

# *Light, the Universe, and Everything*

## **Color mixing on the computer screen**

We will use a program written by Bill Kaiser in the psychology department that allows us to mix  $64^3$  different colors on a color monitor.

[Note: If there is only one computer available, it is very important that everyone gets to see, especially with the magnifying glass. If you find yourself walking away unsatisfied, you can do the mixing exercise on any networked PC (not Mac) by following the instructions in the appendix.]

### **Using the program.**

- Open “COLORS.EXE” by double clicking on it, or the shortcut on the screen. The numbers at the bottom represent the intensities of the red, the blue, and the green circles.
- Type “r”, “b”, or “g” to reduce the intensity of the red, blue, and green, respectively (to a minimum of 0).
- Type “R”, “B”, or “G” to increase the intensity of the red, blue, and green, respectively (to a maximum of 63).
- “Enter” exits the program (sorry about that).

### **Basic color mixing.**

Set all three (R, G, B) at their maximum intensity, and see whether the rules for color mixing on the computer screen match the algebraic rules you have just codified with the projectors and filters.

### **Advanced color mixing.**

By varying the settings, try to see how the red, green, blue, cyan, magenta, and yellow relate to each other. Suggestions:

- Make some neutral grays. How does this compare to Newton’s statement that “Whiteness and all grey Colours between white and black, may be compounded of Colours, and the whiteness of the Sun’s light is compounded of the primary Colours mix’d in due Proportion”?
- Make some pastels. What characterizes these colors?
- Make orange (hint: adjust the relative amounts of green and red). How does this compare to what we saw when we placed an orange object in various parts of the spectrum in the Newton lab?
- Test the idea that brown is a dim orange.
- Try to match the color of some non-spectrally colored item in the classroom, such as a piece of faded clothing.

### **How'd they do that?**

Examine the screen close up with a hand lens or magnifying glass. What do you see? If your socks haven't been knocked off, you haven't looked closely enough!

- ✓ Make sure you understand whether this is additive or subtractive color mixing, and why.

## **GETTING INTO "COLORS" ON ANY NETWORKED IBM-TYPE COMPUTER**

### **First, map a network drive.**

Right click on "My Computer"

Choose "Map network Drive"

Type the path:

[\\www\courses%yourid](http://www.courses%yourid)

Enter your email password when asked

Do not check "reconnect at logon"

### **Get into the drive you just mapped.**

"My Computer"

"Courses%yourid on 'Www' (F or G or H, etc:)

kdorfman

colors

colors.exe