Design and Color

careertech

RCCTA Resource Center for CareerTech Advancement

Design and Color

Objective Sheet

Specific Objectives

After completing this unit, the student should be able to:

1. Match terms related to principles of design and color to their definitions.

2. List functions of design.

3. List types of publication design.

4. Select the components of printed communication.

5. Arrange in order the steps in the design process.

6. Discuss factors to consider when applying principles of document design.

7. List the two basic types of art and sources for each type.

8. Match color descriptions to their definitions.

9. Select true statements concerning pointers on using color.

10. Complete statements concerning color theory.

11. Complete statements concerning color harmonies.

12. Distinguish among computer color models.

13. Select true statements concerning the basic categories of color printing.

14. Select true statements concerning the Pantone Matching System.

Information Sheet

Terms and definitions

Note: Please refer to the Key Terms for definitions.

Align	**Element**
Brightness	**Emphasis**
CIE	**Line art**
Color harmony	**Logo**
Color model	**Primary colors**
Comprehensive layout	**Publication design**
Contrast	**Rough layout**
Continuous tone art	**Screen tint**
Desaturate	**Thumbnail sketch**
Design	**White space**

Functions of design

> **Key Terms**
>
> **Design**—The plan and arrangement of graphic elements
>
> **Element**—Each individual portion of the printed message, such as the heading, photograph, illustration, text, rule, and/or border

a.   Attract, then hold attention of desired audience

b.   Make message easy to read

c.   Create a clear, orderly flow of graphic **elements**

d.   Leave a lasting impression

e.   Use appropriate technology to deliver the message efficiently and economically

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Types of publication design

> **Key Term**
>
> **Publication design**—Combines technical detail with artistic flair to make content (images and text) available to a particular audience while establishing a spirit or image and format for a publication

    a.   Books

    b.   Magazines

    c.   Newspapers

    d.   Newsletters

    e.   Miscellaneous publications

        Examples: Leaflets, folders, booklets, brochures, catalogs, directories, training manuals, annual reports, calendars, yearbooks, and other pieces produced by advertising agencies, public relations firms or departments, independent art studios or freelancers, and commercial and in-house print providers

        Note: Regardless of the type of printed piece, the principles of design are unchanging. However, the designer has a freer hand in designing miscellaneous publications.

Components of printed communication

> **Key Terms**
>
> **Logo**—A symbol that represents a company brand in the marketplace, consisting of logotype, a brand symbol, or the unification of both
>
> **Screen tint**—Area of image printed with dots so ink coverage is less than 100% and simulates shading or a lighter color
>
> **White space** (negative space)—Space not occupied by type, art, or other graphic elements

    a.   Body type (text)

    b.   Display type (headings)

    c.   Art

    d.   Other graphic devices, such as **logos,** rules, borders, and **screen tints**

    e.   **White space**

Objective 5	**Steps in the design process**

Note: People design documents—computers don't. Follow the design process outlined in this objective to develop quality document designs.

> **Key Terms**
>
> **Comprehensive layout**—The layout of an advertisement that is created to scale on the computer and used for presentation to the client; also called **comprehensive design** or **comp**
>
> **Rough layout**—A rough mockup of a document laid out on a grid at actual document size
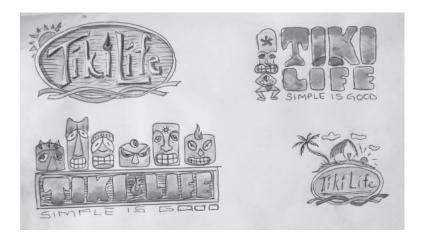>
> **Thumbnail sketch** (thumbnail)—A small, quick pencil drawing created on paper or computer that is used to develop and reject ideas as necessary before moving on in the design process

a. Define the project, including its purpose and its audience.

- Determine the document's purpose and the overall message you are trying to achieve.

- Develop an idea of the various graphic elements that will be involved in creating this overall message, and then decide on an order of importance for those various elements.

- Before you begin, answer the following questions:

  — Who is my audience?

  — What style should I use for this audience?

  — What is the purpose of this design?

  — What is the message or information the client is trying to send?

  — Where will it be seen?

b. Create **thumbnail sketches**.

- To save time possibly spent in retrying the same design idea several times during the design process, it is a good idea to make notes to yourself about why you rejected a certain design.

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c. Create a **rough layout**.

- Rough layouts are used to further develop designs you have selected during the second step of the design process. Experienced designers prepare rough layouts on the computer.

d. Prepare a **comprehensive layout**.

e. Proof, edit, and revise comprehensive as necessary.

f. Print final copy.

Objective 6 | **Principles of document design and factors to consider when applying them**

> **Key Term**
> _____
>
> **Align**—To arrange elements so they line up with other elements

Note: The design principles discussed in this objective are not listed in order of importance. They are considered *interactive*—each principle should support the other.

a. Purpose

   • Determine the document's purpose and the relative importance of the information you want to communicate.

   • Theme should be based on the audience and purpose.

b. Visual hierarchy

   Note: Visual hierarchy is based on importance.

   • Emphasize important elements.

   • Organize content logically.

   • Use layout to lead the reader's eyes through the page.

   • Avoid distracting, unnecessary graphic elements.

c. Balance

   • Elements on the page should give a sense of wholeness.

   • Use an appropriate proportion of text to graphics.

   • Use complementary colors.

   • Create balance around the page's focal point.

d. Coherence

   • Strive to create a coherent document design by judging the appropriateness of each design element as it relates to the other elements and to the document's purpose.
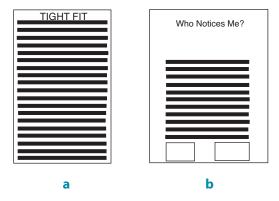
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e. Proximity

- Group together those items that belong together.

- Remain conscious of the white space between page items and of what that space implies.

f. Proportion

- Determine size of all design elements in relation to their importance.

Note: There are no absolutes concerning appropriate proportion in document design. Visualization of a design is important in determining the appropriateness of each design element in the document. For example in Figure 3a, it is easy to see that the large headline cramped into a small space looks out of proportion, and likewise, does the small headline placed in a large space).
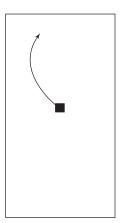

a   **b**

g. Alignment

- Items on the page should **align** appropriately.

- Avoid center-aligning elements.

- Left alignment is often a cleaner look because it creates a stronger line.
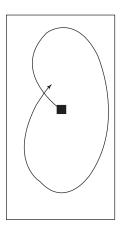
h.   Contrast

- Decide whether the document's purpose dictates that its design maintain either high or low contrast, which refers to the relative amount of space devoted to text, graphics, and white space.

- Provide variety by utilizing different colors, shapes, sizes, etc.

- Use contrast to set off the various elements of a page.

Note: Depending upon the purpose of your document, you can create designs of either high or low contrast. For example, advertisements tend to have high contrast—the document design has definite light and dark areas with lots of white space and illustrations. However, business reports tend to have low contrast—there are more dark areas or blocks created with type and less white space used throughout these documents.
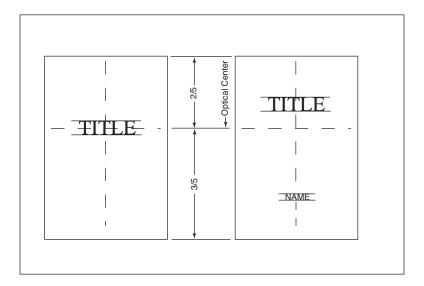
i.   Direction (sequence, movement)

- Determine a logical directional pattern for the reader's eye movement as he or she reads the document.

- The design elements you use should guide your reader's eye from point to point in the document, usually following a pattern that begins at the optical center of the design and continues in a clockwise direction to the upper left and around to the lower right.

- The optical center of a design is not a true mathematical center of a page, but rather $2/5$ of the way down a page that has been divided into five equal parts. Important design elements are placed at or above the optical center of a page for an aesthetically pleasing design.
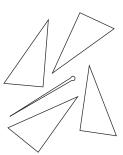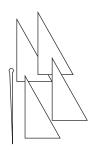

j. Unity

- Assemble the various design elements so that they fit together as a harmonious unit where the individual design elements appear to be related and held together by a single theme.

- When design elements are not unified, they appear randomly placed and disjointed.

k. Discipline

- Apply design elements in moderation.

Note: Discipline may be the most difficult design principle to apply. You have a tremendous amount of design features at your fingertips, making it easy to get carried away by using too many of them in one document.

Objective 7 | **Working with art**

Key Terms

Continuous tone art—Photographs, paintings, and other images having a completed range or variation of tones from white to black

Line art—Any solid image consisting of black lines on white background without gradation of tones

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a. Basic types of art

- **Line art**

- **Continuous tone art**

b. Factors that affect art selection

- Availability

- Appropriateness

  — Photographs are more realistic, because they can convey believability and credibility.

  — Drawings are less "real" and are more effective with abstractions.

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- Quality

- Mechanical feasibility

- Cost

c. Sources of art

- Continuous tone art

  — Your own photographs

  — Professional photographers

  — Stock photo houses that sell photos for one-time use or sell a license for multiple use

  — Photos from government agencies, trade and professional organizations, businesses, chambers of commerce, etc.

- Line art

  — Your own drawings

  — Artists and illustrators

  — Clip art

  — Public domain sources

  — Drawings from government agencies, trade and professional organizations, businesses, chambers of commerce, etc.

Objective 8	**Color descriptions**

a. Hue—The pure form of a color without considering how dark or vivid the color is; the name of a color

   Example: Maroon and pink are both based on a red hue.

b. Intensity—The purity or strength of a color

   Note: If a color is described as "less intense," it means that the color contains more gray.

c. Shade—Black added to a color to make it darker or the color opposite on the color wheel added for a more neutral color

d. Tint—White added to a color to make it lighter

e. Tone—Range of light values from white to black and bright to dull

f. Value—The lightness or darkness of a color; described in shades and tints

g. Chroma (Greek for color)—The purity of a color, or its freedom from white or gray; intensity of distinctive hue; saturation of a color

Objective 9   **Pointers on using color**

> **Key Term**
>
> **Emphasis**—Arrangement of elements that attracts attention to the most important element

a. Choose colors as dictated by message content, purpose, and audience.

b. One color should dominate.

c. When using more than one color, reserve the darkest for the basic message, using the additional color(s) for **emphasis** or setting a mood.

d. When colored inks are used on colored paper, best results will be obtained with a shade of the same color or a complementary color.

e. Type in color, or on colored stock, is dangerous; be concerned with readability.

f. Type printed in reverse should be within a fairly dark area.

g. Use four-color process sparingly; be sure the quality of the art warrants the cost.

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h. Exercise restraint in the use of additional color; generally a single spot of color is sufficient.

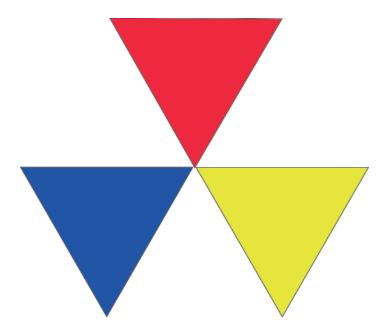i. Develop a library of color use by collecting good examples of pieces that use color effectively.

Objective 10

Color theory

> **Key Term**
>
> **Primary colors**—The three basic artist colors—red, yellow, and blue—from which all other color can be produced, at least in theory

a. **Primary colors**—Artist's color wheel, consisting of red, yellow, and blue

- Primary colors are the foundation of the color wheel.

- Primary colors are placed in the triangular position as shown in Figure 8.

Note: Primary colors cannot be mixed. They must be purchased in some form.

b. Secondary colors—Orange, green, and violet

- Secondary colors are formed by a combination of any two of the primary colors.

- Orange is made from red and yellow and should be placed equidistant between them.

- Green is made from yellow and blue and should be placed equidistant between them.

- Violet is made from red and blue and should be placed equidistant between them.

c. Intermediate colors—Red-orange, yellow-orange, yellow-green, blue-green, blue-violet, and red-violet

- Intermediate colors are formed by combining primary and secondary colors.

  Example: Red-orange is made from red and orange and should be placed between them on the color wheel.

d. Tertiary colors—Russet (orange and violet), citrine (orange and green), and olive (green and violet)

- Tertiary colors are formed by a combination of any two of the secondary colors.
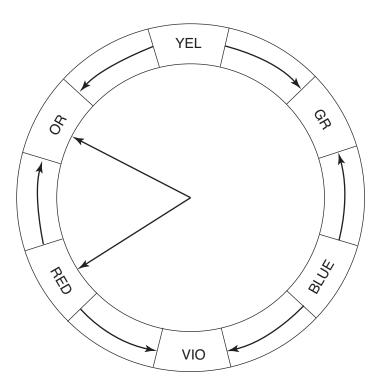
Objective 11

Color harmonies

Key Terms

Color harmony—Combination of colors that are in agreement or work well together to create different looks or feelings

Contrast—When two or more colors appear to be different in some way, such as yellow and black, light and dark, warm versus cool, etc.

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a. Analogous—Color palettes that are all warm or all cool

- Combining adjacent colors of the artist's color wheel will create **color harmony**.

- More than two adjacent secondary colors should not be used, as they will not harmonize.

b. Monochromatic—Two or more tones of one color

- Using colored stock with a darker shade ink of the same color will result in harmonious printing.

- On white stock, monochromatic harmony may be achieved by using dark colored type with tint blocks, rules, or borders.

c. Complementary—Two colors directly opposite of each other on the color wheel

- Complementary harmony forms **contrast** that attracts attention.

- Complementary harmony should not be used together in pure form, rather use one light and one darker color.

- Complementary colors look bright when placed next to each other and neutralize each other when mixed together.

d.   Split complements—Colors on each side of the complement may be used instead of the complementary color

- Use of split complements results in three-color printing.

e.   Triadic—Three colors that form a triangle

- The triangle that is formed on the color wheel by the primary colors of red, yellow, and blue may be rotated to any other combination of three colors to create triadic harmony.

- When using triadic combinations, they should not all be of the same strength or intensity.

  Note: One should be light, one dark, and the other halfway in between.

- Equal amounts of the colors should not be used, but a large amount of one, and smaller amounts of the other two will give harmonious results.

f.   Black, white, and gray

- Black, white, and gray may be used with any color or combination of colors and result in perfect harmony.

- Colors that do not harmonize may be brought into harmony by separating them with bands or edgings of black, white, or gray.

Information Sheet

| **Computer color models**

> **Key Terms**
>
> **Brightness**—The amount of light reflected from paper or emitted by a monitor
>
> **CIE**—A three-dimensional color model—L*a*b*—in which numbers locate colors along three axes, (L*) Hue, (a*) Saturation and (b*) Brightness and store this information; an integral part of device-independent, digital-print systems and color monitors
>
> **Color model**—A geometric or mathematical representation of visible colors mapped in a three-dimensional model using hue, lightness, and saturation; also called **color space** or **color modes**
>
> **Desaturate**—To remove the hue (color) gray

a. Color models for print products

   Note: Print results may vary depending on the calibration of the printer.

   • CMYK (**C**yan, **M**agenta, **Y**ellow and blac**K**)—A subtractive primary color model that subtracts or filters out reflective light from a white sheet of paper

      Note: Cyan, magenta, yellow, and black are called **process colors** or **four-color process**.

   — Each color in the CMYK model absorbs additive colors.

      – Cyan absorbs the additive light red.

      – Magenta absorbs the additive light green.

      – Yellow absorbs the additive light blue.

      – Black ink absorbs the additive light red, green, and blue.

         ⊠ **Note:** Black must be added to create an accurate photographic reproduction and to give a photograph better shadow detail.

   — Cyan, magenta, and yellow are the complementary colors of the additive primary colors.

   — White light interacts with a colorant (such as ink) which subtracts (absorbs or filters out) some of the colors from the white light and allows the unabsorbed colors to be seen by the eye.

   — When the cyan, magenta, and yellow inks are mixed together in various proportions, they produce a full range of colors.
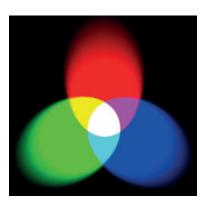
— The subtractive color (reflective color) model refers to the CMYK color space used by conventional and digital printing devices to produce full-color printing.

— When solid layers of the process colors are printed on a white sheet, they produce black.

— The three subtractive colors when combined, filter out parts of the color spectrum to create red, green, and blue, as well as a dark brown that appears to be muddy (black) when used as ink on white paper.

— Black is added to create a more accurate photographic reproduction, particularly in the shadow regions. The color (ink) black must be added to the three subtractive colors (inks): cyan, magenta, and yellow.

b.   Color models for on-screen use

- RGB (**R**ed, **G**reen, **B**lue)—An additive (because the colors are ADDED together to form white) primary color model used in color monitors and conventional and digital photography for filtering or mapping light to a digital color

  — RGB is the default color mode for Photoshop, Web, multimedia, and on-screen presentations.

  — Web Safe RGB turns the color numbers to hex numbers for easy color reference when designing Web pages.

  — RGB colors are brighter than CMYK colors.

— Scanners capture information by measuring how much RGB light is reflected off.

— The additive primary colors (red, green, blue) are produced by the light source, such as the sun or a computer monitor, and when equal amounts of RGB (red, green, blue) are added together, they produce the perception of white light.

– When one color is subtracted, the remaining two will form another color which is complementary to the subtracted color.

  Example: If the blue light is subtracted, the red and green will form yellow, which is complementary to blue.

– When overlapped, green and red form yellow; red and blue form magenta; and green and blue form cyan.

- HLS (**H**ue, **Li**ghtness, **S**aturation)—Color system that accurately maps a color model's digital values; composed of individual unique values for hue, lightness, and saturation

  Note: HLS is also known as **HSV** (Hue, Saturation and Value).

— Hue is the measurement of the wavelength of light as located when plotted onto a color model or color wheel.

— Lightness refers to when black and white are mapped independently from hue and saturation within a color model, which describes the degree of darkness or **brightness** of a particular color space, such as the **CIE** (Commission Internationale de l' Eclairage) Color Space.

— Saturation is the brightness of a hue (color) that is based on the location of a color inside a color model's three-dimensional location.

  Note: In the center of the color space is a black-to-white axis. As you move from the outside of the color wheel toward the center, you **desaturate** the colors making them gray, white, or black.

Objective 13	**Basic categories of color printing**

    a.   Process color—Used to reproduce full-color continuous-tone copy, such as color photos and paintings

- Uses the four process colors of cyan (process blue), magenta (process red), yellow, and black

- Requires separation to break down the original copy into the four process colors

- Requires registration to accurately position one printing plate over another so that all are in the correct relationship

    b.   Spot (flat) color—Used for specific colors or colors that cannot be reached with four-color process (metallic or fluorescent)

- Usually printed as solid areas for type, line art, or in lines, bars, boxes, and screened tints

- Used for the color reproduction of any black-and-white copy

- Designated by the number of colors: one color, two color (most common), three color, four color, etc.

- Requires a separate printing plate and a separate run of the press for each color, so the more colors used, the more expensive the job

Objective 14	**Pantone Matching System**

    a.   Pantone Matching System (PMS) is a color system for spot colors.

    b.   PMS is an international printing, publishing, and packaging color language.

    c.   It provides an accurate method for selection, presentation, specification, communication, matching, and control of color.

    d.   PMS is based on 11 Pantone colors (9 basic colors, plus black and transparent white), that when mixed in varying amounts, produce more than 500 different colors.

    e.   PMS includes colors that are numbered and arranged in a swatch book, which the designer looks through, chooses the color, and notes its number.

    f.   PMS is the most vivid and economical color system to print with when used appropriately; however, it is expensive to use numerous PMS colors on one job.

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Note: Usually no more than three PMS colors are printed on one job, because one color of ink is printed on the design at a time and designs must dry before the next color can be printed.

g.   You may use as many values of one color as you'd like, because all values of the same Pantone color used throughout a document count as only one color being used.