

Taking Away From RGB Lab

Teacher's Guide

Topic:

Light and Color

The following information is provided to the student:

Question:

What is the result of mixing primary pigment colors and what strategy could be used for predicting such results?

Purpose:

To observe the result of mixing primary pigment colors and to summarize the results using seven color subtraction principles.

A complete lab write-up includes a Title, a Purpose, a Data section, a Conclusion/Discussion. The Data section should include labeled color diagrams with actual colored markers being used to add the primary pigments. The Conclusion/Discussion should describe the seven possibilities and explain what each pigment or combination of pigments subtracts from RGB light.

Materials Required:

Cyan, magenta and yellow highlighters; white paper.

Description of Procedure:

Each student acquires three highlighter colors. In the Data section of their lab notebook, they draw circles of the various highlighter colors. They place the individual colors on the paper by themselves; they mix two of the colors together in other locations; and in one location, they mix all three colors together. They identify the resulting appearance in each case. Finally, students use the principles of color subtraction to explain in their Conclusion/Discussion how the observed color results when white light (RGB light) is incident on the paper at each of the seven locations.

Alternative Materials and Procedure:

Color filters or gels in the colors of cyan, magenta and yellow could be used in place of highlighters. The color of light which passes through the filter is observed. Students ponder the interaction of the primary colors of light with the pigments in the filter.

Safety Concern:

There is always a higher than usual level of risk associated with working in a science lab. Teachers should be aware of this and take the necessary precautions to insure that the working environment is as safe as possible. Student *horseplay* and off-task behaviors should not be tolerated.

Suggestions, Precautions, Notes:

1. Before buying a class set of highlighters, experiment with the brand to insure that it produces satisfactory results. Bic brand highlighters have been found to work with satisfactory results.

The Laboratory

Auxiliary Materials:

None

Scoring Rubric:

L7. Taking Away from RGB Lab	Score
____ Included, labeled and organized all parts of the lab report. ____ Data section includes labeled color diagrams in which colored markers were mixed on various locations of the page. Colors being mixed were labeled; results are clearly documented. ____ Conclusion/Discussion describes the seven different results (R, G, B, C, Y, M, Black) and explains the results in terms of the subtraction of primary light colors from the original RGB incident light. Explanations are accurate and thorough.	____/____

Connections to The Physics Classroom Tutorial:

The following readings are a suitable accompaniment to this lab:

<http://www.physicsclassroom.com/Class/light/u12l2c.cfm>

<http://www.physicsclassroom.com/Class/light/u12l2e.cfm>

Connections to Minds on Physics Internet Modules:

Sublevel 4 of the Light and Color module is a suitable accompaniment to this lab:

<http://www.physicsclassroom.com/mop/module.cfm>