

**Inside the School**

# **Graphs and Percentages Cumulative Activity**

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## **Special Report**

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# GRAPHS AND PERCENTAGES CUMULATIVE ACTIVITY

Students encounter graphs and percentages in other subjects and in daily life, but these two important topics are often under represented in math classes. In most lessons, the basics are covered first, and then students find a list of percentages, or create a line graph with a given set of data. Teachers present the information either very simplistically, in the hope that the student can translate the information correctly; or very complexly, in the hope that students will recognize the versatility of such a basic topic.

With the day-to-day availability of resources, an independent project is a great way to generate student interest and create meaningful connections in graphs and percentages. Learning to understand percentages and critically analyze graphs helps when every sale at the mall is a percentage of price and sports pages are full of graphs.

This project challenges the students to find four items to buy on a budget. The underlying theme of a budget is a nice fiscal responsibility reminder that students can't just buy whatever they want. It also challenges them to just find not just what is cheapest, but rather to try to hit a price goal. Students then apply two discounts, one "store-wide" discount and one from a coupon. Then they add tax to find out how much each item will cost. Students apply the discounts three ways to see if the final total changes. All of this information is gathered in a series of tables. The amount of data is not huge, but it is enough that representing it visually in a bar graph translates what is happening.

## SCORING

### **Car ad analysis:**

12 points: Analysis questions

9 points: definitions of the three types of graphs

### **Project**

8 points: pre-questions

51 points: project

32 points: Fill in the chart

19 points: Graph

2 points: Labeled axis

2 points: Labeled units (items and price amounts)

12 points: Accuracy of data. 3 points per item.

2 points: Added a key.

1 point: Neatness

### **Post Questions:**

20 points: post questions

A fun extension is to have the students cut out the different tables and graphs and to create a book or poster to hand in with their final analysis.

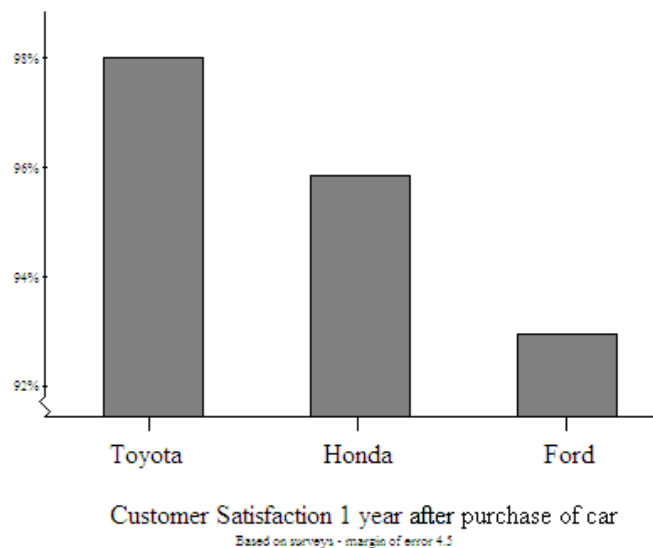
If you have any questions or comments, please contact me,  
Huckleberry Rahr, at:  
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## CAR AD ANALYSIS

### LET'S GO SHOPPING!

Information comes at us at lightening speed. Often, we receive more information than we can process efficiently, which leaves us as consumers open to advertising's persuasive techniques. Graphs organize information in an easy-to-process and dramatic way. Open any magazine and you will see bar, line and circle graphs. You see graphs all the time on billboards, magazine and TV ads, in books and on the Internet. They are everywhere. A graph's designers have an amazing power to show you what they want you to see. If you can't sort through the information for yourself, you can be easily persuaded to make poor buying choices.

Look at the following replica of an ad from a magazine:



1) What is the ad trying to show the consumer?

2) Does the ad work? Explain.

3) Looking at the bars, how many times more satisfied are the Toyota owners after one year?

4) Look more closely. What is the percentage of satisfaction for each brand of car?

5) Read the small print. What is the margin of error?

6) What is does the graph actually show?

**Definitions.** Look up a definition for the following types of graphs. Define them **IN YOUR OWN WORDS!** You can use a visual to help with your definition, but don't only use a visual.

Bar Graph –

Line Graph –

Circle Graph –

## PROJECT

### THE CHALLENGE:

You need a new outfit. You need to buy a new pair of pants, or other bottoms, a new top and a new pair of shoes. To top off your outfit, you need an accessory: a watch, a purse, a piece of jewelry, sunglasses or other accessory you feel will top off your outfit nicely. Unfortunately, you are on a budget and only have \$100 and must spend as close to that total as you can without going over.

Find ads for each item you are going to buy with the attached price. Make sure to keep a copy of the ad to turn in with your project. Find *original prices*, not discounts, because we are going to do the discounts ourselves. In our class, the bottoms are 10% off, the shirt is 15% off the shoes are 20% off and the accessory is 25% off. On top of that, you have a coupon for 10% off any purchase you buy. Don't forget sales tax. Every item you buy has a sales tax of 5.5%. If you buy online, we will assume that shipping is free.

You will find a table in this packet that will help you do all of your calculations. You will do all calculations twice: once with the coupon being calculated second, and once with it being calculated first. You will also fill in a table with the discounts taken together. **Make sure you bring the ads to class to turn in as part of the project.**

## PRE QUESTIONS

**Answer the following questions in complete sentences.** Don't worry about right answers or wrong answers; these questions are just to get you thinking. By the end of the project we should know the right answers. Please leave your conjectures here; you will not lose points for incorrect answers.

- 1) Where can you go to find your items?
  
- 2) Do you think it will be more cost effective to go to one shop or to many shops? Explain.
  
- 3) Do you think it is a better deal to get 15% off and then an additional 10% off or to get 10% off and then an additional 15% off? Explain.
  
- 4) Do you think it is a better deal to get 15% off and then an additional 10% off or to just get 25% off? Explain.



## FILL IN EACH CHART

### Discount before coupon:

Item	Discount taken	New price	Discount taken	New Price	Tax taken	New Price
Bottom	10%		10%		5.5%	
Top	15%		10%		5.5%	
Shoes	20%		10%		5.5%	
Accessory	25%		10%		5.5%	

### Coupon before discount:

Item	Discount taken	New price	Discount taken	New Price	Tax taken	New Price
Bottom	10%		10%		5.5%	
Top	10%		15%		5.5%	
Shoes	10%		20%		5.5%	
Accessory	10%		25%		5.5%	

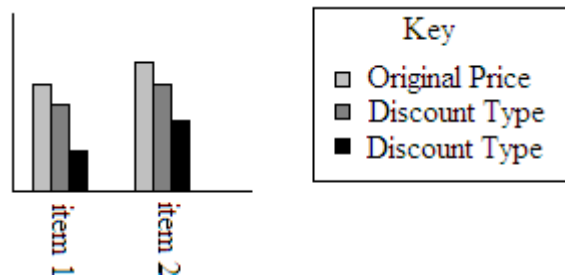
### Discount and coupon together:

Item	Discount taken	New price	Tax taken	New Price
Bottom	20%		5.5%	
Top	25%		5.5%	
Shoes	30%		5.5%	
Accessory	35%		5.5%	

## GRAPH

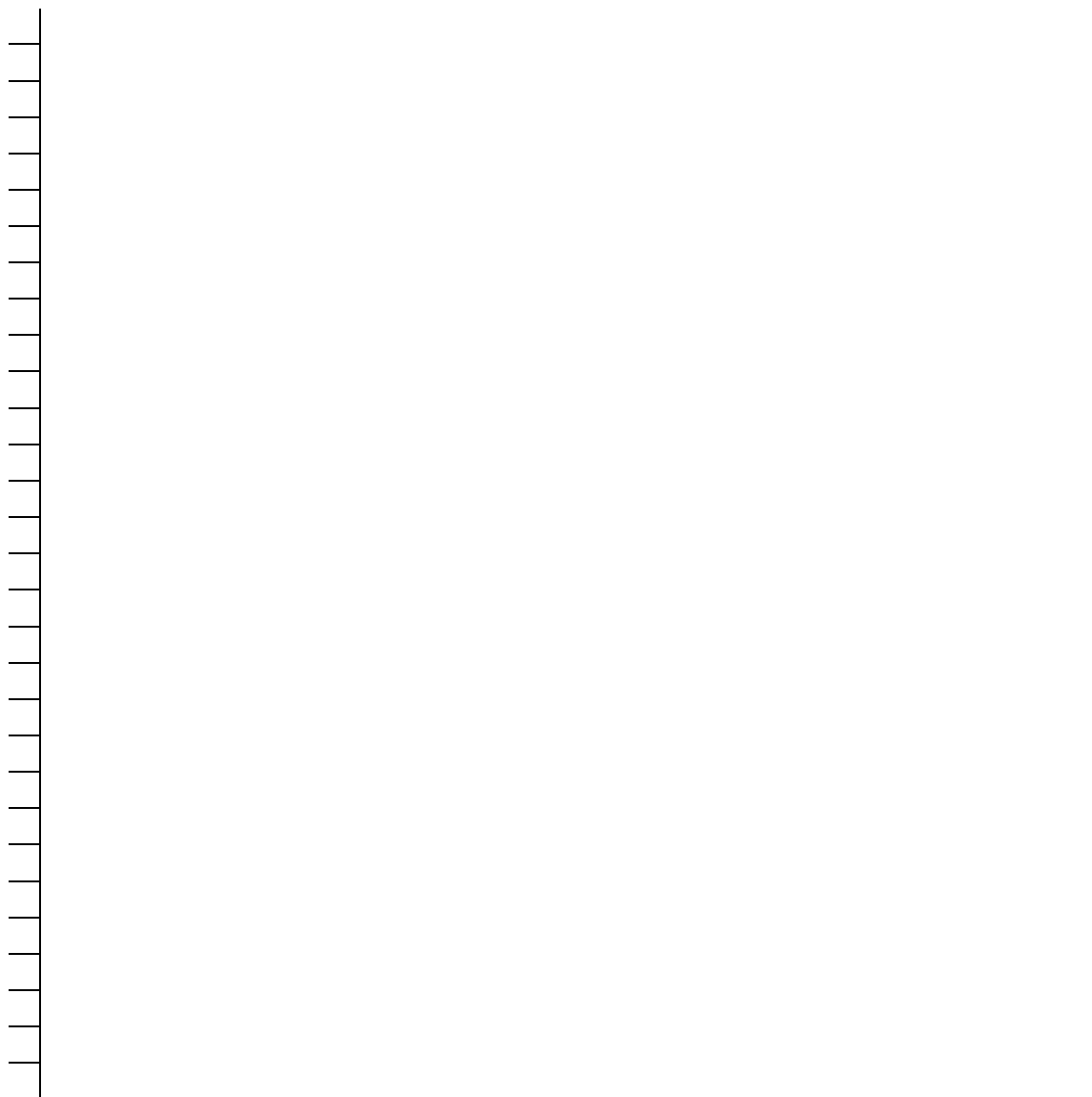
Fill in the following bar graph to display the information from the table. You should create a series of columns for each item bought. One column is for original price, one for the pre-tax price for each of the tables you filled out. In other words, each item should have four (4) columns: original price, un-taxed discount and then coupon, un-taxed coupon and then discount, un-taxed combined discount. There should be a space between each items series of columns. Make sure to label your graph: price in \$ and item names. Create a key to distinguish between the different bars.

Below is an example:



## CREATE YOUR GRAPH

Use this template to graph your findings.



## POST QUESTIONS

Answer the following questions in complete sentences.

1) Were you surprised by the results? Why or why not?

2) Which of the three options yielded the best deal? Support your answer.

3) Did the original amount of the item matter for which option was best? Yes No

4) Why do you think the solutions came out as they did? Use basic addition and multiplication to try to figure this out. Remember, to get a percentage back to a workable number, divide it by 100.

5) Do you think if you took a price, discounted it, and then taxed it the same percentage, you would end up with the same price?

Yes No

6) Let's try.

Take a \$100 item and apply a 10% discount: \_\_\_\_\_

Now apply a 10% tax: \_\_\_\_\_

Are you surprised by these findings? Explain.

7) Does using a graph make the data you calculated more or less approachable? Explain.

8) Why do you think stores offer huge discounts on select items?

9) Why do you think advertisers use graphs? Support your argument.

*(Hint: Do you think it is to make the ad more realistic or make the item more appealing?)*

**Please attach a sheet of paper with all of your ads to the end of this project. Thank you and have fun!**