Painting with CMY 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 predict the primary pigment colors required to produce a given color appearance and to describe a successful strategy for making such a prediction.

A complete lab write-up includes a Title, a Purpose, a Data section, a Conclusion/Discussion. The Data section should include the completed table. The Conclusion/Discussion section should include a thorough discussion of a strategy used to predict how to decide which primary pigments must be mixed to produce a given appearance.

URL: http://www.physicsclassroom.com/shwave/paints.cfm

Materials Required:

A page from The Shockwave Physics Studios:
http://www.physicsclassroom.com/shwave/paints.cfm

Description of Procedure:

Students log on to the above page. They select the desired section of the player's uniform from the pull-down menu. They then click on the buttons to add cyan, magenta and yellow paints to the selected section of the uniform in order to produce the desired color. As a conclusion, students discuss the strategy which could be used to predict the primary pigment colors which would be required to produce a given appearance.

Alternative Materials and Procedure:

A more thorough approach to this lab is provided at The Shockwave Physics Studios:

http://www.physicsclassroom.com/shwave/paintdirns.cfm

The alternative exercise is a guided exercise with an extensive procedure.

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:

The Laboratory

1. The most unique part of the lab is the wording of the Purpose. Students must develop a strategy that would be capable of predicting which pigment colors would result in a specified color. Students are not asked to find the *answers*; they are asked to find the strategy.

Auxiliary Materials:

The following page is provided to the student for completion and inclusion in the Data section of their lab notebook.

Team #1: Chicago Titans

Uniform Part	Desired Color Appearance	Required Paint Colors		
Helmet	Blue	**C**	**M**	**Y**
Skin	Magenta	**C**	**M**	**Y**
Shirt	Yellow	**C**	**M**	**Y**
Pants	Blue	**C**	**M**	**Y**
Socks	White	**C**	**M**	**Y**
Shoes	Black	**C**	**M**	**Y**

Team #2: Washington Knights

Uniform Part	Desired Color Appearance	Required Paint Colors		
Helmet	Red	**C**	**M**	**Y**
Skin	Black	**C**	**M**	**Y**
Shirt	Blue	**C**	**M**	**Y**
Pants	White	**C**	**M**	**Y**
Socks	Red	**C**	**M**	**Y**
Shoes	Yellow	**C**	**M**	**Y**

Team #3: St. Louis Fliers

Uniform Part	Desired Color Appearance	Required Paint Colors		
Helmet	Green	**C**	**M**	**Y**
Skin	Yellow	**C**	**M**	**Y**
Shirt	Green	**C**	**M**	**Y**
Pants	Yellow	**C**	**M**	**Y**
Socks	White	**C**	**M**	**Y**
Shoes	Black	**C**	**M**	**Y**

Scoring Rubric:

L8.	**Painting with CMY Lab**	**Score**
____	Included, labeled and organized all parts of the lab report.	
____	Data section includes the provided table; answers are given and accurate.	
____	Conclusion/Discussion includes a thorough and accurate discussion of the strategy used to predict the result of mixing two or more primary pigments. Discussion centers around the strategy (not the answers). Discussion elaborates on the topic, is accurate, not vague nor ambiguous. Discussion reveals understanding.	____/____

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/u12l2d.cfm

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

Connections to Minds on Physics Internet Modules:

Sublevels 6 and 7 of the Light and Color module are suitable accompaniments to this lab:

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