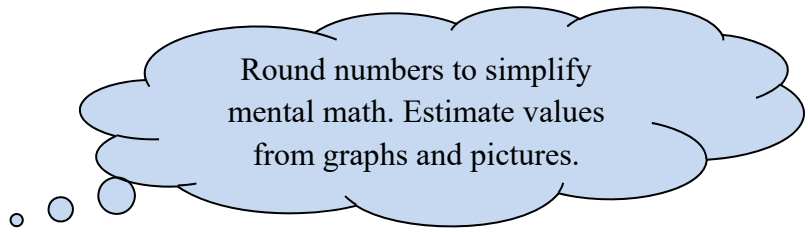
General Education Mathematics
Class Notes
Estimation (Section 1.3)



We will use estimation when we want to do a quick calculation but do *not* need an exact answer. You might estimate the tip at a restaurant or when trying to "spitball" a quick answer to a problem to get started. We will also see problems that ask you to estimate values from a graph or picture.

Rounding:

Recall, we will round a number to a certain place by looking at the digit to its right. If that digit is 5 or greater, we round up. If that digit is less than 5, we round down.

For instance, let's round 4,326 to the nearest thousand. First, picture this number somewhere between 4,000 and 5,000. We are trying to find which is closest, aren't we? Draw a real number line showing the relationship among 4,326 and 4,000 and 5,000.

We look at the thousands place (the 4, which you may want to underline). Next, we look at the digit to its right, the 3. Since it is less than 5, we round down. This gets us 4,000 (as opposed to 5,000). Does that sound familiar?

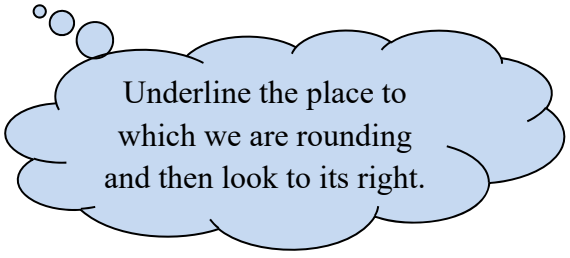
expl 1: Try some more rounding. Round the number 54,789 as indicated.

a.) Round 54,789 to the nearest 10,000

b.) Round 54,789 to the nearest 1,000

c.) Round 54,789 to the nearest 100

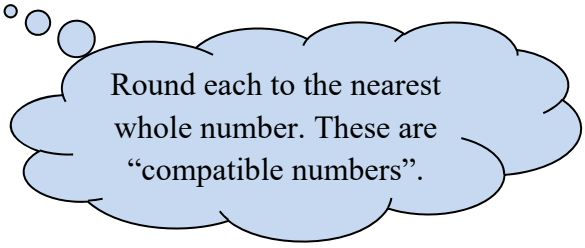
d.) Round 54,789 to the nearest 10



The book will use the term **compatible number**. This is the idea of using simpler numbers that are easier to work with in the problem.

expl 2: Estimate the answer to the following problem. Use rounding or compatible numbers.

35.8 – 19.2



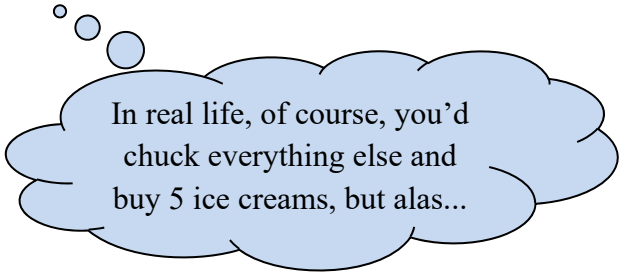
expl 3: On your way home from work, you stopped at the market to pick up the items listed in the table below. You also would like to buy a half gallon of ice cream for $3.59, but you remember that you have only $20 in your wallet and you don't want to be caught in the checkout line without enough money. Use rounding to the nearest 10 cents to answer the questions below.

a) Estimate the total cost of your purchases.

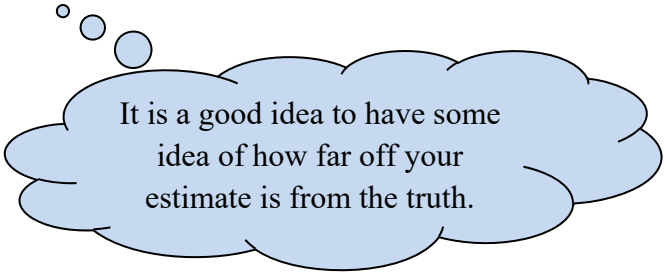
b) Decide if it is safe to put the ice cream in your cart.

Item	Cost ($)
Cereal	4.29
Milk	2.41
Bread	1.89
Lunch meat	3.36
Pickles	2.37
Dishwashing liquid	2.87

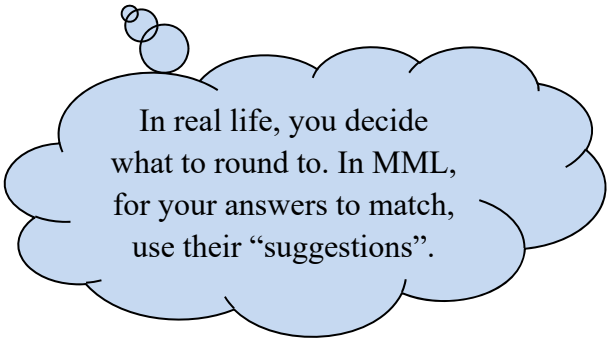
So, alongside each item's cost, write its rounded value. Add those up. Do you think you should put the ice cream in your cart too?



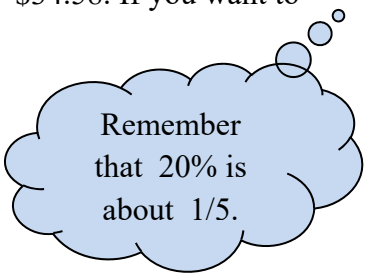
Let's examine our estimate. Do you think it is smaller or larger than the true total of those six items? Why?



expl 4: What about percents? Estimate 22% of 1530. (Round 22% to the nearest ten and 1530 to the nearest hundred.)



expl 5: You and a date are sharing the bill on dinner. Your portion is $34.58. If you want to leave about 20% for a tip, what is your tip?



Graphs and Pictures:

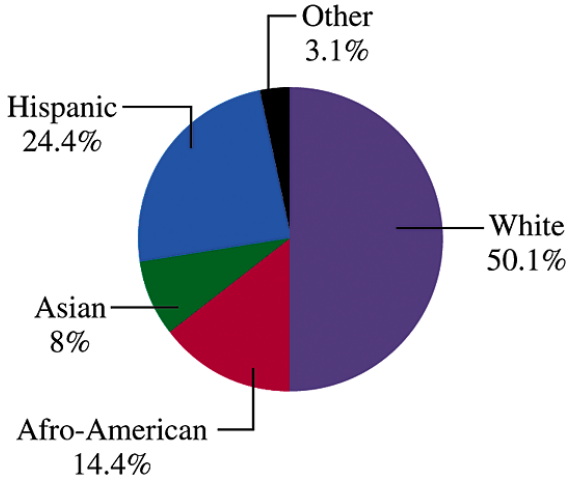
Often when we read maps or graphs, we must estimate the values. Try these problems out.

expl 6: According to the U.S. Census Bureau, by the year 2050, the population of the United States will be 419,854,000. Use the graph to estimate the number of Hispanic people who will be living in the United States in 2050. We will do this in steps.

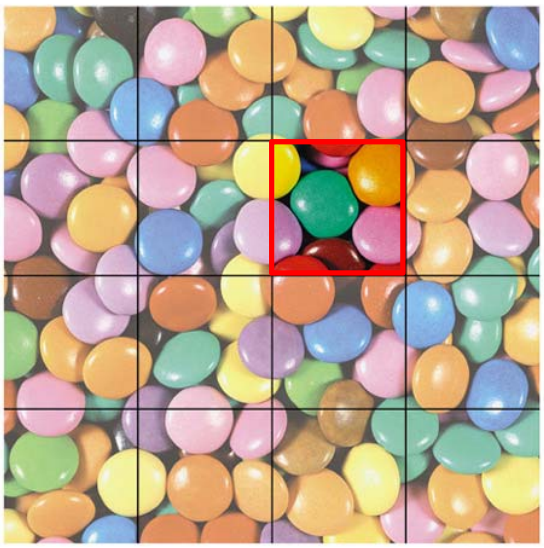
a.) Estimate the percentage given for Hispanic to an easy-to-work-with number, *not* necessarily the closest whole number.

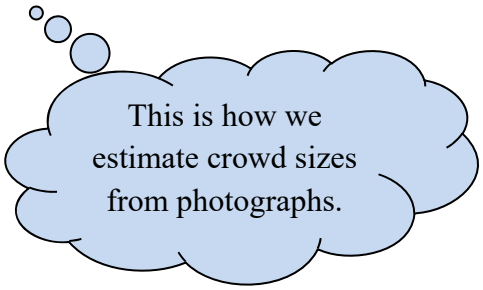
b.) Round the projected population to the nearest 100,000,000.

c.) Now, use your compatible numbers to estimate the Hispanic population in 2050.



expl 7: Estimate the number of M&Ms that are visible (even partially) in the figure. Notice one of the squares is highlighted. What is your plan?





Worksheet: Carchip Worksheet:
This worksheet helps us practice estimating and interpreting values from graphs. There is an accompanying video explaining the "Carchip" but it is not necessary.