Painting with CMY

Go To: <https://www.physicsclassroom.com/shwave/paints.html>

**Overview:**

It's your time to order uniforms for the school's football teams. There is one difficulty: the company which you will order from prefers to receive the order in terms of the three primary colors of paints which will be applied to different parts of the uniform. In this activity, you will experiment with the effect of different paint colors on the appearance of the various parts of a football team uniform.

**Directions:**

Circle the primary paint colors which must be imparted to the following team uniforms in order to create the indicated color appearance:

**Team #1: Chicago Titans**

|  |  |  |
| --- | --- | --- |
| **Uniform Part** | **Desired Appearance** | **Required Paint Colors** |
| Helmet | Blue | Cyan     Magneta      Yellow |
| Skin | Magenta | Cyan     Magneta      Yellow |
| Shirt | Yellow | Cyan     Magneta      Yellow |
| Pants | Blue | Cyan     Magneta      Yellow |
| Socks | White | Cyan     Magneta      Yellow |
| Shoes | Black | Cyan     Magneta      Yellow |

**Team #2: Washington Knights**

|  |  |  |
| --- | --- | --- |
| **Uniform Part** | **Desired Appearance** | **Required Paint Colors** |
| Helmet | Red | Cyan     Magneta      Yellow |
| Skin | Black | Cyan     Magneta      Yellow |
| Shirt | Blue | Cyan     Magneta      Yellow |
| Pants | White | Cyan     Magneta      Yellow |
| Socks | Red | Cyan     Magneta      Yellow |
| Shoes | Yellow | Cyan     Magneta      Yellow |

**Team #3: St. Louis Fliers**

|  |  |  |
| --- | --- | --- |
| **Uniform Part** | **Desired Appearance** | **Required Paint Colors** |
| Helmet | Green | Cyan     Magneta      Yellow |
| Skin | Yellow | Cyan     Magneta      Yellow |
| Shirt | Green | Cyan     Magneta      Yellow |
| Pants | Yellow | Cyan     Magneta      Yellow |
| Socks | White | Cyan     Magneta      Yellow |
| Shoes | Black | Cyan     Magneta      Yellow |

**Follow-Up Questions:**

1. Indicate the result of mixing the following primary color of paints in equal amounts:

Cyan + Magenta ---->  
  
Cyan + Yellow ---->  
  
Magenta + Yellow ---->  
  
Cyan + Magenta + Yellow ---->

2. What primary paint colors must be imparted to an object to give it the appearance of white?

3. What primary paint colors must be imparted to an object to give it the appearance of black?

4. A primary paint color serves to selectively absorb a specific primary color of light. Whatever light is not absorbed is reflected by that paint. Use your understanding of color addition and subtraction to indicate which primary colors of light are absorbed by each primary paint.

Cyan paint absorbs the primary light color \_\_\_\_\_.  
  
Magenta paint absorbs the primary light color \_\_\_\_\_.  
  
Yellow paint absorbs the primary light color \_\_\_\_\_.

5. Complete the color equations shown below; then indicate what primary paint color(s) are in the object.

1. R + G + B light - \_\_\_\_\_\_\_\_\_\_\_\_ light = R + G light = \_\_\_\_\_\_\_\_\_\_\_ appearance; there is \_\_\_\_\_\_\_\_\_\_\_ paint in the object.
2. R + G + B light - \_\_\_\_\_\_\_\_\_\_\_\_ light = R light = \_\_\_\_\_\_\_\_\_\_\_ appearance; there is \_\_\_\_\_\_\_\_\_\_\_ paint in the object.
3. R + G + B light - \_\_\_\_\_\_\_\_\_\_\_\_ light = G + B light = \_\_\_\_\_\_\_\_\_\_\_ appearance; there is \_\_\_\_\_\_\_\_\_\_\_ paint in the object.
4. R + G + B light - \_\_\_\_\_\_\_\_\_\_\_\_ light = \_\_\_\_\_\_\_\_\_\_ light = Magenta appearance; there is \_\_\_\_\_\_\_\_\_\_\_ paint in the object.
5. R + G + B light - \_\_\_\_\_\_\_\_\_\_\_\_ light = \_\_\_\_\_\_\_\_\_\_ light = Black appearance; there is \_\_\_\_\_\_\_\_\_\_\_ paint in the object.
6. R + G + B light - \_\_\_\_\_\_\_\_\_\_\_\_ light = G light = \_\_\_\_\_\_\_\_\_\_\_ appearance; there is \_\_\_\_\_\_\_\_\_\_\_ paint in the object.