Name _____

# Chapter 21 Color Additive Process Practice Worksheet

The way that color appears on a piece of paper and how your eyes interpret color involve two different color mixing processes. Your eyes see color using an additive color process. The RGB color model is the basis for how the additive process works and involves mixing colors of light. The CMYK color model is the basis for how the subtractive color process works and involves pigments of color which absorb colors of light.

| RGB color model | | | | CMYK color model | | |
|---|---|---|---|---|---|---|
| Primary colors | Mixed colors | New color | | Primary colors | Mixed colors | New color |
| red | red + green | yellow | | magenta | magenta + yellow | red |
| green | green + blue | cyan | | yellow | yellow + cyan | green |
| blue | blue + red | magenta | | cyan | cyan + magenta | blue |
| | | | | | | |
| How black is made | Absence of light | | | How black is made | Pure black pigment | |
| How white is made | red + green + blue | | | How white is made | Absence of pigment or use of pure white pigment | |

1. The human eye has photoreceptors for red, green and blue light. Which of these photoreceptors are stimulated when looking at white paint?

2. Which color process do human eyes use?

3. How would you see the following combinations of light colors?

    a. red only

    b. blue + red, both at equal intensity

    c. green only

    d. green + blue, both at equal intensity

4. The color orange is perceived by the eyes when both the red and green photoreceptors are stimulated and the red signal is stronger than the green. Given this information, what kind of signals would be received by the eye for the color purple?

5. White paint purchased at a store is often made of a pure whit pigment called titanium dioxide. This white paint reflects about 97% of the light that strikes it. Why might this property of the pain mean that you interpret its color as white?

6. You see a chair that is painted yellow. Most likely, pure yellow pigment was used to make the paint. However, explain how your eyes interpret the color yellow.

7. The image you see on a color TV screen is made using the _____ color model. The image is made of thousands of pixels or dots of color. Describe how you could make the following pixels using the RGB color model.

    a. A white pixel

    b. A black pixel

    c. A cyan pixel

    d. A yellow pixel

8. What colors of light are reflected and/or absorbed by a red apple when:

    a. White light shines on it?

    b. Only red light shines on it?

    c. Only blue light shines on it?