

Fashion Lesson - Color Gradation

Introduction: Color gradation is determined by solving the quadratic equation. Thread count affects the pattern of color variation. This lesson illustrates the use of mathematics as it applies to achieving that color variance

Mathematics Objectives:

Solve and use proportions

Percentages.

Select and compute with appropriate standard or metric units to measure length, area.

Formulas

Materials Needed:

Purchase or procure: 1 yard of loosely woven fabric (multi-color). It is important that the fabric be a large or loose weave.

Note: this fabric should be a woven pattern and not a printed fabric

Gradated Lines Information Sheet (one per student)

Gradated Lines Worksheet (one per student)

Gradation Color (Thread Count & Color) Worksheet (one per 2 students)

Technology Resources:

URLs on Jacquard Looms

<http://www.maxmon.com/1800ad.htm>

<http://www.casalegno.it/Ing/Prodott/technique1.htm>

<http://babbage.mc.edu/~jrr/cs105/webdoc99/mkbhist.htm>

Time Needed:

3 Days

Getting Started:

Thread count is important for color and weight. A percentage of thread content is calculated in a similar fashion to determining the percentage of each thread color in a particular fabric. Customs evaluates the thread content to assess duty charges on imported fabrics.

Cut out 3-inch diameter circle "chunks" of fabric (one "chunk" per 2 students) from the sample purchased at a local fabric store.

Connections to:

Technology - Computer Programming

Other Industry - Computer Technology

Other Subject Areas:

Science - Chemistry is used in testing thread content for flammability, cleaning instructions, strength, fabric content, and more...

Social Studies - Geography - Some fabrics are more appropriate for warm climates vs. cold climates. Fabric patterns and use of color often reflect cultural influences.

Language Arts - The garment industry requires communication of fabric content, weight, and cleaning instructions on all products. Students may write these descriptions and prepare labels for their fabric designs. Descriptions of the fabric appearance and which garment products may be produced is another application of the information acquired in this lesson.

Art - Mathematics directs the patterns, but artists must translate the designs into forms pleasing to the garment to be constructed.

Problem Statement:

Lesson Activities

1. Have students bring pictures of gradated lines to class. (These may be from magazines, photos, or sample objects.) Discuss the coloration of the pattern and compare the gradation to the threads of different color.
2. Give students the **Gradated Lines Information Sheet**.
3. Discuss the patterns of Red and Gold colored threads and review the mathematics that supports the pattern.
4. Explain the quadratic equation and quadratic formula. For advanced students, factoring and other manipulation of the quadratic equation is reasonable. For younger or less advanced students teachers may elect to use calculators to solve the equation.
5. Complete the experiments and determine the thread patterns given on the **Gradated Line Worksheet**.
6. Use the overhead projector transparencies to overlay color onto various fabric pattern designs. Discuss the transformation from an artistic point of view and discuss the idea that mathematics and art are "married" in this process.

Assessment:

Class Discussion: Student participation will help identify student understanding of calculating percentages.

Paper/Pencil: The **Thread Count and Color Worksheet** may be graded as a homework assignment.

Hands-On Experiment: Students are evaluated by the accuracy of the measurements. Note: Comparisons of student measurements will provide enough information to determine if students are measuring thread lengths accurately.

Glossary

Gradation: in fabrics, this is the passing of one tint or shade of color to another, in very small degrees.

Customs: The United States Customs Service ensures that all imports and exports comply with U.S. laws and regulations. Many U.S. companies do business with industries overseas, and when foreign companies send goods back to the U.S., they must comply with U.S. laws, which are enforced by the Customs Service. The Customs Service will also assess and collect Customs duties, excise taxes, fees and penalties due on imported merchandise. To do this, The Customs Service evaluates thread count on imported fabrics and uses that figure as a basis for duties and taxes.