Reflection, Transmission and Color

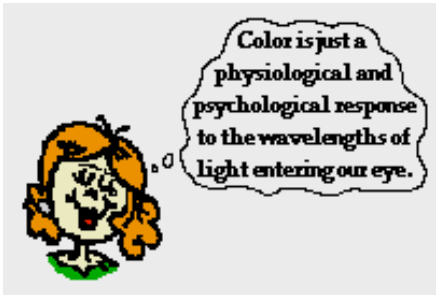
Read from **Lesson 2** of the **Light Waves and Color** chapter at **The Physics Classroom:**

http://www.physicsclassroom.com/Class/light/u12l2a.html
http://www.physicsclassroom.com/Class/light/u12l2b.html
http://www.physicsclassroom.com/Class/light/u12l2c.html

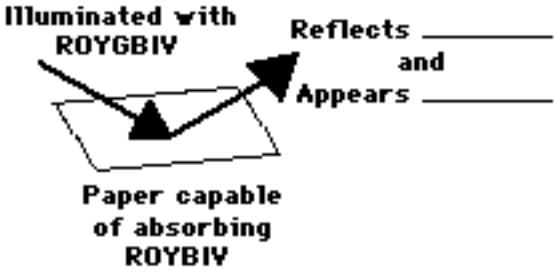
1. Visible light is composed of a range of wavelengths; different wavelengths correspond to different colors. Identify the seven component colors of visible light.

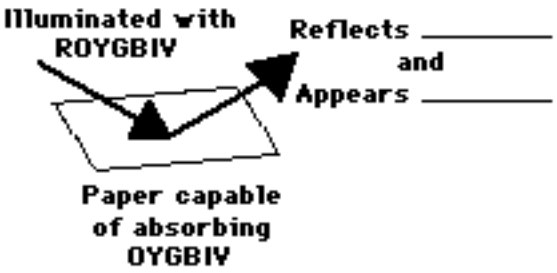
   _____ _____ _____ _____ _____ _____ _____

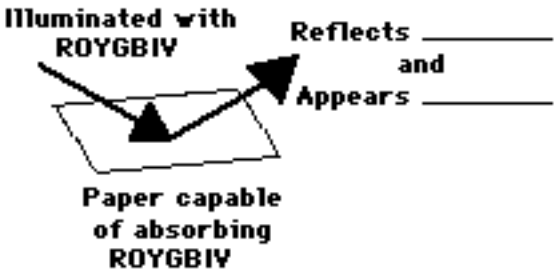
2. Natural philosophers have long pondered the underlying reasons for color in nature. One common historical belief was that colored objects in nature produce small particles (perhaps light particles) that subsequently reach our eyes. Different objects produce different colored particles, thus contributing to their different appearance. Is this belief accurate or not? _____ Justify your answer.

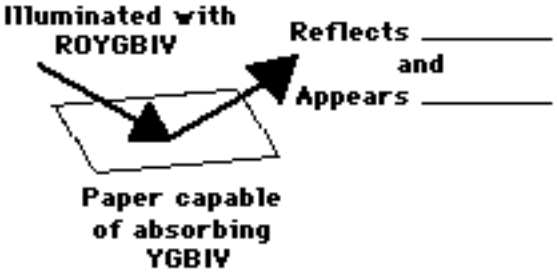


3. The color that an opaque object appears is dependent upon what color(s) of light incident upon the object and the color(s) of light reflected by the object. Express your understanding of this principle by filling in the blanks in the following diagrams.





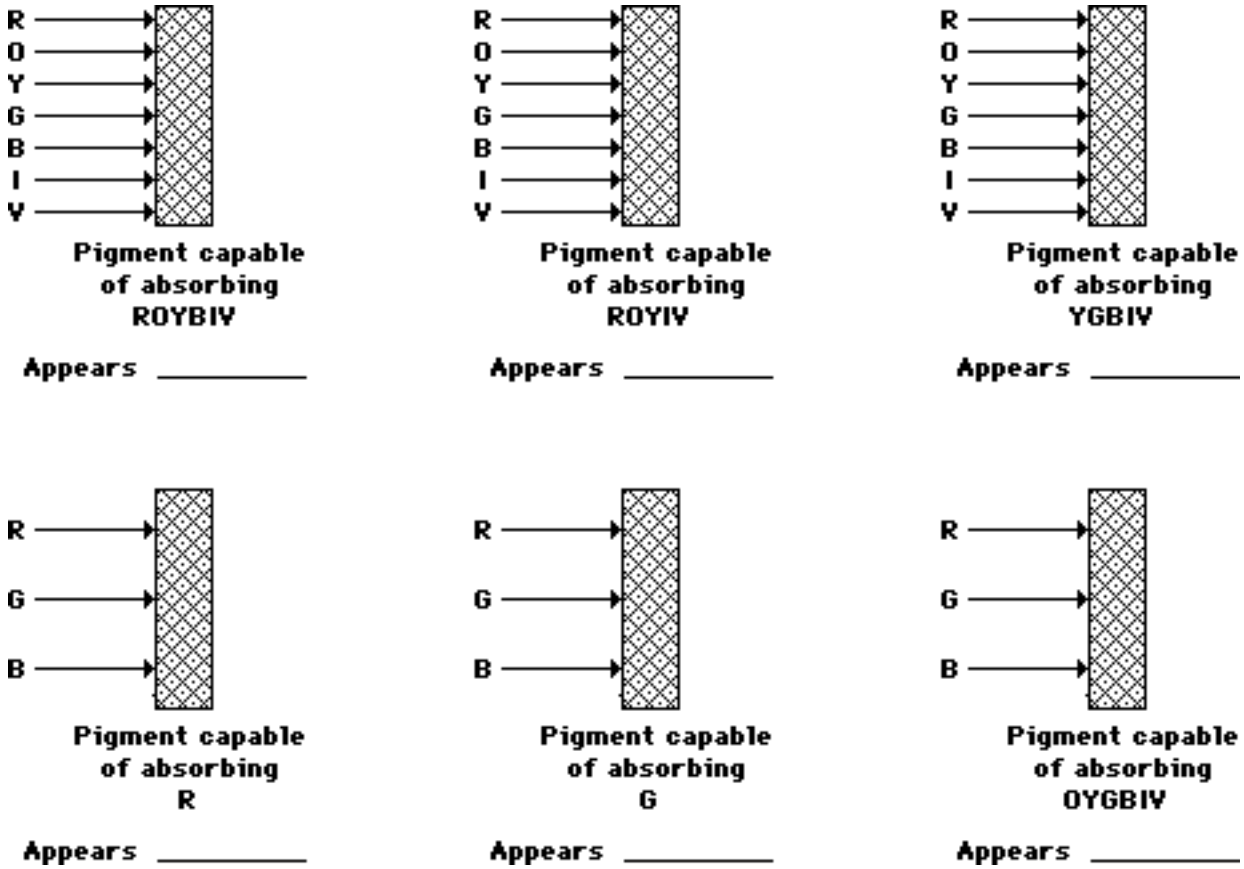




4. Two students in the cafeteria are discussing the physics of color. The students are claiming that white and black are not really colors of light. If white and black are not really colors of light, then what are they? Explain fully.

5. Explain why a red shirt looks red when visible light ("ROYGBIV") shines upon it.

6. Transparent materials are materials that allow one or more of the colors of visible light to be transmitted through them; whatever color(s) is/are not transmitted by such objects, are typically absorbed by them. The appearance of a transparent object is dependent upon what color(s) of light is/are incident upon the object and what color(s) of light is/are transmitted through the object. Express your understanding of this principle by continuing the arrow(s) for any transmitted color(s) and filling in the blanks in the following diagrams.



7. What color(s) of visible light will a cyan (bluish-green) pair of sunglasses ...
   a. ... transmit?

   b. ... absorb or block?