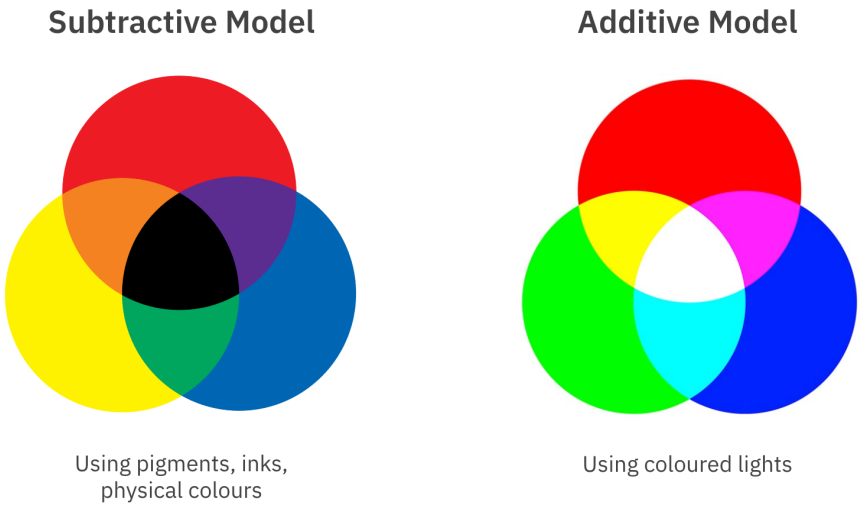


(Fig. 3): Artist's Colour Wheel

The Human Eye: There are three types of cones in a normal human eye which helps us identify colours:
Red, Green and Blue
Each type responds to different wavelengths of light. Long wavelengths stimulate red cones. Short wavelengths stimulate blue cones. Medium wavelengths stimulate green cones. When different combinations of cones are activated, you see the world in colour.



(Fig. 4): Ishihara Colour Blindness Test Image



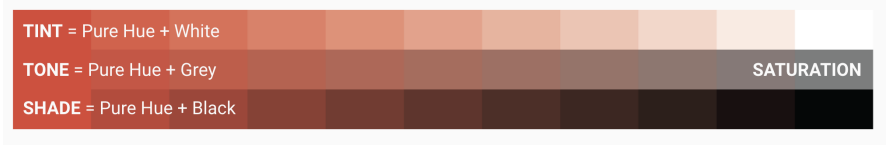
(Fig. 5): Subtractive Model vs Additive Model

Colour Mixing: Subtractive colour mixing is what happens when you mix paint pigments together. Every addition of a new colour darkens your result. In subtractive mixing, each addition of a new colour brings the result closer to black. The combination of all colours is black and the absence of colour is white.
Additive colour mixing, such as light, has different primaries. We deal with red, green and blue. If you keep in mind that every addition of a light source makes the result brighter, it's easier to grasp that as you add colours in additive mixing, you get closer to white. White light is the combination of all colours and black is the absence of light.[19]

Hue: Hue is 100% pure colour. Hue is what most people think of when using the term ‘colour.’ Examples of hues are: red, orange, yellow, green, blue, violet.

(Fig. 6): Hues are pure colours

Value and Saturation: Value refers to the lightness or darkness of a colour. Tint is a mixture of a colour with white, which increases lightness, while a Shade is a mixture with black, which increases darkness. A Tone is produced either by mixing a colour with grey, which is also known as that colour’s relative Saturation.



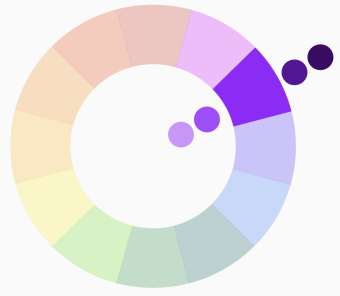
(Fig. 7): Tint, Tone and Shade of Red Hue

Lesson 2: Colour Schemes[21]

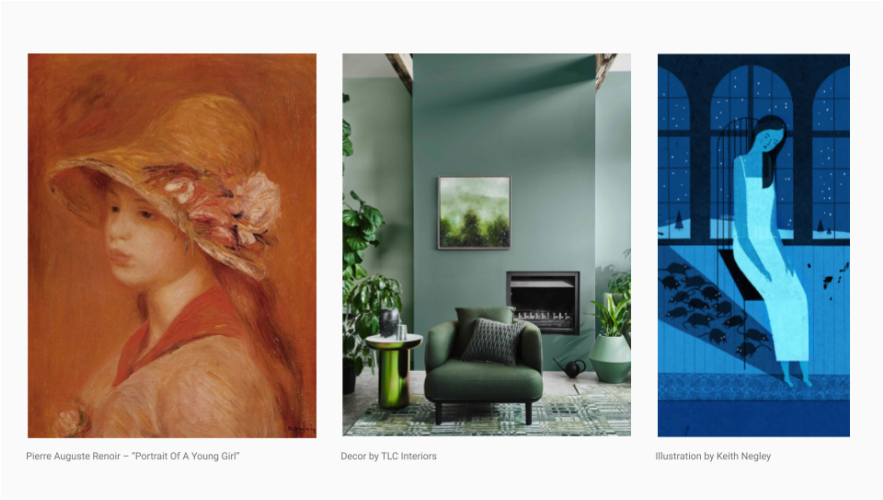
(Comparative)

Why must we study Colour Schemes: A colour scheme consists of a combination of colours consisting of one or more of the twelve colours present on the colour wheel. By using colour schemes you can easily create palettes to use in any design. Different colour combinations evoke different meanings

Monochromatic Colour Scheme: Uses only one colour - combination of Tints, Tones and Shades of a colour. This scheme is used to produce a consistent look and feel - clean and subtle.

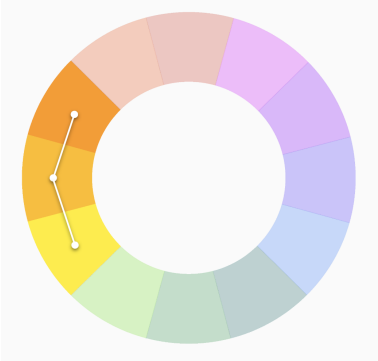


(Fig. 8): Monochromatic Colour Scheme

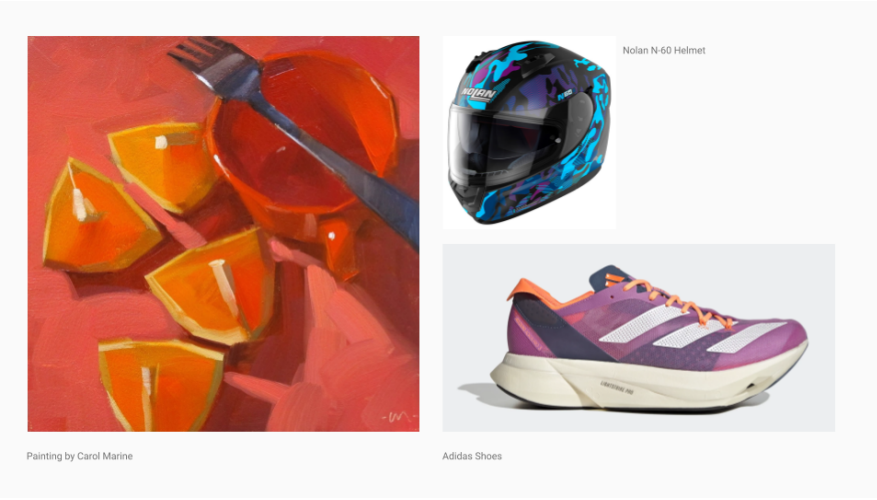


(Fig. 9): Examples of Analogous Colour Scheme

Analogous Colour Scheme: Uses three colours next to each other on the colour wheel and relevant tints/shades of those colours. This scheme has a very harmonious appeal.



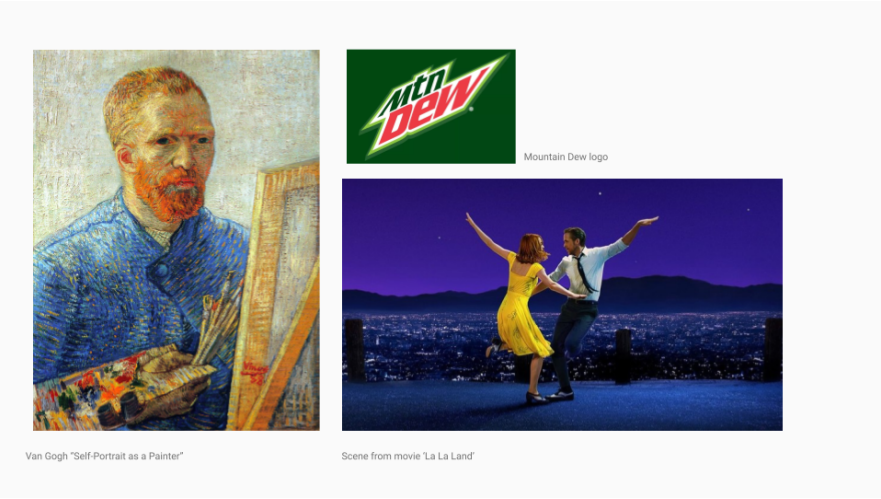
(Fig. 10): Analogous Colour Scheme



(Fig. 11): Examples of Analogous Colour Scheme

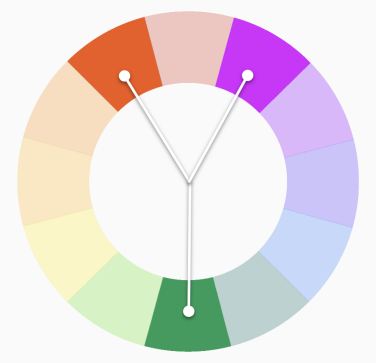
Complementary Colour Scheme: Uses two colours directly across from each other on the colour wheel and relevant tints/shades of those colours. This scheme is used to create high contrast

(Fig. 12): Complementary Colour Scheme



(Fig. 13): Examples of Complementary Colour Scheme

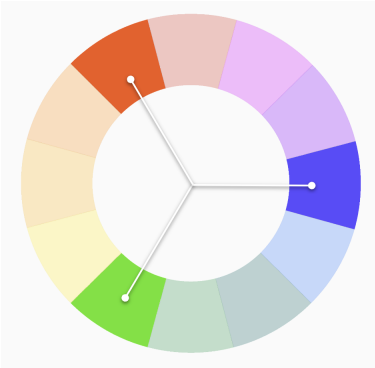
Split Complementary Colour Scheme: Uses three colours with a base hue and two adjacent colours to the colour which is directly across from the base hue. The split-complementary colour scheme has the same sharp visual contrast as the complementary colour scheme but has less pressure.



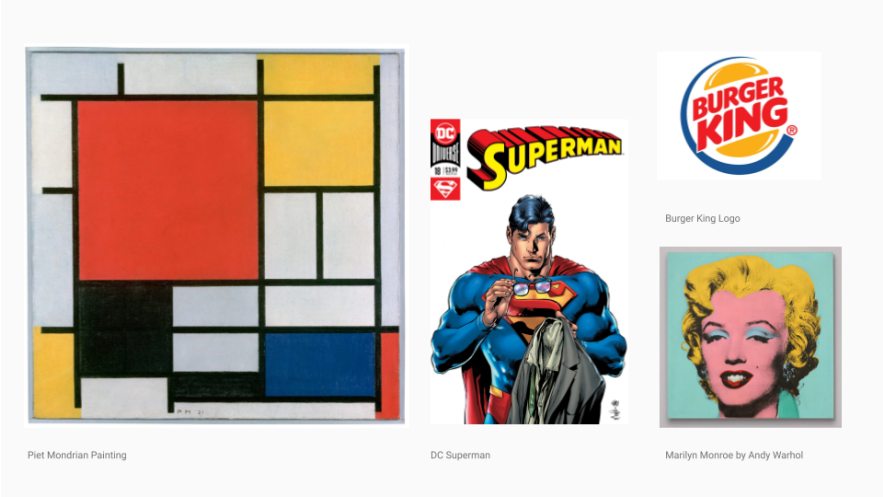
(Fig. 14): Split Complementary Colour Scheme

(Fig. 15): Examples of Split Complementary Colour Scheme

Triadic Colour Scheme: A triad consists of three colours that are placed equidistant from each other on the colour wheel. Triadic colour schemes can include three primary, secondary, or tertiary colours. It provides sharp visual contrast while maintaining balance, and colour richness.

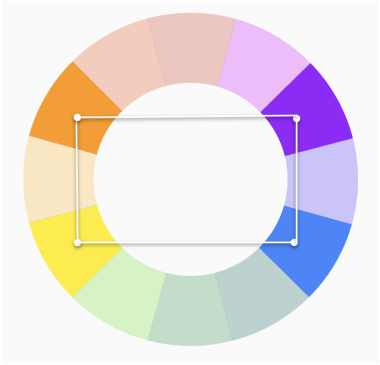


(Fig. 16): Triadic Colour Scheme

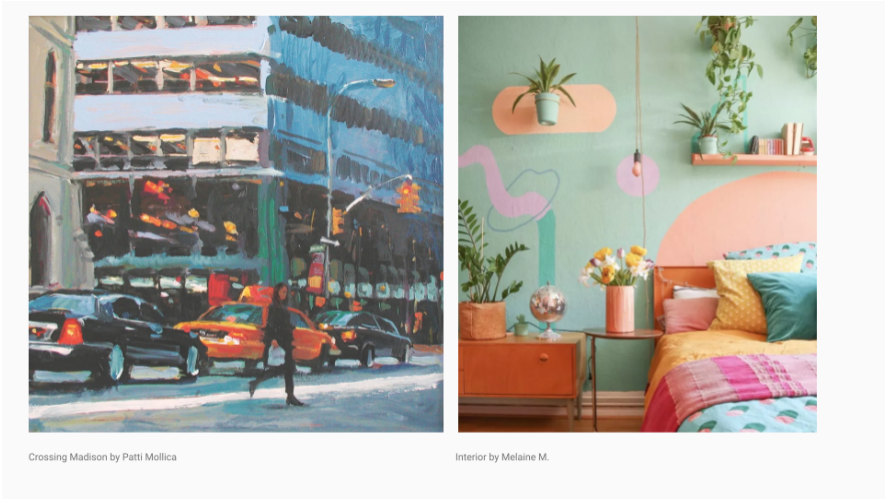


(Fig. 17): Examples of Triadic Colour Scheme

Tetradic Colour Scheme: It uses four colours arranged into two complementary colour pairs forming a rectangle. This scheme is very rich but hard to harmonise and requires a colour to dominate or subdue the colours; if all four colours are used in equal amounts, the colour scheme may look unbalanced.

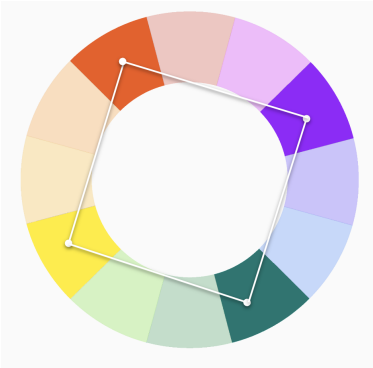


(Fig. 18): Tetradic Colour Scheme

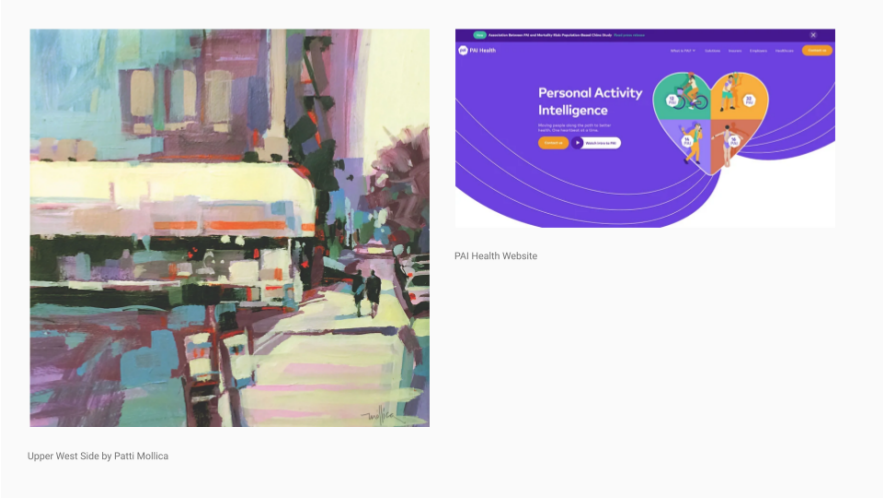


(Fig. 19): Examples of Tetradic Colour Scheme

Square Colour Scheme: The square colour scheme uses four colours equidistant from each other on the colour wheel to create a square or diamond shape. It is more harmonious than tetradic schemes but offers similar richness to the palette.



(Fig. 20): Square Colour Scheme



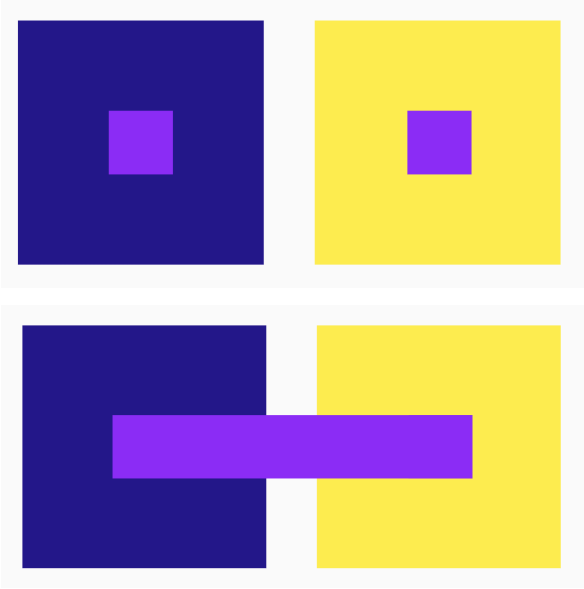
(Fig. 21): Examples of Square Colour Scheme

Warm and Cool colours: Compare “yellow” to “blue” and it’s easy to see yellow is warm and blue is cool. Comparing “red” to “magenta” might be less obvious since they are next to each other. The easiest way to do this is to look at the colour it leans towards on the primary or secondary wheel. If it’s closer to red or yellow, it’s a warm colour; and if it’s closer to blue or green - it’s a cool colour. In most cases, warm colours advance, while cool colours recede. This is because our eyes adjust when focusing on colours of different wavelengths. For example, red light waves have a longer wavelength than blue ones. This affects how our eyes perceive depth, even in 2-dimensional applications like painting or web design.

(Fig. 22): Warm and Cool colours

Lesson 3: Interaction of Colour[22] (Aesthetic)

Why must we study colour interaction: Every colour is seen in relation to another colour. When you see two or more colours together they have a profound effect on one another. The study of colour interaction helps us understand and predict how a colour will be influenced by its surroundings



(Fig. 23): Same shade of violet appears different on different backgrounds

Itten's Contrasts

Contrast of Hue: Contrast is created by the use of different hues. The intensity of the contrast reduces as the hues move further away from the primary colours

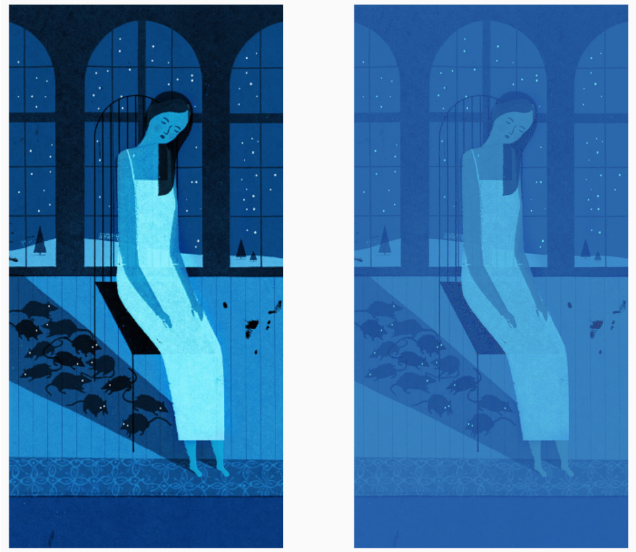
(Fig. 24): Change in contrast with Primary and Secondary colours

(Fig. 25): Secondary colours reduce the contrast

Contrast of value/ saturation: Contrast is created by the use of different values. It could either be of the same colour or different

colours. A pure colour may be diluted with:

White - rendering it’s characteristics somewhat colder
Black - depriving colours of their quality of light
Gray - resulting in a less intense colour



(Fig. 26): Reducing value difference leads to less contrast

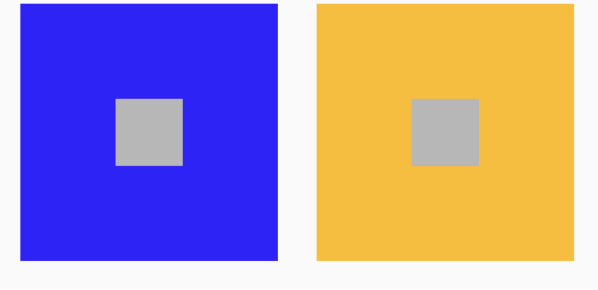
Contrast of warm and cool: Warm colours such as red, orange, yellow, and browns evoke a feeling of warmth and comfort, and are attractive to the viewer. As a result, objects painted this colour appear to move forward. Cool colours, such as blue, green and greys, recede into the background. The contrast of warm and cool can be used to create nearness and distance.

(Fig. 27): Contrast between warm and cool colours

Complementary Contrast: A Complementary contrast exists when two complementary colours are placed side-by-side. Used in the right proportions complementary colours give the effect of a statically fixed image. Each colour stands unmodified by its intensity stabilising effect

(Fig. 28): Complementary colours have a stabilising effect

Simultaneous contrast: Although the two grey squares are the same - along with appearing different in value - light or dark, the square inside the Blue will look like an orange-grey while the one inside orange looks bluish (opposites to each other on colour wheel)



(Fig. 29): Neutral greys appear to be tinted with a complementary tone to the background colour

Contrast of Proportion: is based on the relative areas of two or more areas of colour, such as large and small. If a small bright spot contrasts with a large area of darkness the picture receives an increased significance

(Fig. 30): Use of small area of contrasting colour draws focus

Goethe's light values: We find that the intensities or light values of the several hues are different. Goethe set up simple numerical ratios for these values. They are approximate - ultimately, vision must decide. In converting these values to harmonious areas, we must take the reciprocals of the light values; that is, yellow, being three times as strong, must occupy only one-third as much area as its complementary violet.

Goethe's light values are as follows:
Yellow : Orange : Red : Violet : Blue : Green = 9:8:6:3:4:6

Harmonious proportions for complementary pairs:

Yellow: Violet = 1/9:1/3 = 1:3

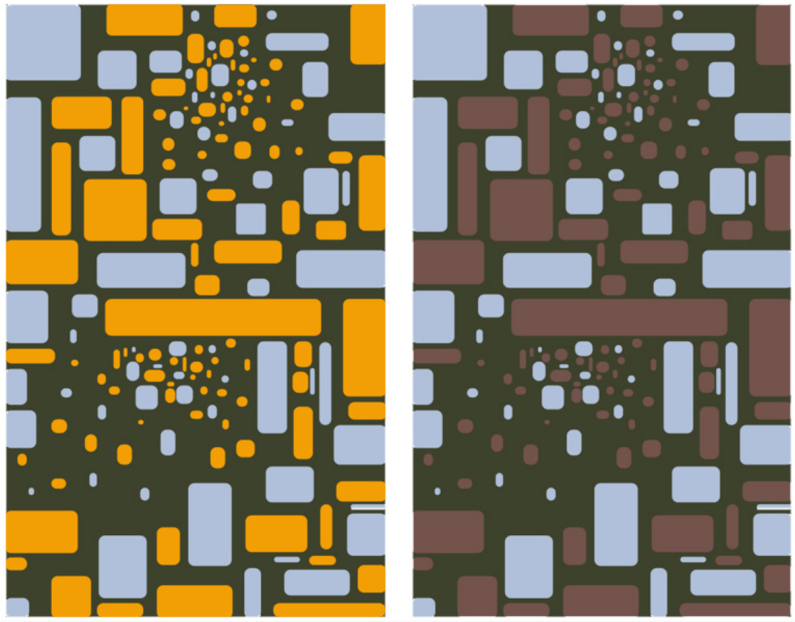
Orange: Blue = 1/8:1/4 = 1:2

Red: Green = 1/6:1/6 = 1:1

(Fig. 31): Goethe's harmonious proportions for Primary & Secondary colours

(Fig. 32): Not using colours in harmonious proportions can make the composition unbalanced

Bezold Effect: There is a special kind of optical mixture, the Bezold Effect, named after its discoverer, Wilhelm von Bezold (1837–1907). He recognized this effect when searching for a method through which he could change the colour combinations of his rug designs entirely by adding or changing 1 colour only.



(Fig. 33): Changing only 1 colour can completely change the composition

Lesson 4: Colour Psychology

A lot of work was done on colour psychology in the 1900s by prominent professors like Kandinsky, Itten, Paul Klee but due to lack of scientific evidence and proper research, it has not continued to be a part of curriculum in most schools. It is subjective to each individual, it may vary due to life experiences, traditions, culture, region, politics, etc
Lesson plan, assignments and evaluation need to be designed with a lot of thought and care. Further work is required in this area.

STRATEGIES USED IN DESIGNING LESSON CONTENT

1. Identifying goals and objectives of the lessons/ exercises done previously as part of Colour Theory course

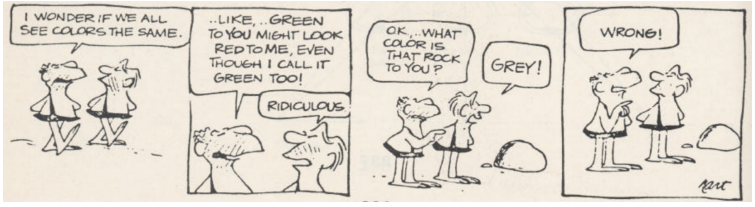
2. Careful selection of topics which have relevant application of Colour Theory in the current industry

3. Manipulation of resources and approaches to design learning content

4. Examples from not just famous artworks but of various designs spanning across different disciplines

5. Use and references of comics, pop culture references which will pique the interest of young students

6. Reusing same examples in different contexts by juxtaposing them to explain theoretical concepts



(Fig. 34): Comic by Johnny Hart

(Fig. 35): Examples from design across disciplines

(Fig. 36): Pop culture reference: DC Superman

(Fig. 37): Repeated use of same example in different contexts

ASSIGNMENTS/ ACTIVITIES

Assignment 1: Introduction to Colour[24]

Exploring colour mixing through Photography

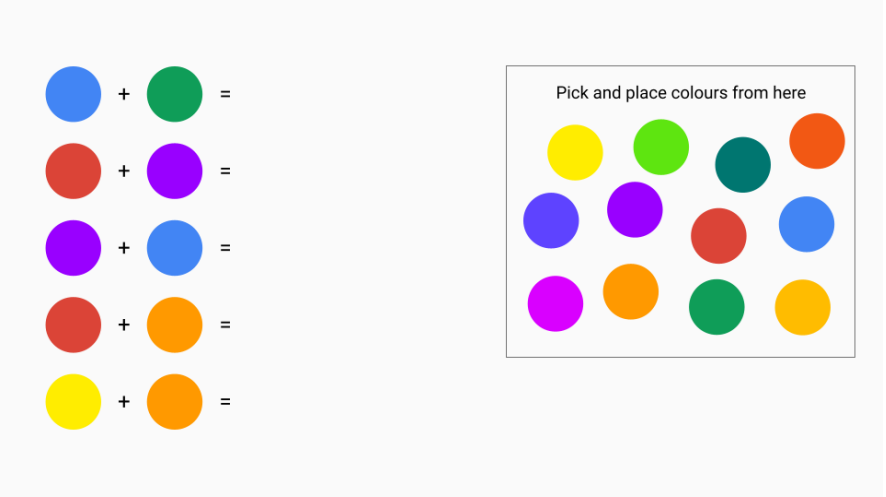
Brief: Capture multiple photos where you are modulating light or playing with translucent coloured objects to create interesting mixtures. You could make use of coloured glass/ sheets, CDs, reflecting objects, mirrors, coloured lights, etc for the assignment Select at least 3-4 unique photos for submission.

(Fig. 38): References given to students for Assignment 1

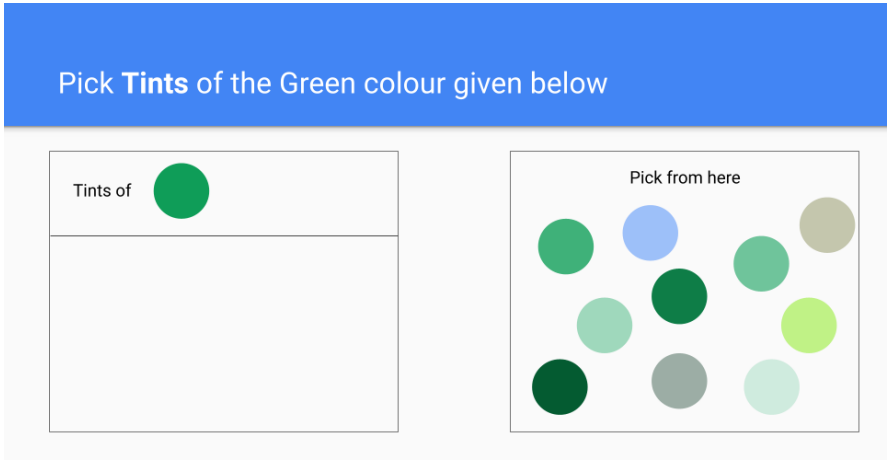
Assignment 2: Introduction to Colour[25]

Assignments based on learnings from Lesson 1 - Primary, Secondary, Tertiary colours; hue, value, tint, tone and shade

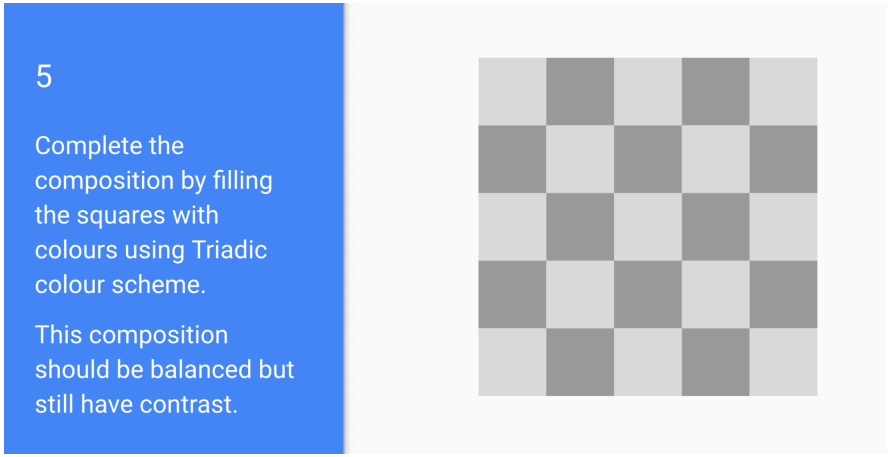
Brief: Pick appropriate colours from the selection to match the questions on each slide



(Fig. 39): A slide from Assignment 2



(Fig. 40): A slide from Assignment 2



(Fig. 41): A slide from Assignment 3

Assignment 3: Colour Schemes[26]

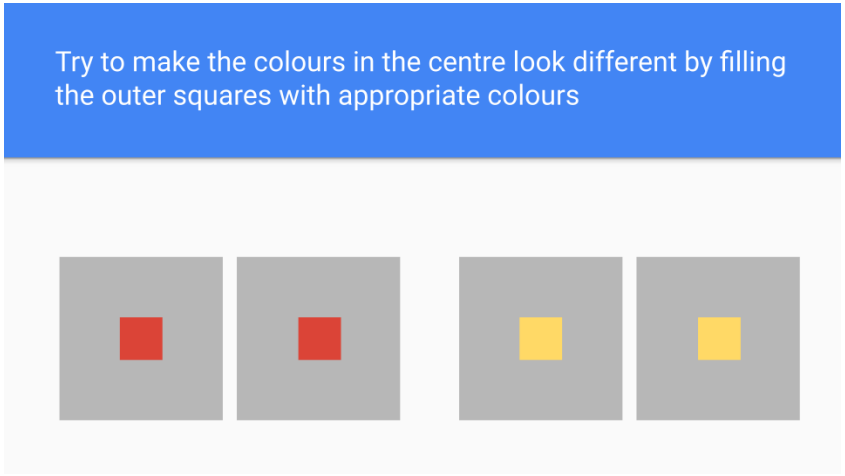
Assignments based on learnings from Lesson 2 about identifying and using various colour schemes

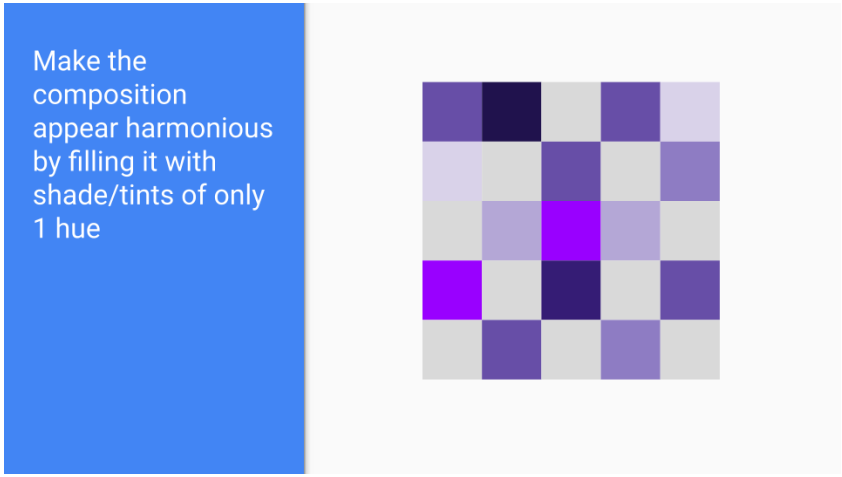
Brief: Fill in the grid composition with a particular colour scheme

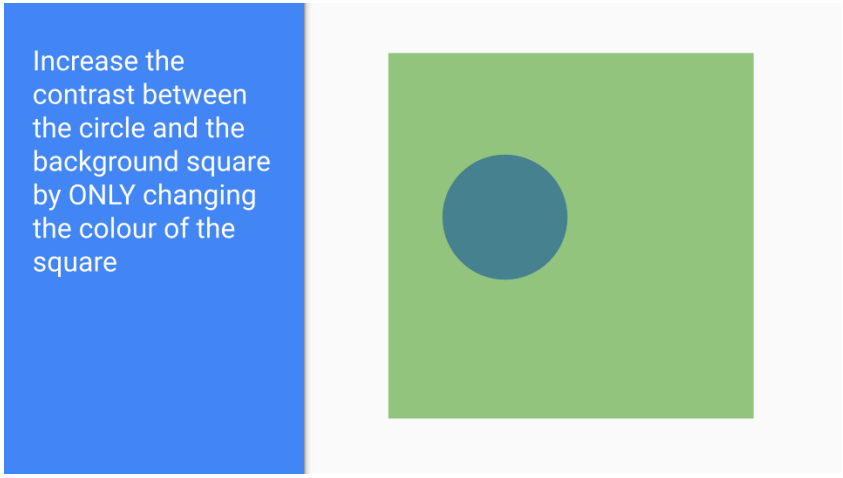
Assignment 4: Colour Interaction[27]

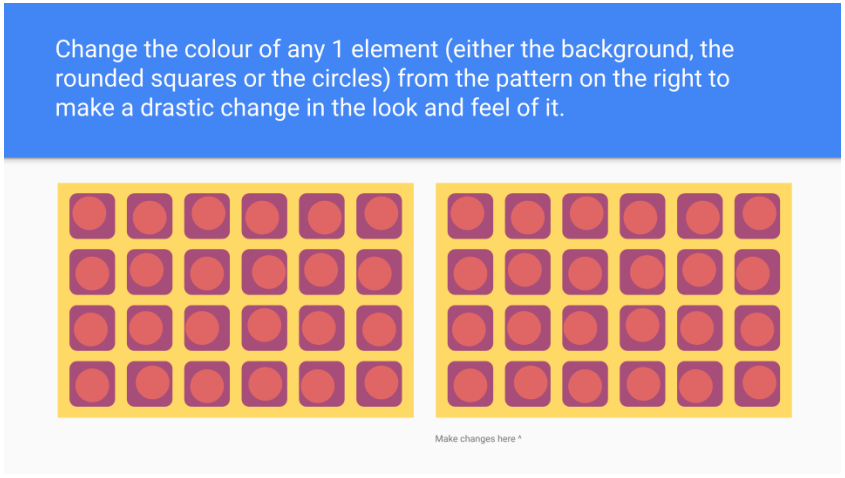
Assignments based on learnings from Lesson 3 about colour interaction and its application

Brief: Fill/change colours to make the colours appear different/ increase contrast/ introduce harmony/ etc









(Fig. 42): Slides from Assignment 4

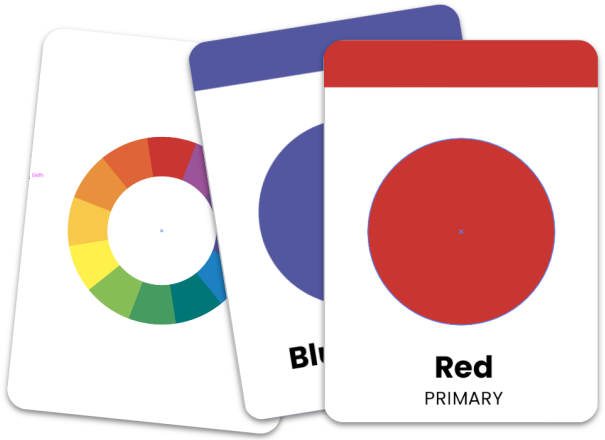
GAME ACTIVITIES

Activity 1: CUNO - A card based game

This game is based on the popular card game ‘UNO’

How to play: Each player is given 8 cards to begin with. A card is drawn from the common stash and placed in the centre facing up. The first player has to choose colour cards from his deck that form a colour scheme along with the card placed in centre. For a basic scheme like Complementary Colour Scheme which is made up of 2 colours - a player will only be able to put down 1 card. But for more complex schemes like Tetradic Scheme - the number will be 3. Once the first player puts down his cards while announcing the colour scheme, the next player has to take the top most card from the cards that have been put down - as the reference card to form his combinations from. If a player is unable to form any colour scheme, they must draw a card from the pile at their turn. First player to get rid of all their cards wins the game!

Modifications made to initial prototype: Since the game is played in a circle, players were unable to read colour details from the opposite side. Also the colour bar was only on one side, which would get overlapped and hidden, hence the new design had a mirrored design visible from both sides. Most people were also not very familiar with the more complicated colour schemes. Hence reference cards with the schemes highlighted were created to be kept in the centre for reference.



(Fig. 43): Initial prototype used for testing out idea

(Fig. 44): Final card deck design for the game

Activity 2: Change 2

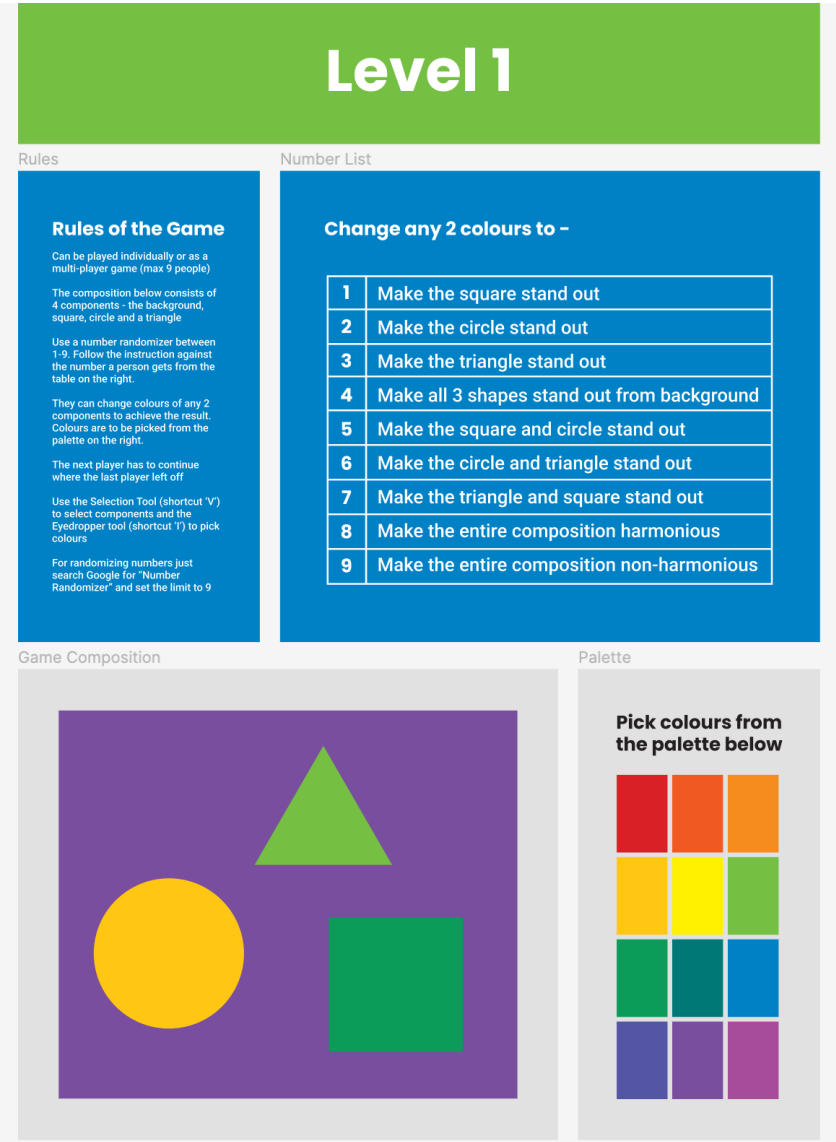
This game is based on the application of colour theories to achieve certain results like contrast, harmony and balance in a composition

Change 2: The Colour Game

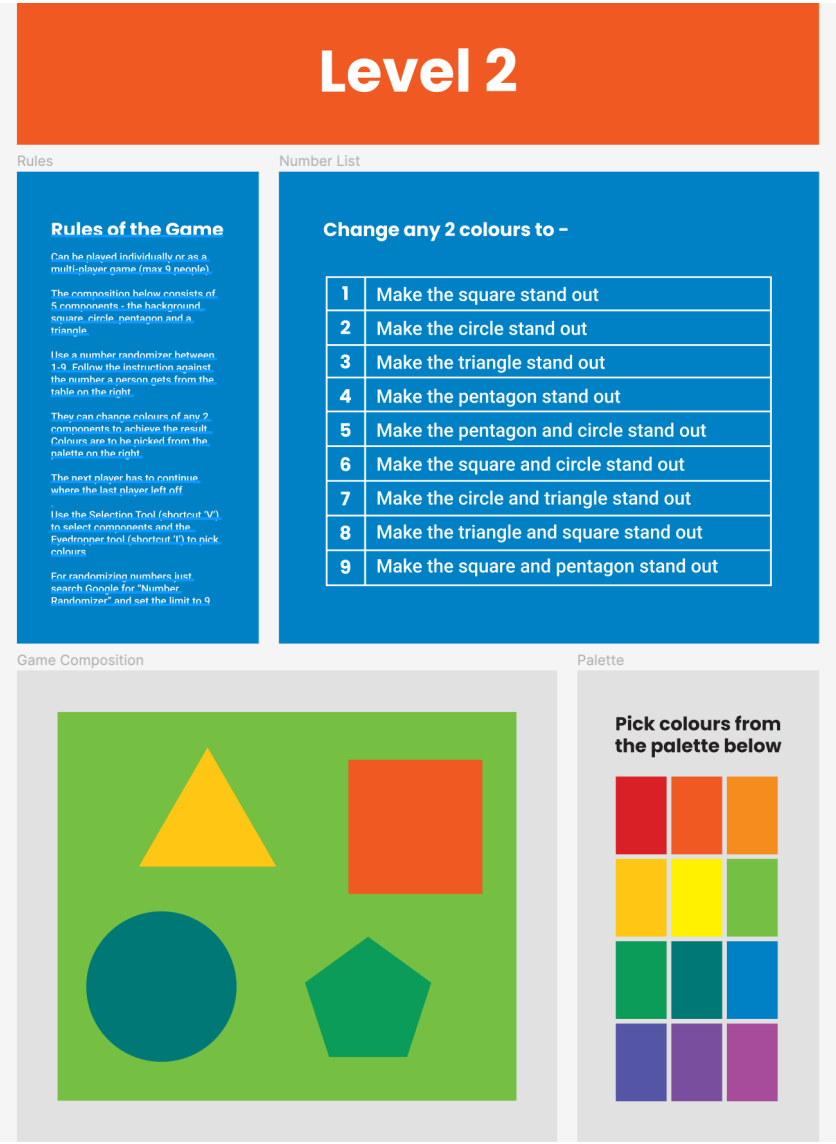
How to play: A basic composition of 4 components - a background, square, circle and a triangle - is part of the game. Players must use an online number randomizer between 1-9. A table with specific instructions for each number is provided. The players have to take turns and follow the instructions.

To achieve the result given in the instructions, a player can only change colours of any 2 components. The colours for the same are to be picked from the palette provided on the board.
The next player has to continue where the last player left off

This game was designed and set up on Figma - which is a free design tool. It will allow users to freely interact with the game board and make changes. Being online, people can also play this game remotely.
They have to use the Selection Tool (shortcut ‘V’) to select components and the Eyedropper tool (shortcut ‘I’) to pick colours from the palette



(Fig. 45): Game deck for ‘Change 2’ set up in Figma



(Fig. 46): Level 2 of 'Change 2'

(Fig. 47): Initial game deck used for testing out idea

STRATEGIES USED IN DESIGNING ASSIGNMENTS/ ACTIVITIES

1. Discarding traditional paper & paint based assignments to overcome challenges like - varying application of paint, change in colour after drying, difference in mixing in different mediums/ brands, mixing equal amount of paint in subsequent steps does not result in equal gradation

2. There is a gap between how Colour theory is taught and its application for actual design projects. With the advancement of technology, there is shift to digital mediums for not just the output but the ideation and design process as well - hence making the switch to digital interactive spaces for learning is essential

3. Isolating the focus on the objective/learning instead of the digital tools. Using the digital spaces for easy accessibility rather than use of features and tools.

4. Activities were designed to effectively reduce the time spent in arriving at the outcome. Unnecessary methodologies were eliminated so that the assignments can be done in a fraction of the time taken for traditional exercises. That time can be utilised for other activities or courses

EVALUATION

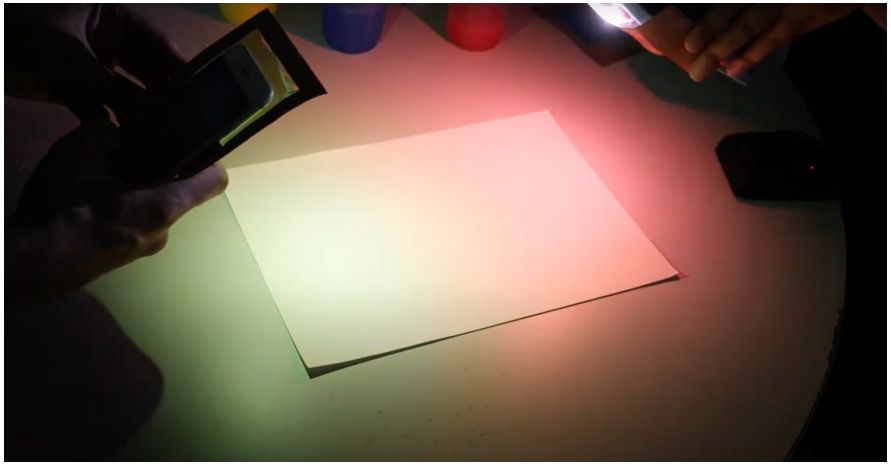
Lessons: For the evaluation of the lessons and assignments, parts of the course content is being tested with the HASMED[1] students as part of my Teaching Assistant duties. The scope of the project was for foundation year design students currently enrolled in Bachelors or Masters of design programs, who have an affinity towards design subjects. The project is also designed to be taught as a module rather than weekly hour-long classes which is currently the structure for the HASMED[1] course. Another challenge was that the class comprises roughly 180 students while the lessons are planned for a 15-20 students classroom environment which enables conversations between the instructor and the students.

Thus, for the purpose of the evaluation and due to the various constraints - the lessons and assignments had to be simplified.

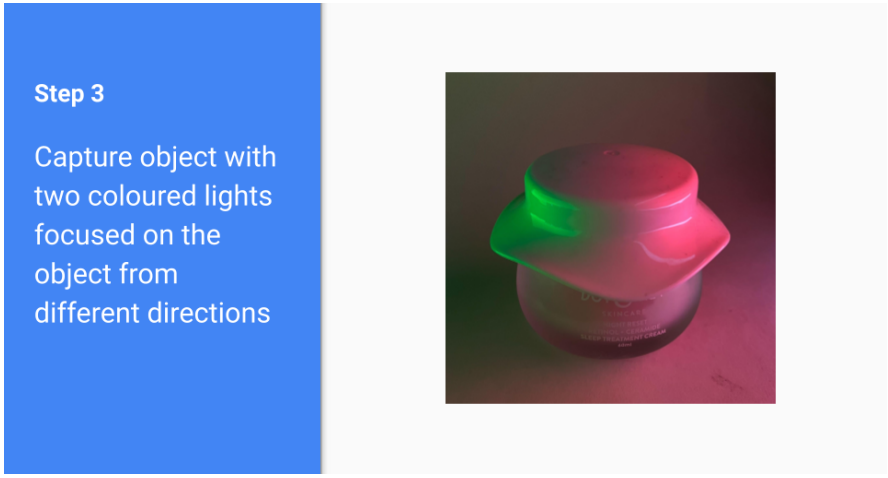
For Lesson 1: Introduction to Colour - a short video was filmed that could give the students an introduction to the physics of colour and colour mixing. The related Assignment 1 from the lesson was also modified into a step by step process for the students.

The presentation given in class to the students included a video and the explanation of the assignment - **Hasmed Assignment**[28]

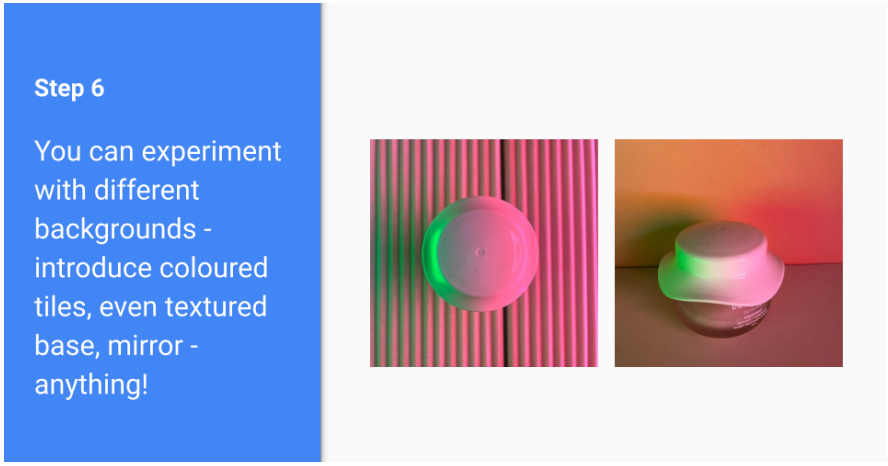
(Fig. 48): Screen grab from the video while explaining colour mixing



(Fig. 49): Screen grab from the video while explaining light mixing



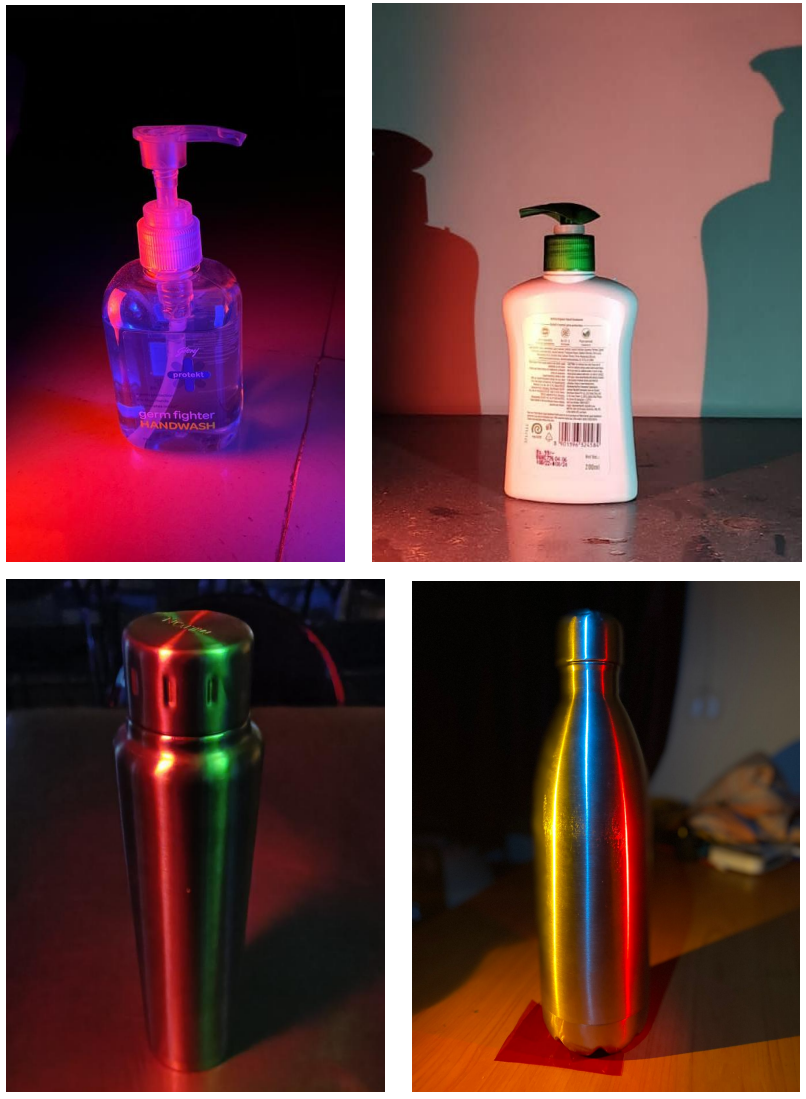
(Fig. 50): A slide from the step by step guide to do the assignment



(Fig. 51): A slide from the step by step guide to do the assignment

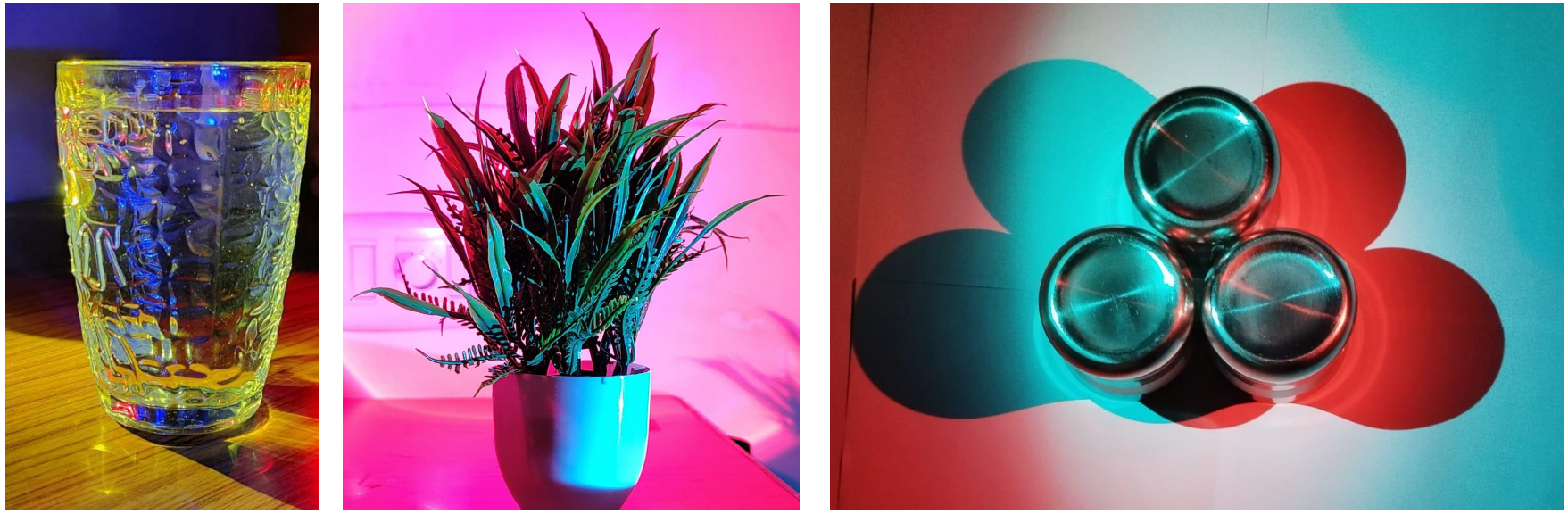
(Fig. 52): Introduction to colour mixing at a HASMED[1] class

(Fig. 53): Explaining the assignment with the help of other TAs



(Fig. 54): Photographs by the students based on the assignment

(Fig. 55): Photographs by the students based on the assignment



(Fig. 56): Photographs by the students based on the assignment

Discussion with the students: The assignment was discussed in detail and the students were given feedback on how they could have improved upon or explored more using the objects they had chosen for photography. The following observations were made during this activity -

1. Colour mixing was best observed while using transparent, white or metallic toned objects
2. While they thought that adding more coloured lights would make the scene more interesting, more that 2 coloured lights would mix to give almost white light
3. Almost all students used curved surfaces since colour mixing on sharp edged surfaces was very difficult to achieve
4. Since students were using phone torches, most were not able to get a strong source of light to get good results - the activity should be suggested to be done with strong torches
5. Some students were able to achieve both additive (on object surface) as well as subtractive mixing (with shadows) in their photographs

Game Activities: The game activities are designed in such a manner that they require the relevant topics to be taught and be understood by the students first. Hence, they were tested out with students in the first year of their B.Des course at IDC.

Method: Play testing to test whether the students are able to successfully complete the instructions in the game. Since the second game activity ‘Change 2’ is subjective in nature, it was evaluated in an open non-competitive format where the students were free to discuss and help each other out

(Fig. 57): Students playing the game ‘Culo’

High Engagement: It was observed that the Game ‘Culo’ had high engagement among the students for the following reasons -

1. Students insisted on playing another round despite mentioning the evaluation only required them to play 2 rounds
2. Tried to peek into other’s cards
3. Were forming alliances towards the end of the game
4. Were vocal about cheering/ teasing each other, pointing out others cheating, picking up card on missing turn, putting down extra cards, etc

Observations for the game ‘Culo’

1. For the first round, only Complementary or Analogous schemes were used, but in the 2nd round onwards, Triadic and Tetradic schemes were used more and more often.
2. One person left after the first game due to not being able to play well, but all those who stayed insisted on a third game.
3. Time taken for each round significantly improved from first game to second. Third was similar to second - Learning curve is steep at first

Interesting revelations were made by the students while playing eg: Red is complementary to Green, and Orange to Blue - so a Red Orange is also complementary to Blue Green on the colour wheel; All Primary colours make a Triadic scheme, and all Secondary colours make one too.

Feedback from the students

1. Top right has inverted text - should be opposite
2. Need a reference with colour names written on the wheel
3. More explanation about rules before starting - eg: can you go either side for an Analogous scheme

Observations for the game ‘Change 2’

1. Based on the Card game, students were able to make quick associations about what colours to use
2. Since they had not previously learnt about Value and Saturation, there was some confusion as to why contrast is not same for all complementary colours
3. Students were not as excited since this was not a competitive format, but were eagerly helping each other out

Feedback from the students

1. Students mentioned that this was very helpful in learning basics and a very fun way to learn about colour schemes
2. They added this activity could be in a game format with points for each player to make it more fun

(Fig. 58): Students playing the game ‘Culo’

FUTURE SCOPE

Further work on Lessons - Colour Psychology

A lot of work was done on colour psychology in the 1900s by prominent professors like Kandinsky, Itten, Paul Klee but due to lack of scientific evidence and proper research, it has not continued to be a part of curriculum in most schools.

It is subjective to each individual, it may vary due to life experiences, traditions, culture, region, politics, etc
Lesson plan, assignments and evaluation need to be designed with a lot of thought and care. Further work is required in this area

Further work on Evaluation

The HASMED[1] course will continue for different batches of first-year Engineering students with weekly interactions between Teaching Assistants and the students. Thus, small activities and assignments can continue to be implemented in the coming sessions.

CITATIONS/ REFERENCES

[1]HASMED Course: In an attempt to overhaul its Engineering Undergraduate (UG) curriculum to meet the changing trends, IIT Bombay has introduced non-engineering subjects such as Humanities, Arts, Social Science, Management, Entrepreneurship, Design. This curriculum will be followed along an interdisciplinary STEM (Science, Technology, Engineering, Mathematics) approach, which will be combined with the core engineering subjects of a specific branch that a student is pursuing.

[2]Ebigbagha, ZS. “Colour Studies: Clarification and Alpha-Numeric Adaptation of Notation Systems for Artists and Designers.” *AFRREV IJAH: An International Journal of Arts and Humanities*, vol. 4, no. 2, 2015, p. 28. *AJOL*, https://www.ajol.info/index.php/ijah/article/view/118903.

[3]Ghai, Swasti Singh, and Chaula Patel. “ELEMENTS OF COLOUR: A cultural approach | Swasti Ghai and Shekhar Bhattacharjee.” *Academia*, 2015, https://www.academia.edu/37420058/ELEMENTS_OF_COLOUR_A_cultural_approach. Accessed 19 November 2022

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APPENDIX

[20] Lesson 1: Introduction to Colour

Introduction to Colour

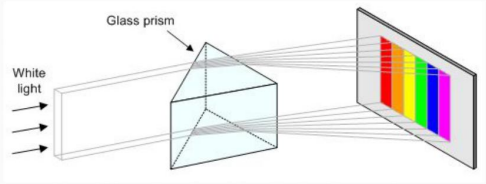
Lesson 1

Comic by Johnny Hart

How would you describe the colour yellow to a blind person?

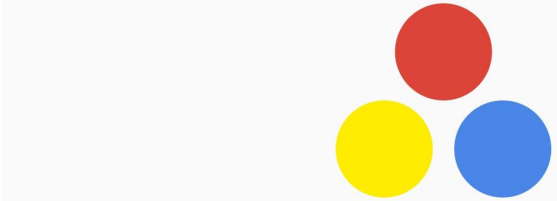
The physics of colour

Newton’s prism experiment



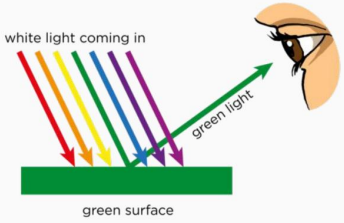
In 1676, Sir Isaac Newton, using a triangular prism, refracted white sunlight into a spectrum of colours. He was able to show that blue light, for instance, when refracted through a second prism yielded again only blue light.

These unique colours make up the visible spectrum of the human eye.



A person with normal vision can identify a red that is neither bluish, nor yellowish; a yellow that is neither greenish, nor reddish; and a blue that is neither greenish, nor reddish.

These form the **Primary Colours**.

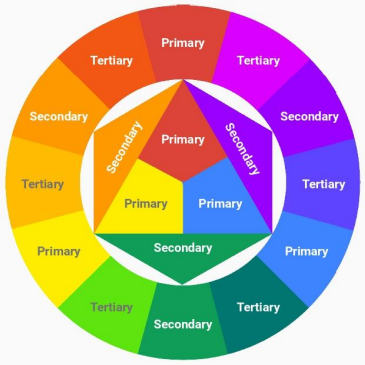


When light hits an object, the object reflects some of that light and absorbs the rest of it. Some objects reflect more of a certain wavelength of light than others. That’s why you see a certain colour.

For example, grass reflects mainly green light and absorbs the rest

Objects that absorb all wavelengths of light appear black. Objects that reflect all wavelengths of light appear white.

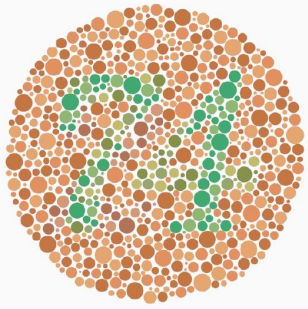
Activity 1



Secondary colours are made up of a mixture of adjacent Primary Colours.
Yellow + Red = **Orange**
Yellow + Blue = **Green**
Red + Blue = **Violet**

Tertiary Colours are made up of a mixture of adjacent Secondary Colours. A colour can be "Blue-Green", "Yellow-Red", "Yellow-Green", etc - but never "Yellow-Blue" or "Red-Green"

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



Ishihara Colour Blindness Test Image

There are three types of cones in a normal human eye which helps us identify colours:

Red, Green and Blue

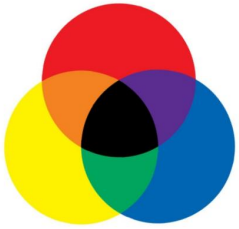
Each type responds to different wavelengths of light. Long wavelengths stimulate red cones. Short wavelengths stimulate blue cones. Medium wavelengths stimulate green cones. When different combinations of cones are activated, you see the world in colour.

Mix the Red and Green pigments from our last activity. What colour do you get?

Activity 2

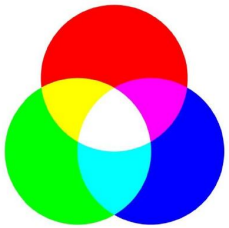
What colour will we get when we mix Red and Green coloured lights?

Subtractive Model



Using pigments, inks, physical colours

Additive Model



Using coloured lights

Image Sources: Pinterest

You could make use of coloured glass/ sheets, CDs, reflecting objects, coloured lights, etc for the assignment

Assignment 1

Work in groups of 3-4
Submission: Next class

Capture multiple photos where you are modulating light or playing with coloured objects to create interesting mixtures.

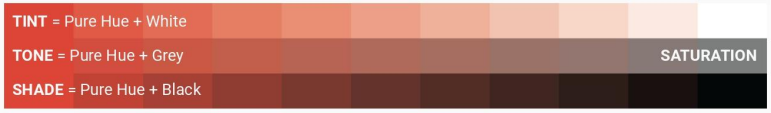
Select at least 3-4 unique photos for submission.

Hue

Hue is 100% pure colour from the visible spectrum (VIBGYOR). Hue is what most people think of when using the term 'colour.' Examples of hues are: red, orange, yellow, green, blue, violet.

Value & Saturation

Value refers to the lightness or darkness of a colour. With pigments, a **Tint** is a mixture of a colour with white, which increases lightness, while a **Shade** is a mixture with black, which increases darkness. A **Tone** is produced either by mixing a colour with grey, which is also known as that colour's relative **Saturation.**



Assignment 2

To be done individually
Submission: Next class

Create a duplicate of the following document, rename it and complete all the exercises -

Assignment 2 - Link to document

[21]Lesson 2: Colour Schemes

Colour Schemes

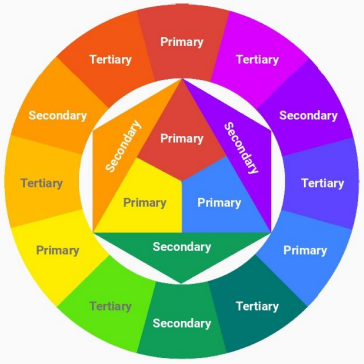
Lesson 2

Colour Wheel

Basic 12 colour wheel - 3 Primary, 3 Secondary, 6 Tertiary

Subtractive Model

(Inks, Pigments, Paints, Dyes, etc)



Colour Schemes

A colour scheme consists of a combination of colours consisting of one or more of the twelve colors present on the color wheel.

By using colour schemes you can easily create palettes to use in any design. Different color combinations evoke different meanings

Pierre Auguste Renoir – "Portrait Of A Young Girl"

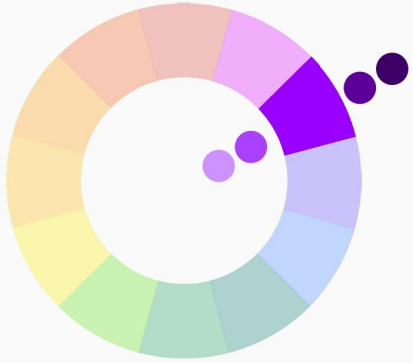
Decor by TLC Interiors

Illustration by Keith Negley

Monochromatic

Uses only one colour - combination of Tints, Tones and Shades of a colour

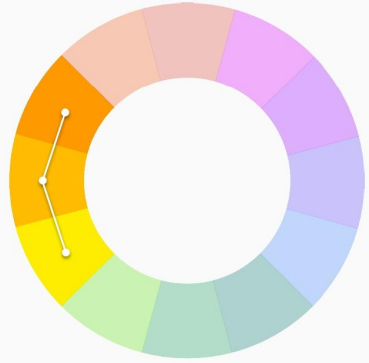
This scheme is used to produce a consistent look and feel - clean and subtle.



Analogous

Uses three colours next to each other on the colour wheel and relevant tints/shades of those colours

This scheme has a very harmonious appeal.



Painting by Carol Marine

Nolan N-60 Helmet

Adidas Shoes

Van Gogh "Self-Portrait as a Painter"

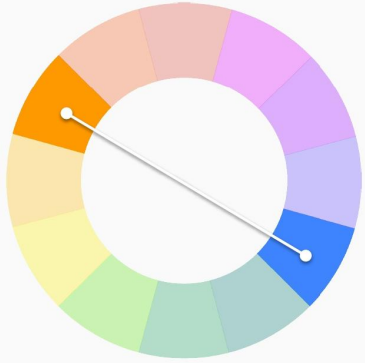
Mountain Dew logo

Scene from movie 'La La Land'

Complementary

Uses two colours directly across from each other on the colour wheel and relevant tints/shades of those colours

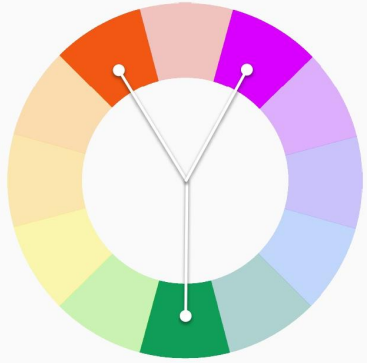
This scheme is used to create high contrast

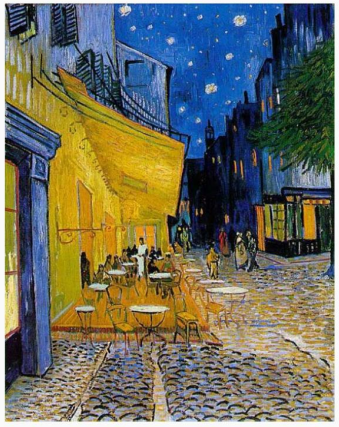


Split - Complementary

Uses three colours with a base hue and two adjacent colours to the colour which is directly across from the base hue.

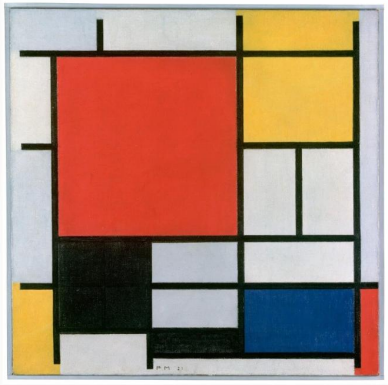
The split-complementary color scheme has the same sharp visual contrast as the complementary color scheme but has less pressure.



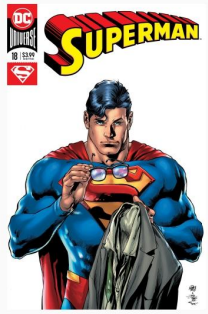


Van Gogh "Café Terrace on the Place du Forum"

Images from acrylgiessen.com



Piet Mondrian Painting



DC Superman

Burger King Logo

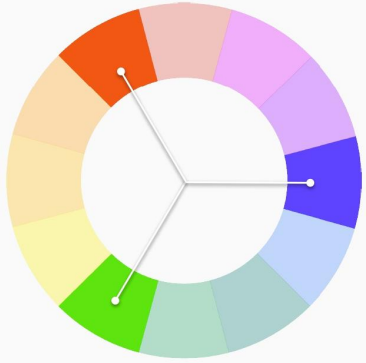
Marilyn Monroe by Andy Warhol

Triadic

A triad consists of three colors that are placed equidistant from each other on the color wheel and relevant tints/shades of those colours

Triadic color schemes can include three primary, secondary, or tertiary colors.

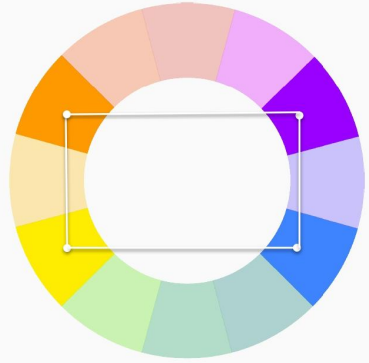
It provides sharp visual contrast while maintaining balance, and color richness.



Tetradic

It uses four colors arranged into two complementary color pairs forming a rectangle.

This scheme is very rich but hard to harmonize and requires a color to dominate or subdue the colors; if all four colors are used in equal amounts, the color scheme may look unbalanced.



Crossing Madison by Patti Mollica

Interior by Melaine M.

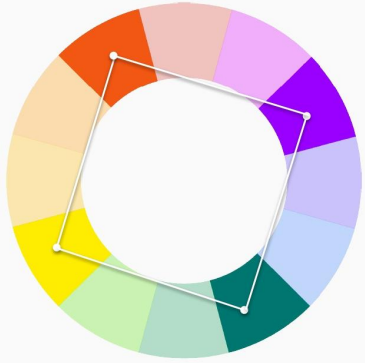
Upper West Side by Patti Mollica

PAI Health Website

Square

The square colour scheme uses four colours equidistant from each other on the colour wheel to create a square or diamond shape.

It is more harmonious than tetradic schemes but offers similar richness to the palette.



[22] Lesson 3: Interaction of Colour

Warm & Cool

Compare "yellow" to "blue" and it's easy to see yellow is warm and blue is cool. Comparing "red" to "magenta" might be less obvious since they are next to each other. The easiest way to do this is to look at the color it leans towards on the primary or secondary wheel. If it's closer to red or yellow, it's a warm colour; and if it's closer to blue or green - it's a cool colour

In most cases, warm colours advance, while cool colours recede. This is because our eyes adjust when focusing on colours of different wavelengths. For example, red light waves have a longer wavelength than blue ones. This affects how our eyes perceive depth, even in 2-dimensional applications like painting or web design.

Assignment 3

To be done individually
Submission: Next class

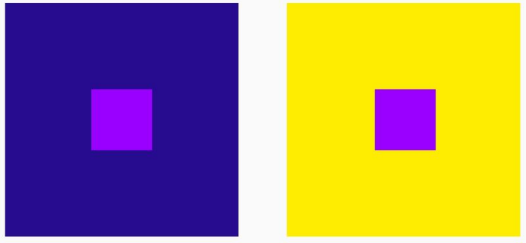
Create a duplicate of the following document, rename it and complete all the exercises -

Assignment 3 - Link to document

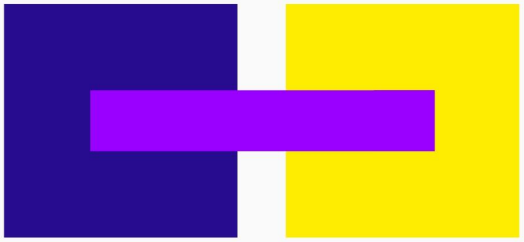
Colour Interaction

Lesson 3

Which violet is lighter?



Turns out they're both the same shade of violet



Itten's Contrasts

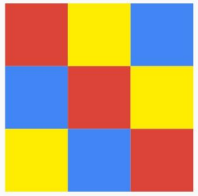
Every colour is seen in relation to another colour. When you see two or more colours together they have a profound effect on one another.

The study of colour interaction helps us understand and predict how a colour will be influenced by its surroundings

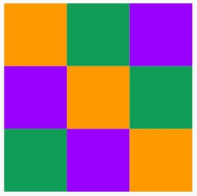
1. Contrast of hue

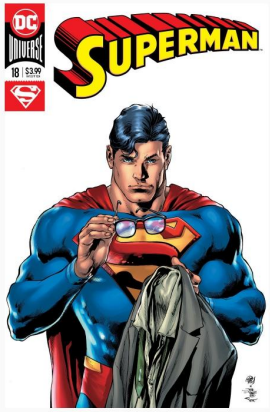
Contrast is created by the use of different hues. The intensity of the contrast reduces as the hues move further away from the primary colors

Extreme contrast with Primary colours

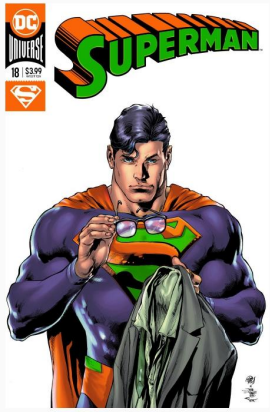


Less impact with Secondary colours





DC Superman



With juxtaposed secondary colours

2. Contrast of value/ saturation

Contrast is created by the use of different values. It could either be of the same colour or different colours. A pure colour may be diluted with:

White - rendering it's characteristics somewhat colder

Black - depriving colours of their quality of light

Gray - resulting in a less intense colour

Illustration by Keith Negley

Same illustration with less difference in values reduces the overall contrast, removes depth

3. Contrast of warm and cool

Warm colors such as red, orange, yellow, and browns evoke a feeling of warmth and comfort, and are attractive to the viewer. As a result, objects painted this color appear to move forward. Cool colors, such as blue, green and grays, recede into the background. The contrast of warm and cool can be used to create nearness and distance.

Photograph by Erol Ahmed

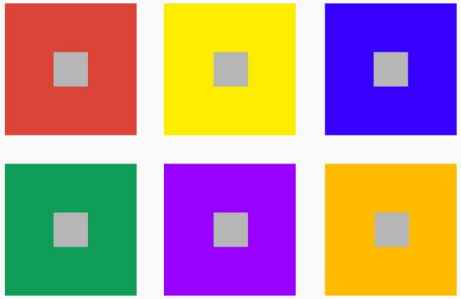
4. Complementary Contrast

A Complementary contrast exists when two complementary colors are placed side-by-side. Used in the right proportions complementary colors give the effect of a statically fixed image. Each color stands unmodified by its intensity stabilizing effect

Scene from La La Land

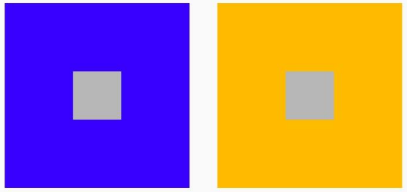
Removing yellow makes the purple background stand out too much

What are your observations about the grey squares in the centre of different colours?



5. Simultaneous contrast

Although the two grey squares are the same - along with appearing different in value - light or dark, the square inside the Blue will look like an orange-grey while the one inside orange looks bluish (opposites to each other on colour wheel)



6. Contrast of Proportion

is based on the relative areas of two or more areas of color, such as large and small. If a small bright spot contrasts with a large area of darkness the picture receives an increased significance

Pieter Brueghel's Landscape With the Fall of Icarus

We find that the intensities or light values of the several hues are different.

Goethe set up simple numerical ratios for these values.

They are approximate - ultimately, vision must decide.

In converting these values to harmonious areas, we must take the reciprocals of the light values; that is, yellow, being three times as strong, must occupy only one-third as much area as its complementary violet.

Goethe's light values are as follows:

Yellow : Orange : Red : Violet : Blue : Green = 9:8:6:3:4:6

Harmonious proportions for complementary pairs:

Yellow: Violet = 1/9:1/3 = 1:3

Orange: Blue = 1/8:1/4 = 1:2

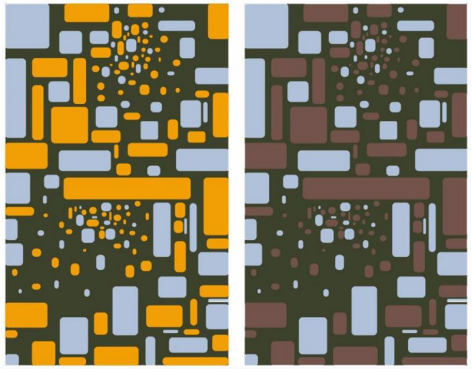
Red: Green = 1/6:1/6 = 1:1

Scene from La La Land

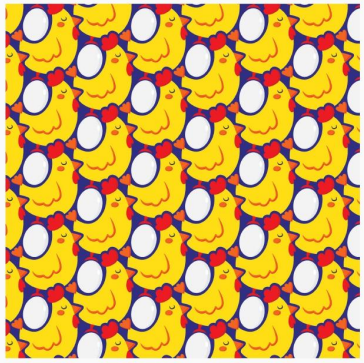
Adding more yellow to the composition makes it unbalanced, and attention goes to only the yellow part

Bezold Effect

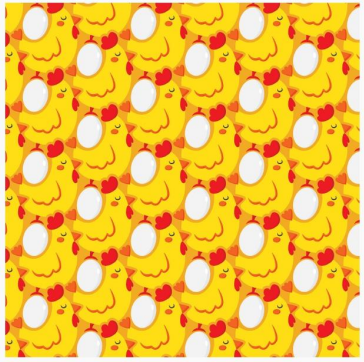
There is a special kind of optical mixture, the Bezold Effect, named after its discoverer, Wilhelm von Bezold (1837–1907). He recognized this effect when searching for a method through which he could change the colour combinations of his rug designs entirely by adding or changing 1 colour only.



Bezold Effect by Alvalyn



Tessellation by Shweta Ratanpura



Changing even one colour can completely change the feel of a composition

Assignment 4

To be done individually
Submission: Next class

Create a duplicate of the following document, rename it and complete all the exercises -

Assignment 4 - Link to document

[24] Assignment 1: Introduction to Colour

Assignment 1

Work in groups of 3-4
Submission: Next class

Capture multiple photos where you are modulating light or playing with coloured objects to create interesting mixtures.

Select at least 3-4 unique photos for submission.

Image Sources: Pinterest

You could make use of coloured glass/ sheets, CDs, reflecting objects, coloured lights, etc for the assignment

[25] Assignment 2: Introduction to Colour

Assignment 2

Introduction to Colour

Student Details

Name:

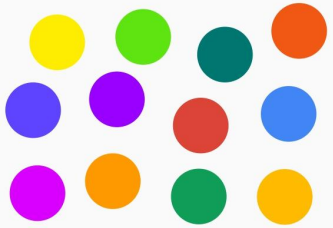
Roll No:

Department, Year:

Pick the Primary colours from the following and place them on the right

Primary Colours

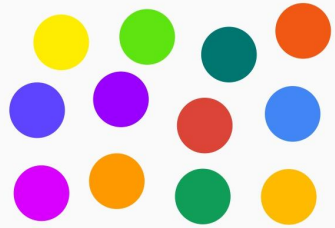
Pick and place colours from here



Pick the Tertiary colours from the following and place them on the right

Tertiary Colours

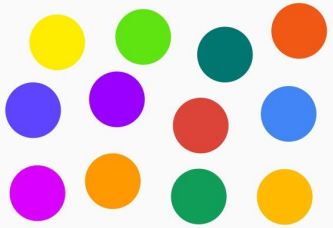
Pick and place colours from here



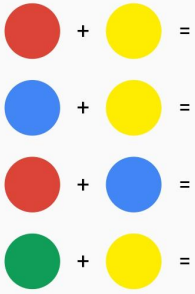
Pick the Secondary colours from the following and place them on the right

Secondary Colours

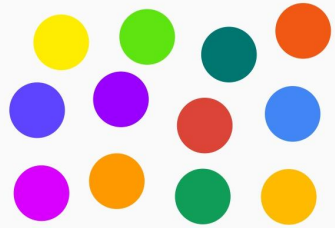
Pick and place colours from here

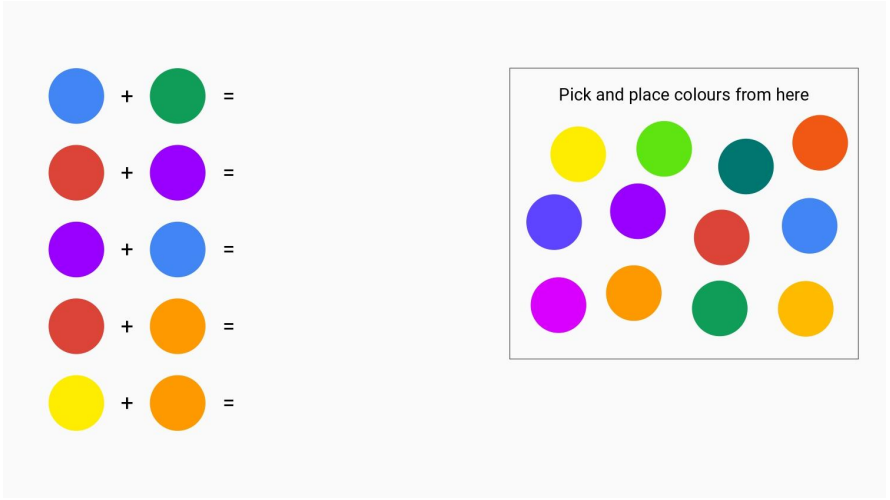


Pick the correct colour according to colour mixing

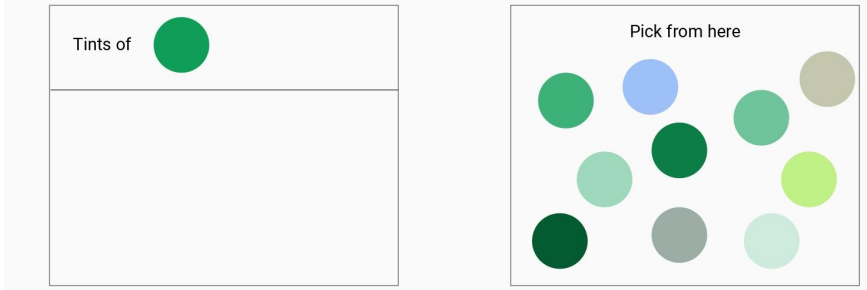


Pick and place colours from here

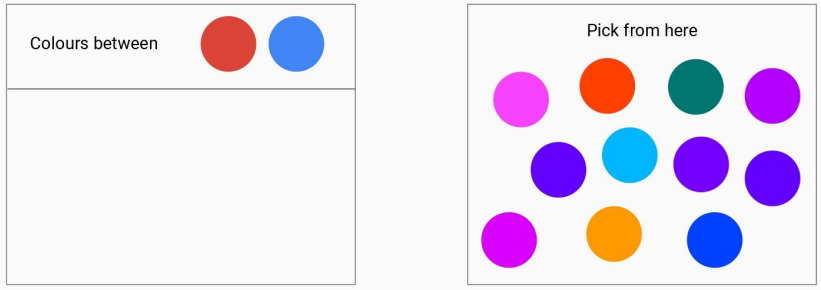




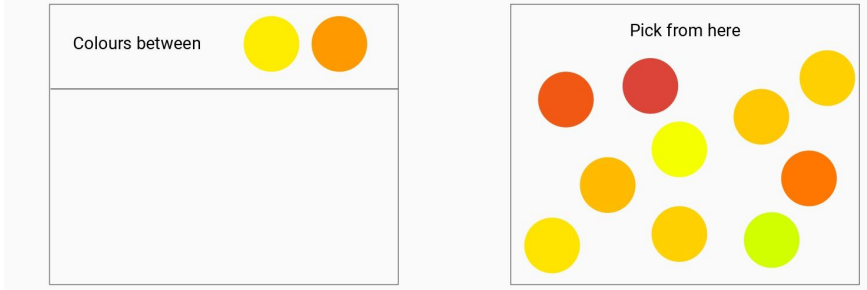
Pick **Tints** of the Green colour given below



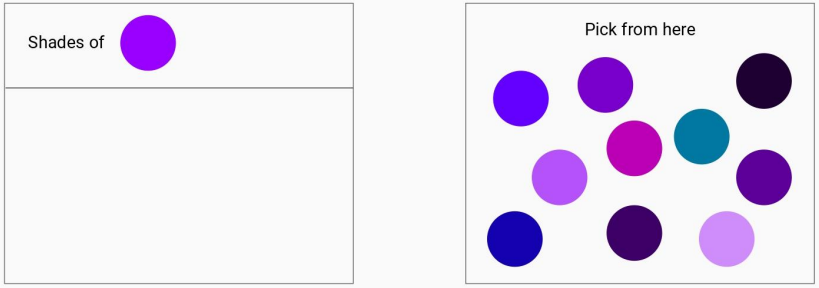
Pick all the colours that lie between Red and Blue



Pick all the colours that lie between Orange and Yellow



Pick **Shades** of the Violet colour given below



Student Details

Name:

Roll No:

Department, Year:

[26] Assignment 3: Colour Schemes

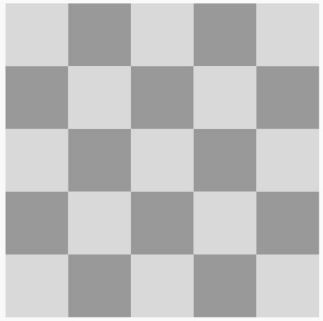
Assignment 3

Colour Schemes

1

Complete the composition by filling the squares with colours using Monochromatic colour scheme.

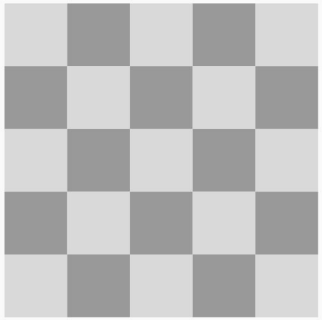
Try to produce a consistent look and feel - clean and subtle.



2

Complete the composition by filling the squares with colours using Analogous colour scheme.

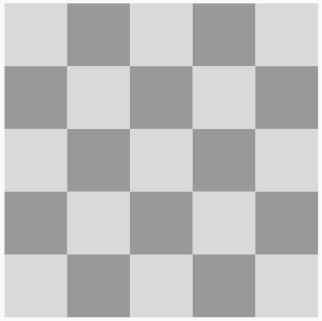
Try to create a harmonious look



3

Complete the composition by filling the squares with colours using Complementary colour scheme.

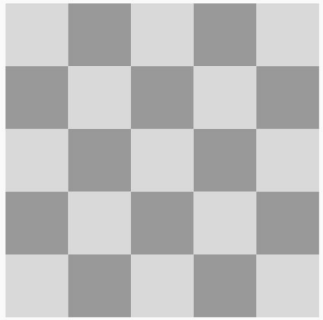
The composition should have high contrast



4

Complete the composition by filling the squares with colours using Split-Complementary colour scheme.

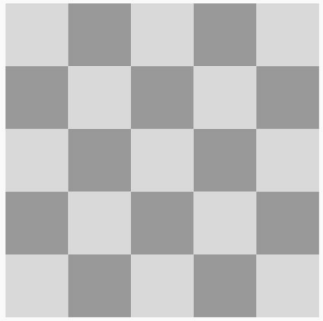
The overall look should have subtle contrast



5

Complete the composition by filling the squares with colours using Triadic colour scheme.

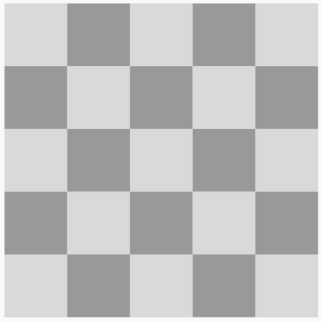
This composition should be balanced but still have contrast.



6

Complete the composition by filling the squares with colours using Tetradic colour scheme.

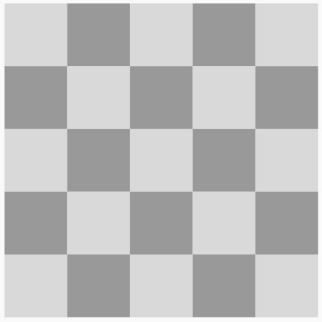
Try to use the colours in unequal quantities or else the composition may look too jarring.



7

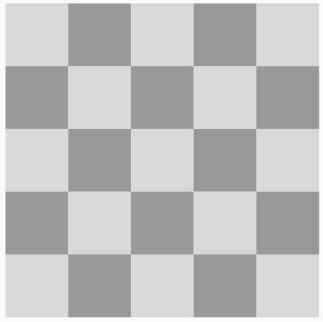
Complete the composition by filling the squares with colours using Square colour scheme.

The finished look should be rich and vibrant.



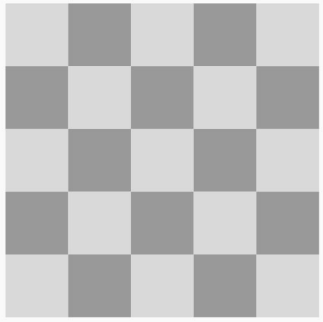
8

Complete the composition by filling the squares with colours using warm colours



9

Complete the composition by filling the squares with colours using cool colours



[27] Assignment 4: Colour Interaction

Assignment 4

Colour Interaction

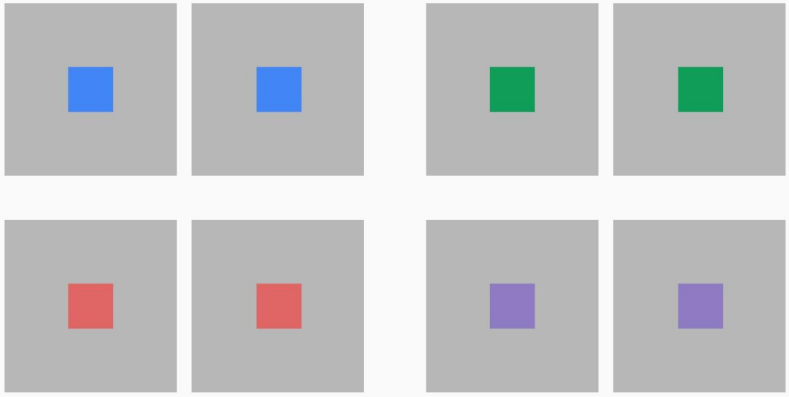
Student Details

Name:

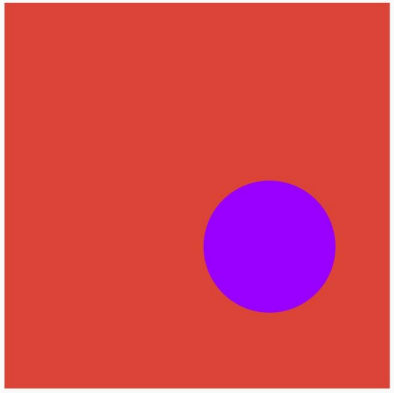
Roll No:

Department, Year:

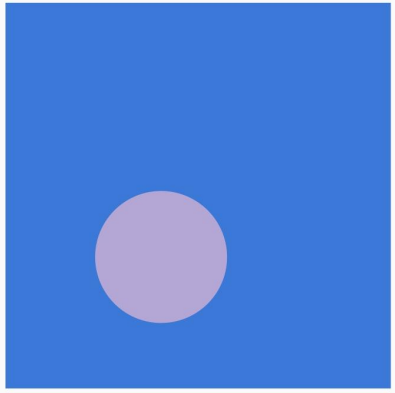
Try to make the colours in the centre look different by filling the outer squares with appropriate colours



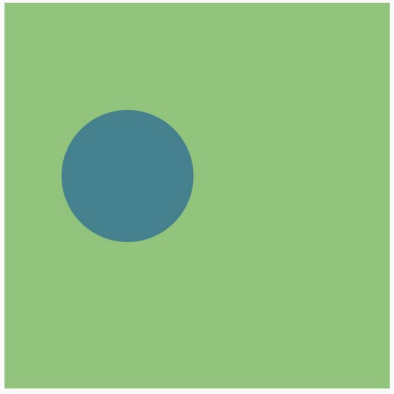
Increase the contrast between the circle and the background square by ONLY changing the colour of the circle



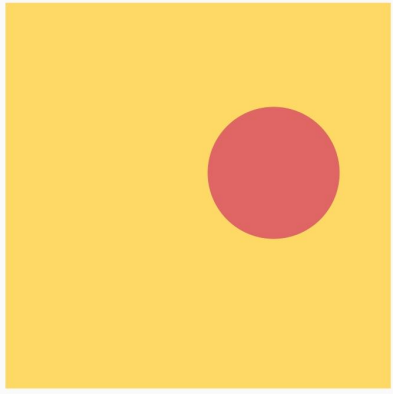
Make the circle appear moving forward/ stand out from the background square by ONLY changing the colour of the circle



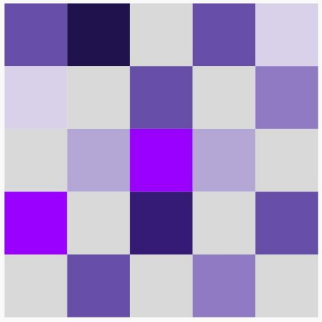
Increase the contrast between the circle and the background square by ONLY changing the colour of the square



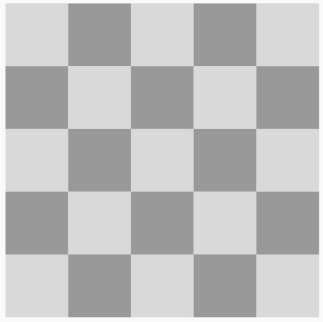
Make the circle appear moving forward/ stand out from the background square by ONLY changing the colour of the square



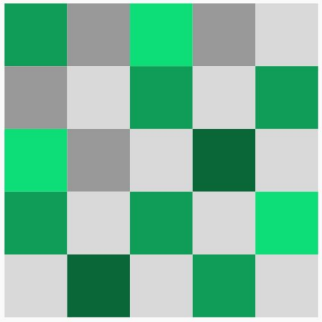
Make the composition appear harmonious by filling it with shade/tints of only 1 hue



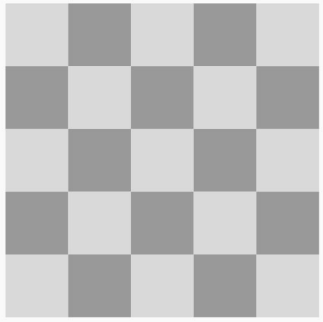
Fill in the composition with tints/shades of hues of any 2 colours to make it harmonious



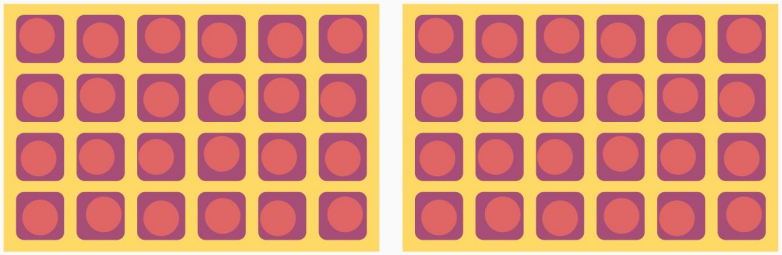
Make the composition appear harmonious by filling it with shade/tints of only 1 hue



Fill in the composition with tints/shades of hues of any 3 colours to make it harmonious



Change the colour of any 1 element (either the background, the rounded squares or the circles) from the pattern on the right to make a drastic change in the look and feel of it.



Make changes here ^

Please watch this video before proceeding with the assignment

https://www.youtube.com/watch?v=5fq5KMwlrVQ&t=2s

[28]HASMED Assignment

HASMED Short Assignment 5

Colour Mixing

Photography Assignment

Work in groups of 3-4
Submission: Sunday 20 November

Read the following pages for how to do the assignment

You will have to click multiple photographs and select any 3 from them for submission

For this assignment you will be given 2 sheets of coloured translucent paper. You can use phone torches to shine light through them to make coloured light. Apart from this you can also use your laptops with a colour screen at full brightness.

Please note: Do this activity in a dark environment (preferably at night) to achieve desired results

Step 1

Choose any object that you would like to photograph

Step 2

Capture object in only 1 coloured light at a time

Step 3

Capture object with two coloured lights focused on the object from different directions

Step 4

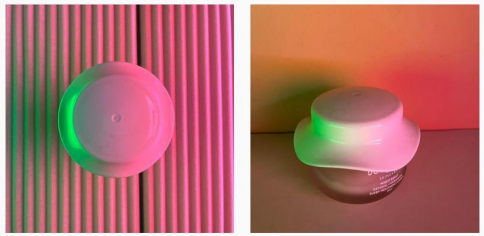
You can try capturing the object from different angles

Step 5

You can even introduce props - like a stand, cloth, or even your hand

Step 6

You can experiment with different backgrounds - introduce coloured tiles, even textured base, mirror - anything!



Step 7

Using other materials or screens, you can try the same experiment with other colours or other objects