Talk versus Text

How do the number of cell phone calls people make compare with the number of text messages they send?

Our preferred methods of communication in the United States has dramatically changed in recent years as new technology has been introduced. The two tables in this investigation contain data about the changes in cellular phone use after the introduction of text messaging. These tables give us information about how we use our cell phones.

For example, Table 1 tells us that during the second quarter of 2008, a typical US mobile subscriber placed or received 204 phone calls each month. During the same quarter, the average mobile customer sent or received 357 text messages per month. This is a 450% increase over the number of text messages circulated monthly during the second quarter in 2006.

TABLE 1

Time Period	Average Number of	Average Number of
Qtr 1, 2006	198	65
Qtr 2, 2006	216	79
Qtr 3, 2006	221	85
Qtr 4, 2006	213	108
Qtr 1, 2007	208	129
Qtr 2, 2007	228	172
Qtr 3, 2007	226	193
Qtr 4, 2007	213	218
Qtr 1, 2008	207	288
Qtr 2, 2008	204	357

* Data for this lesson was retrieved on May 1, 2012 from http://blog.nielsen.com/nielsenwire/online_mobile/in-us-text-messaging-tops-mobile-phone-calling/

1. a. What other statements can you make from the data in Table 1?

   b. What might the data for the years 2009–2012 look like?

2. The next table shows the breakdown, by age groups, for the second quarter (Q2) in 2008. US teens (ages 13 to 17) had the highest levels of text messaging in Q2 of 2008, sending or receiving an average of 1,742 text messages per month. In comparison, teens in this age group took part in an average of 231 mobile phone calls per month during the same time period.
What other statements or conclusions can you make from the data in Table 2?

TABLE 2

Age Group	Average Number of Monthly Calls**	Average Number of Monthly Text Messages**
All Subscribers	204	357
Ages 12 & Under	137	428
Ages 13-17	231	1742
Ages 18-24	265	790
Ages 25-34	239	331
Ages 35-44	223	236
Ages 45-54	193	128
Ages 55-64	145	38
Ages 65+	99	14

Source: The Nielsen Company (January 1, 2006 to June 30, 2008)
** Note: Data includes U.S. wireless subscribers only.

3. Survey 20 people from a variety of age groups. Use the same age groups as in Table 2 and record their responses in the correct age group. Ask them two questions: 1) On average, how many phone calls do you make in a month? and 2) On average, how many text messages do you send in a month?

Create a class data set and plot it. Answer the questions below based on your data.

- What trends do you notice in the data?
- Based on these trends, what can you say about the relationship between a person's age and that person's cell phone use?
- How do the graphs of the class data sets from the surveys compare against the graphs from Table 2?
- Can you say that your class data validates the trends you observed in Table 2? Why or why not?

c. How might your analysis of the data in the tables be useful? Write a report (for a cell phone provider, for example) about your findings.

Knotty Problem

What recommendations can you make for designing the knotted rope?

The Math-n-Wild Park has a hiking trail that needs maintenance. To improve conditions on a steep section of the trail, the park planners decide that they needed to provide a knotted rope for hikers to grip as they travel that part of the trail. The steep section of the trail is 20 meters long and there are sturdy trees at each end.

In order to estimate how much rope to buy, the planners need to learn more about ropes and knots. They decide to experiment with short lengths of various types of rope.

In your group, discuss ways to experiment with the length of rope you are given. Then predict how the length of a rope will change as you tie more knots along it.

Measure the length of your rope before you tie any knots and record it in a table like the one below. Tie one knot in the rope, measure the new length, and record it in the data table. Continue tying knots in the rope, measuring, and recording data.

Number of Knots	Length of Rope (cm)
0	
1	
2	
3	
4	
5	

1. What patterns do you see or what observations do you have?
2. Plot your points.
   Using the data you collected, make a prediction for the length of the rope after the 9^{th} knot is tied.
3. Validate your prediction by continuing to tie and measure until you have tied nine knots.
4. Based on the data in your table, assess the method you used to make your prediction.
5. What equation best describes your data?
   Interpret what the equation means in terms of the variables we are working with.
6. You will likely find that some of your collected data do not coincide with the data generated by your equation. Circle these points and list a few possible reasons for what may have happened.
7. Based on your findings in this lesson, what recommendations can you make for designing the knotted rope?