Lesson Plan

Course Title: Digital & Interactive Media
Session Title: Color Theory

Lesson Duration: 8 hours

Performance Objective:
Upon completion of this assignment, the student will be able to create a color scheme using appropriate color theory and RGB setting / CYMK values for each color.

Specific Objectives:
- Define terminology related to color theory
- Identify types of color schemes
- Develop a color scheme
- Identify the RGB values for drawing objects
- Design a color wheel using RGB values
- Establish the CYMK values for drawing objects

Preparation

TEKS Correlations (130.278):
(5) The student analyzes and applies design and layout principles. The student is expected to (F) identify and use color theory
(6) The student designs and creates digital graphics. The student is expected to (E) differentiate between the color mode selections in determining product output

Instructor/Trainer

References: Content Developer Knowledge

Instructional Aids:
- Color Theory Presentation
- Color Theory Notes Organizer
- Color Theory Notes Organizer Answer Key
- Activity #1: Color Scheme Sheets
- Activity #2 Instructions: Create a Color Wheel
- Activity #3 Instructions: Recreate a Paint Chip Sample
- Color Theory Test
- Color Theory Test Answer Key

Materials Needed:
- Copies of notes organizer, instruction sheets, and exam
- Colored pencils, color scheme coloring sheet
- Paint chip samples (students can obtain these from local stores that sell paint)

Equipment Needed:
- Computer and projector for presentation
- Computers with desktop publishing software capable of switching from RGB mode to CYMK mode for individual student use

**Learner**

Take a poll of the class on each student’s favorite and least favorite colors. Ask them “If the walls of the room were painted that color, what other colors should be used to decorate the rest of the room?” Write some of the color schemes on the board. Take a poll on the favorite scheme of the class.

*Note:* the objective of this exercise is to get the students thinking about which colors look good or are aesthetically pleasing to them.

**Introduction**

**MI**

<table>
<thead>
<tr>
<th>Introduction (LSI Quadrant I):</th>
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<tbody>
<tr>
<td><strong>SAY:</strong> “Have you ever printed something and the color on the printout wasn’t anywhere near the color on your computer screen?”</td>
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<td><strong>SAY:</strong> “Did it make you wonder if your printer ink cartridges needed to be replaced?”</td>
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<tr>
<td><strong>SAY:</strong> “Did it make you wonder if the monitor settings were off?”</td>
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<td><strong>SAY:</strong> “It’s probable that neither the ink cartridges nor your monitor is at fault. By the end of this unit on Color Theory, you will understand why there is a difference in the color output of the monitor and the printer.”</td>
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**Outline**

**MI**

<table>
<thead>
<tr>
<th>Outline (LSI Quadrant II):</th>
<th>Instructor Notes:</th>
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<tbody>
<tr>
<td>I. Students define terminology related to color theory (slides #5-11)</td>
<td>Use a computer and projector to display part one (slides 1-18) of the presentation: Color Theory.</td>
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<tr>
<td>II. Students identify types of color schemes (slides #12-18)</td>
<td>Use the speaker notes in the presentation to aid with the content of the slides.</td>
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<td></td>
<td>Hand out the Color Theory Notes Organizer—1 per student—to aid them in note taking during your presentation.</td>
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<td>III.</td>
<td>Students will develop a color scheme</td>
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<tr>
<td>Activity #1: (Also listed in guided practice below) Students will obtain a color wheel; then they will use their notes organizer to choose colors from the color wheel that represent analogous, split-compliment, triad, harmonious pair, and tetrad color schemes; then they will color a given graphic according to those schemes.</td>
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<tr>
<td>Provide the students with a version of a color wheel (printed or electronic) and cutouts of a rectangle, square, equilateral triangle, and an isosceles triangle (to help them locate colors for a scheme).</td>
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<td>Find color wheel images on the internet.</td>
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<td>Hand out the Activity #1 Color Scheme sheet—1 per student—and review the instructions with the students.</td>
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<tr>
<th>IV.</th>
<th>Students identify RGB values for drawing objects</th>
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<tr>
<td>Use a computer and projector to display part two (slides 19-24) of the presentation: Color Theory.</td>
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<td>Have the students continue completing the Note Organizer given out previously.</td>
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<th>V.</th>
<th>Students design a color wheel using RGB values</th>
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<tr>
<td>Activity #2: (Also listed in guided practice below) Students will use their software of choice to draw shapes; then they will fill the shapes with color by setting RGB values to create a color wheel.</td>
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<td>Demo how to draw shapes, rotate and move objects, and fill with color using RGB values.</td>
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<td>Hand out the Activity #2 instruction sheet—1 per student—and review the instructions.</td>
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<th>VI.</th>
<th>Students establish CYMK values for drawing objects</th>
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<tr>
<td>Activity #3: (Also listed in independent practice below) Students will use software to draw shapes and fill</td>
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<td>Use a computer and projector to display part three (slides 25-31) of the presentation: Color Theory.</td>
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<td>Have the students continue completing the Note Organizer given out previously. Note: Prior to beginning this activity, obtain paint chip</td>
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<tr>
<td>Activity</td>
<td>Description</td>
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<td>Guided Practice (LSI Quadrant III):</td>
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<tr>
<td>Activity #1:</td>
<td>Students will obtain a color wheel; then they will use their notes organizer to choose colors from the color wheel that represent analogous, split-compliment, triad, harmonious pair and tetrad color schemes; then they will color a given graphic according to those schemes.</td>
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<td>Activity #2:</td>
<td>Students will use their software of choice to draw shapes; then they will fill the shapes with color by setting RGB values to create a color wheel.</td>
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<td>Independent Practice (LSI Quadrant III):</td>
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<td>Activity #3:</td>
<td>Students receive a paint chip sample with 3-4 paint colors on it, and they will use software to create drawing shapes filled with color that match the paint samples. Students will record both RGB values and CYMK values for each of the colors. They will print the document and staple the paint sample to it.</td>
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**Summary**

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<tr>
<th>MI</th>
<th>Review (LSI Quadrants I and IV):</th>
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<td>Have students in pairs ask questions of each other from the lesson note organizers they filled out at the beginning of the lesson.</td>
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### Evaluation

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<tr>
<th>MI</th>
<th>Informal Assessment (LSI Quadrant III):</th>
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<tr>
<td></td>
<td>• Discussion comments during introduction activity</td>
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<td>• Observation of note-taking during lesson presentation</td>
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<td>• Guided practice activities</td>
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<tr>
<th>MI</th>
<th>Formal Assessment (LSI Quadrant III, IV):</th>
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<td></td>
<td>• <strong>Activity #3</strong>: Students set CYMK values and compare to RGB values of same color</td>
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<td>• <strong>EXAM</strong>: Questions over Color Theory</td>
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### Extension

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<tr>
<th>MI</th>
<th>Extension/Enrichment (LSI Quadrant IV):</th>
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<td>• <strong>Enrichment #1</strong>: Have the students create a continuum of color from a tint to a shade using water colors, colored pencils, or drawing objects in an electronic document.</td>
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<td>• <strong>Enrichment #2</strong>: Have the students create a color scheme using computer software while incorporating at least 4 different shapes. Student should list RGB or CYMK values for each color used in the scheme and write a justification/description of the type of color scheme it is.</td>
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<td>Icon</td>
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<td>Naturalist</td>
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<td><img src="image" alt="Icon" /></td>
<td>Existentialist</td>
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Color Theory
Notes Organizer

PART ONE: Color Terminology

1. **Color**: Color results when _________ is reflected off an object. As the light hits an object, some of the light wave is _________ into the object. A portion of the light wave is ___________ back to your eyes.

2. Color results depend on the _________ of the light wave that is reflected from the object.

3. **Primary colors**: _________, _________ and _________ . These are considered the _________ colors.

4. All other colors can be created by using a _________ of any of these three colors.

5. **Tints**: Created by adding _________ to a color. **Shades**: Created by adding _________.

6. **Shades**: Created by adding _________ to a color.

7. **Secondary colors**: _________, _________ , and _________ . Created by mixing _________ amount of _________ primary colors.

8. **Tertiary colors**: These colors can be created by mixing a _________ color with an adjacent _________ color. OR they can be made by mixing _________ amounts of two _________ colors.

9. **Neutral colors**: _________, _________ , _________.

10. **Color Wheel**: If we arrange the _________, _________ and _________ colors in a circle, next to the colors that are mixed _________ we get a color wheel.
Color Schemes

11. **Complementary colors**: Any two colors that are exactly ______________ on the color wheel.

12. **Split-complement colors**: Have ____________ colors. Pick a color; find the two ____________ colors of its complementary color.

13. **Harmonious Pairs**: Have ____________ colors that are __________________ of each other.

Find a complementary pair - locate the two adjacent colors for the original pair.

14. **Analogous colors**: Any ____________ colors that are ____________ on the color wheel.

15. **Triad colors**: Have ____________ colors that are equally ____________ from each other on the color wheel. Most basic triad color scheme is the 3 ____________ colors.

16. **Tetrad colors**: Have _______ colors that are ______________ of each other on the color wheel.

**PART TWO: Electronic Color & RGB values**

17. Computer Monitors use light in __________ to create images on the screen. Monitors use __________, __________, and __________ color. This is called __________.

18. **Setting RGB values**: Click on the __________ button > Choose the __________ option > Click on the Custom tab.

19. **Setting RGB values**: A color is defined by three values of Red, Green, and Blue and must be within the number range of __________.

20. Equal values of Red and Green create __________.

21. **Setting RGB Values**: When all RGB values are 0, it creates __________.

22. When all values are __________, it creates __________.
PART THREE: Printed Color & CMYK values

23. **Color Printers**: Use mixtures of __________. Printers use __________, __________, __________, and __________ color. This is called __________.

24. The monitor screen displays color in __________; the printer will print that color in __________. Sometimes, the translation causes the color on a printout to be different from that on the screen.

25. **Setting CMYK values**: In some programs, you can switch the ________________ from RGB to CMYK.

26. **Setting CMYK values**: A color is defined by four values within the number range of __________.
Color Theory
Notes Organizer KEY

PART ONE: Color Terminology
1. **Color**: Color results when light is reflected off an object. As the light hits an object, some of the light wave is absorbed into the object. A portion of the light wave is reflected back to your eyes.
2. Color results depend on the **LENGTH** of the light wave that is reflected from the object.
3. **Primary colors**: Red, Yellow and Blue. These are considered the basic colors.
4. All other colors can be created by using a **mixture** of any of these three colors.
5. **Tints**: Created by adding white to a color
6. **Shades**: Created by adding black to a color
7. **Secondary colors**: Orange, Green and Violet. Created by mixing equal amount of two primary colors.
8. **Tertiary colors**: These colors can be created by mixing a primary color with an adjacent secondary color. OR they can be made by mixing unequal amounts of two primary colors.
10. **Color Wheel**: If we arrange the primary, secondary and tertiary colors in a circle, adjacent to the colors according to their mixture combinations we get a color wheel.

Color Schemes
11. **Complementary colors**: Any two colors that are exactly opposite on the color wheel.
12. **Split-complement colors**: Have three colors. Pick a color; find the two adjacent colors of its complementary color.
13. **Harmonious Pairs**: Have four colors that are split-complements of each other. Find a complementary pair; locate the two adjacent colors for the original pair.
14. **Analogous colors**: Any three colors that are side by side on the color wheel.
15. **Triad colors**: Have three colors that are equally distant from each other on the color wheel. Most basic triad color scheme is the 3 primary colors.
16. **Tetrad colors**: Have four colors that are equally distant from each other on the color wheel.

PART TWO: Electronic Color & RGB values
17. Computer Monitors use light in **3 colors** to create images on the screen. Monitors use RED, GREEN, and BLUE color. This is called RGB.
18. **Setting RGB values**: Click on the **Shape Fill** button > Choose the More Fill **Colors** option > Click on the **Custom tab**.
19. **Setting RGB values**: A color is defined by three values of Red, Green, and Blue and must be within the number range of 0-255.

20. Equal values of Red and Green create **Yellow**.

21. **Setting RGB values**: When all RGB values are 0 it creates **black**.

22. When all values are 255 it creates **white**.

**PART THREE: Printed Color & CMYK values**

23. **Color Printers**: Use mixtures of 4 colors. Printers use **CYAN, YELLOW, MAGENTA** and **BLACK** color. This is called **CMYK**.

24. The monitor screen displays color in **RGB values**, the printer will print that color in **CMYK values**. Sometimes, the translation causes the color on a printout to be different than that on the screen.

25. **Setting CMYK values**: In some programs, you can switch the **color mode** from RGB to CMYK.

26. **Setting CMYK values**: A color is defined by four values that must be within the number range of 0-100.
Color Theory
Activity #1: Color Schemes

Student Name: ________________________  Date: ________________

Instructions: Using a color wheel, select colors that represent the listed color scheme. Using map/color pencils, color in the objects to represent the chosen color scheme.

Scheme #1: Triad Scheme

Scheme #2: Split-Complement Scheme
Scheme #3: Harmonious Pair Scheme

Scheme #4: Tetradic Scheme
Scheme #5: Analogous Scheme

Record the #_____ of your favorite scheme.

Record the Name/Type ___________________ of your favorite scheme.

Explain what it is about your favorite scheme that makes you like it more than the others.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Activity #2: Using RGB Values to create a color wheel

1. Using a computer software program of your choice, create a document size 8.5" x 11".
2. Save this document to your student folder as My Color Wheel.
3. Add a text object with your first and last name.
4. Draw a circle 5" x 5" and center it on the document.
5. Draw an equilateral triangle (all sides of equal length) and center it inside the circle so that the tips of the triangle are resting on the edge of the circle.
6. Choose a drawing object such as a circle, trapezoid, arc, or wedge.
7. Draw the object and fill the shape with a RED color having an RGB value of 255, 0, 0.
8. Position this object at the intersection of the circle edge and triangle tip.
9. Repeat the previous step, filling the shape with a BLUE color.
10. Repeat again, filling the shape with a YELLOW color.
   * See image at right for a reference.
11. Continue in this same manner to draw the same object or copy and paste the same object around the edge of the circle.
12. You will need 9 objects positioned between each of the primary colored objects.
   * It’s ok if the objects slightly overlap each other.
13. Change the fill color of the objects using RGB values to determine the color.
14. Set the color to gradually change from one primary color to the next.
15. Be sure to properly represent the 3 secondary colors of Orange, Green, and Violet.
16. When you are finished, select all the objects and remove the outline color.
17. Save your changes and close the document.
Color Theory
Instructions for Activity #3 – Paint Chips

Student Name ______________________ Date ______________________

Activity #3: Using RGB Values and CMYK values to recreate pigment color
1. Use the paint chip sample your instructor provides you.
2. Using a computer software program of your choice, create a document size 8.5” x 11”.
3. Set the color mode to CMYK.
4. Save this document to your student folder as My Paint Chip Sample.
5. Add a text object with your first and last name.
6. Draw shapes/objects that are similar to the shapes of the paint samples.
7. Fill the objects with color that are as close as possible to the paint chip sample.
8. Create text objects to label the drawing objects with their CMYK values.
9. Change the color mode to RGB.
10. Create text objects to label the drawing objects with their RGB values.
* See image at right for a reference.
11. Save your changes.
12. Print your document.
13. Staple the paint sample to the printout.

Example:
Color Theory TEST

Instructions: Read each question below. Decide which option best answers the question and write the letter that precedes that answer in the blank to the left of question.

_______ 1. Tertiary colors are created by
   A. Mixing equal amounts of two primary colors
   B. Mixing unequal amounts of two primary colors
   C. Mixing equal amount of two secondary colors
   D. Mixing three primary colors

_______ 2. Complementary colors are
   A. Three colors side-by-side on the color wheel
   B. Created by adding white or black to a primary color
   C. Two colors opposite each other on the color wheel
   D. Cyan, Yellow, Magenta, and Black

_______ 3. CMYK stands for
   A. Cyan, Magenta, Yellow, and Black
   B. Cedar, Margarine, Yellow, and Krystaline
   C. Can't Mind Your Krazy rules
   D. Cedar, Mustard, Yellow, and Black

_______ 4. The secondary colors are
   A. Orange, Green, and Violet
   B. Red, Green, and Blue
   C. Orange, Yellow, and Violet
   D. Red, Yellow, and Blue

_______ 5. A triad color scheme is formed using
   A. Three colors side-by-side on the color wheel
   B. 2 colors that are equally distant from each other on the color wheel
   C. 4 colors that are equally distant from each other on the color wheel
   D. 3 colors that are equally distant from each other on the color wheel
6. Using RGB values, how is yellow created?
   A. Red: 255  Green: 255  Blue: 255
   B. Red: 0   Green: 255  Blue: 255
   C. Red: 255  Green: 0   Blue: 255
   D. Red: 255  Green: 255  Blue: 0

7. CMYK value ranges can be between what two numbers?
   A. 0 - 255
   B. 0 - 100
   C. 100 - 255
   D. 100 - 300

8. Using RGB values, how is black created?
   A. Red: 0   Green: 0   Blue: 0
   B. Red: 100 Green: 100 Blue: 100
   C. Red: 300 Green: 300 Blue: 300
   D. Red: 255 Green: 255 Blue: 255

9. The primary colors are
   A. Cyan, Magenta, Yellow, and Black
   B. Blue, Red, and Green
   C. Cyan, Magenta, and Yellow
   D. Blue, Red, and Yellow

10. Neutral colors are
    A. Red, Green, and Blue
    B. Red, Yellow, and Blue
    C. White, Black, and Brown
    D. Created by adding white or black to a color
Instructions: Read each question below. Decide which option best answers the question and write the letter that precedes that answer in the blank to the left of question.

B 1. Tertiary colors are created by
   A. Mixing equal amounts of two primary colors
   B. Mixing unequal amounts of two primary colors
   C. Mixing equal amount of two secondary colors
   D. Mixing three primary colors

C 2. Complementary colors are
   A. Three colors side-by-side on the color wheel
   B. Created by adding white or black to a primary color
   C. Two colors opposite each other on the color wheel
   D. Cyan, Yellow, Magenta and Black

A 3. CMYK stands for
   A. Cyan, Magenta, Yellow, and Black
   B. Cedar, Margarine, Yellow, and Krystaline
   C. Can't Mind Your Krazy rules
   D. Cedar, Mustard, Yellow, and Black

A 4. The secondary colors are
   A. Orange, Green, and Violet
   B. Red, Green, and Blue
   C. Orange, Yellow, and Violet
   D. Red, Yellow, and Blue

D 5. A triad color scheme is formed using
   A. Three colors side-by-side on the color wheel
   B. 2 colors that are equally distant from each other on the color wheel
   C. 4 colors that are equally distant from each other on the color wheel
   D. 3 colors that are equally distant from each other on the color wheel
6. Using RGB values, how is yellow created?
   A. Red: 255  Green: 255  Blue: 255
   B. Red: 0    Green: 255  Blue: 255
   C. Red: 255  Green: 0   Blue: 255
   D. Red: 255  Green: 255  Blue: 0

   B  7. CMYK value ranges can be between what two numbers?
   A. 0 - 255  
   B. 0 - 100 
   C. 100 - 255
   D. 100 - 300

   A  8. Using RGB values, how is black created?
   A. Red: 0    Green: 0   Blue: 0
   B. Red: 100  Green: 100  Blue: 100
   C. Red: 300  Green: 300  Blue: 300
   D. Red: 255  Green: 255  Blue: 255

   D  9. The primary colors are
   A. Cyan, Magenta, Yellow, and Black
   B. Blue, Red and Green
   C. Cyan, Magenta, and Yellow
   D. Blue, Red and Yellow

   C  10. Neutral colors are
   A. Red, Green, and Blue
   B. Red, Yellow and Blue
   C. White, Black and Brown
   D. Created by adding white or black to a color