CANDY IS DANDY

Teacher Guide

SUMMARY

This lesson shows students the benefits of using graphs to communicate information, answer questions, and solve problems as they investigate color distribution in bags of M&M's. Working with actual bags of candy, students will sort and classify contents, summarize their findings on a worksheet, convert the numbers into charts, and make predictions about color distribution in other bags of candy.

OBJECTIVES

◆ To introduce students to the concept of graphing

◆ To record color distribution in spreadsheet format

◆ To utilize information obtained through hands-on research and analysis to write a research report

PREREQUISITE SKILLS

◆ Knows how to use *Microsoft® Word* to create a document including formatting and editing text

◆ Knows how to create a *Microsoft® Excel* worksheet including creating formulas

◆ Can create presentations using *Microsoft® Powerpoint®*

TIME ALLOTTED

Approximately 2-3 days

"Candy Is Dandy" worksheet created in *Microsoft Excel 97*

COLORS	BAG 1	BAG 2	BAG 3	BAG 4	AVERAGE
Blue	6	3	6	8	6
Brown	4	6	4	7	5
Green	3	2	6	5	4
Orange	7	7	4	4	6
Red	5	5	7	3	5
Yellow	4	6	3	5	5
TOTAL	29	29	30	32	30

HOW TO BEGIN

Introduce students to the concept of charting and discuss why some data collections are better represented by bar charts, while others may be easier to interpret as line charts or pie charts. Explain that while there are no sure-fire rules that state which chart type to select for a particular data set, it is important to select a chart type which gets a message across in the most effective way. Bar charts, for example, allow for a comparison of values within a category, line charts emphasize a progression of change, and pie charts show the relationship of a part to the whole.

Tell students that this lesson requires them to work with several bags of candy of differing weights. They will be sorting the contents of each bag by color, recording the number of candies for each color, and representing observations in both a worksheet table and several types of charts.

Extension Activities

◆ Students can use *Internet Explorer* to visit the M&M's Web page (http://www.m-ms.com/) and take a virtual tour of the factory. They can send electronic mail to the company, indicating which colors they like best and which colors they would like to see in future bags of candies.

◆ Encourage older students to summarize their research findings in a letter to the Consumer Affairs Department, M&M/Mars, Hackettstown, NJ 07840-1503. Students can use Microsoft Word's Letter Wizard to get started.

Student Activity

DESCRIPTION

You are going to conduct some market research about M&M's. First, you will sort and classify the contents of several bags of M&M's, summarize your findings on a worksheet created in Microsoft Excel, convert the numbers into charts, and make predictions about color distribution in other bags of candy.

Example 1: **Cell Notes pop-up from *Microsoft Excel***

STEP 1

Color Distribution

SOFTWARE: Microsoft Word

WHAT TO DO: Work in pairs using several small-size bags of M&M's, or two larger-sized bags. Before opening any bag of candy, take a guess about the colors you expect to find. Do bags of equal weight have an identical number of candies? Are all colors represented equally or are some more popular than others? Does color distribution remain constant no matter how small or large the bag? Record your answers in a *Word* document and save for later reference.

STEP 2

Creating a Worksheet

SOFTWARE: Microsoft Excel

WHAT TO DO: Open a worksheet in *Microsoft Excel*. In cell A1, type the title Candy Is Dandy! In row 3 beginning in cell A3, type the headings Colors, Bag 1, Bag 2, Bag 3, Bag 4 and Average. Type in the weight of the bags of M&M's in a com-

ment. Click in cell B3, choose Comment from the Insert menu, then type the weight in the yellow pop-up (see Example 1). Now, anytime you move your cursor over that cell, the weight will appear.

In column A, beginning in cell A4, list all of the colors of M&M's you found in your bags. Next, sort the list alphabetically by highlighting the cells and choosing Sort from the Data menu. Type Total in the cell below your last entry.

Now you can format your worksheet in a variety of ways. Choose AutoFormat from the Format menu and select the format of your choice!

STEP 3

Adding Formulas

SOFTWARE: Microsoft Excel

WHAT TO DO: Enter the number of same color M&M's in the corresponding cells beginning with Bag 1. Use the AutoSum function to total your columns. Highlight cells B10:E10. Choose Fill from the Edit menu, then choose Right.

Now, you can automatically calculate the average number of each color per bag. Click in cell F4, then type the formula **=average(B4:E4)**. Highlight cells F4:F10. Choose Fill from the Edit menu, the choose Down. Format cells in the Average column so that a whole number is returned (i.e. no decimal places) by using the Decrease Decimal button on the Formatting toolbar.

Interpret your data. Are some colors more numerous? Do all bags have the same number of candies? Compare your observations with the findings of students in other groups. Are the same colors more numerous from one group to another? Is color distribution consistent in bags of differing weights?

STEP 4

Creating Graphs

SOFTWARE: Microsoft Excel

WHAT TO DO: Use the Chart Wizard in *Microsoft Excel* to produce at least two different charts (see Example 2.). Choose the chart types that best represent

the data such as bar chart or column chart. You might chart the distribution of colors in a single bag, or the total number of candies for all bags in your sample.

Highlight cells **A3:E9**. Choose Chart from the Insert menu. Click the Column chart type, then click the Next button. Click the Data Range tab, and be sure Columns is selected next to Series In, then click Next. In step 3 of the Wizard (Chart Options), click the Titles tab. Add titles for the chart and its axes. Click the Gridlines tab and experiment with gridline options. Choose a gridline that makes it easier to understand the data. Click Legend tab and choose a locations for the legend, then click Next.

Finally, have *Microsoft Excel* place the chart as an object on the original worksheet, so that worksheet entries are visible as you examine the chart.
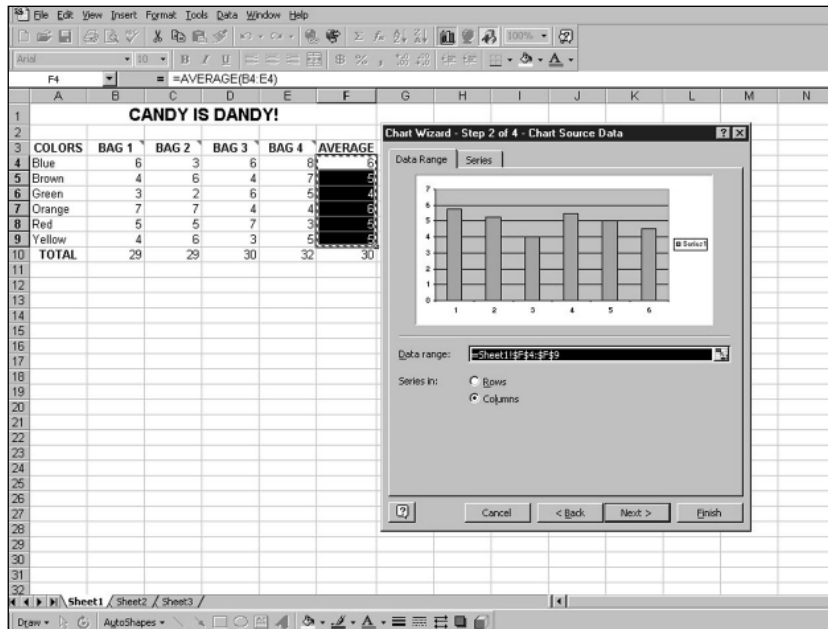

Example 2: **Column chart created from *Microsoft Excel* Chart Wizard**

STEP 5

Writing The Report

SOFTWARE: Microsoft Word

WHAT TO DO: Students can use *Word* to describe the research project, the procedures they employed to sort and count the candies, and what the data reveals about candy colors and color distribution.

Students should compare their initial hypotheses about the average number of candies per bag and the expected color distribution with actual survey results have them copy and paste spreadsheet and chart data into *Word* where appropriate (see Example 3.).

Reports should discuss the advantages/disadvantages of representing data in spread-sheet tables, column charts, bar graphs, or pie charts. When is it best to use one chart type instead of another? What is the value of using more than one bag of candy to conduct this experiment? ■
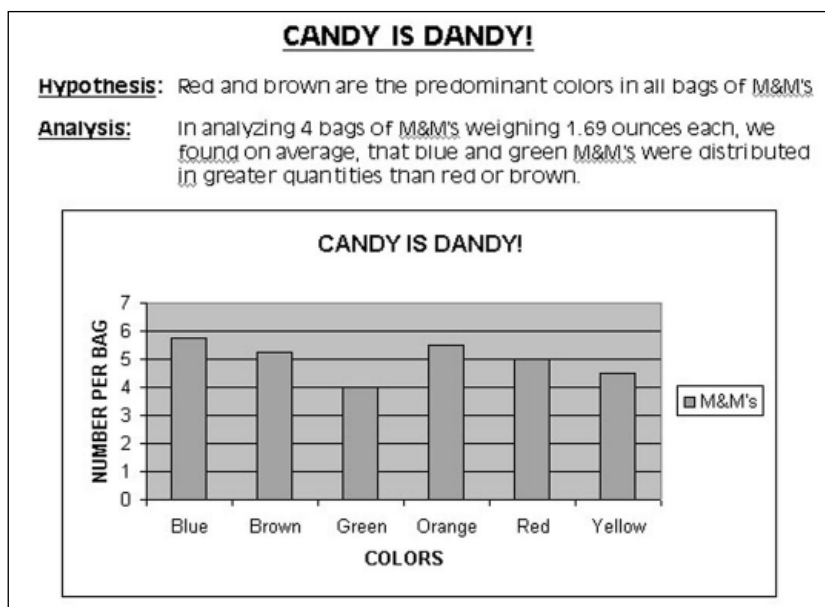
Example 3: **Report created in *Microsoft Word* with column chart imported from *Microsoft Excel***