Mathematics

8.12 The student uses statistical procedures to describe data. The student is expected to:

(A) select the appropriate measure of central tendency or range to describe a set of data and justify the choice for a particular situation.

(B) draw conclusions and make predictions by analyzing trends in scatterplots.

(C) Select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, stem and leaf plots, circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with and without the use of technology.

Technology Applications

The student demonstrates knowledge and appropriate use of hardware components, software programs, and their connections. The student is expected to:

(1)(a) demonstrate knowledge and appropriate use of operating systems, software applications, and communicate and networking components.

(1)(c) demonstrate the ability to select and use software for a defined task according to quality, appropriateness, effectiveness, and efficiency.

(1)(f) perform basic software application function including, but not limited to, opening an application program and creating, modifying, printing, and saving documents.

(1)(h) use terminology related to the Internet appropriately including, but not limited to, electronic mail (e-mail), Uniform Resource Locators (URLs), electronic bookmarks, local area networks (LANs), wide area networks (WANs), World Wide Web (WWW) page, and HyperText Markup Language (HTML).

The student uses a variety of strategies to acquire information from electronic resources, with appropriate supervision. The student is expected to:

(4)(a) Use strategies to locate and acquire desired information on LANs and WANs, including the Internet, intranet, and collaborative software.

Materials

Advanced Preparation:

- Internet access to **http://www.ssa.gov/OACT/babynames/**
- Copies of **Round and Round**, **Baby Names**, and **What's In A Name** worksheets for each student
- Access to a **TI-73** for each student or pair of students

For whole class demonstration:

- Transparencies 1 - 5
- Several hula hoops (up to 1 per 2 students to save time)

- Chart paper, markers

For each student:

- **Round and Round** worksheet
- **BabyNames** worksheet
- **What's In A Name** worksheet
- TI-73

ENGAGE

The Engage portion of the lesson is designed to create student interest in the concepts addressed. This part of the lesson is designed for whole class discussion/ demonstration.

1. Prompt a student to read the "Problem" aloud from **Transparency 1** and ask students to individually consider their prediction.
2. Prompt students to share their predictions with a neighbor before getting responses from the large group.

Facilitation Questions

- What data are you collecting and comparing for each student?
  We are looking for, and comparing, the number of revolutions on the first attempt and the number of revolutions on the second attempt.
- Once several students have recorded their predictions on the numbers of revolutions on the first attempt, what will you need to consider when making predictions about the second attempt?
  *Answers may vary, but you are looking for the fact that students recognize that, chances are, the change in the number of revolutions between attempts will not be exactly the same for all students—some will increase, some will not. Instead, they should look for trends that describe the change, such as "The number of revolutions for the second attempt **tends** to be _____."*
- Will your prediction be true for every student? Why or why not?
  No. Point out that this exemplifies how "real" data often does not fit into "clean" or exact patterns such as linear patterns. Instead, we have to look for any trends in the data.
- How many pieces of data would you need to make a prediction about the number of revolutions on a second attempt?
  Answers may vary, but you are looking for students to recognize that the more data you have, the better defined any correlation will be.

3. Show the table on **Transparency 2** that will be used to collect the data and agree on a sample size of 10 to 15 students. You may want to agree ahead of time as to whether or not each student will be allowed a practice attempt. (If hula-hoops are not available, you can substitute another event such as paddle-ball, trash can

basketball, etc. The goal is to choose an event where the trend in the data is not obvious or that you could make a case for multiple trends. For example, one might make the case that students would have more revolutions with the hula-hoop on their 2nd attempt because of the practice they got during the 1st attempt or that they would have fewer on their 2nd attempt because they were tired from the 1st attempt or that there would be no clear correlation.)

4. Pair the students. One will hula-hoop twice and the other will record the number of revolutions on the 1st and 2nd attempt on **Transparency 2**.

Facilitation Questions

- If a student is able to complete 6 revolutions on the first attempt, what could happen on the second attempt? Why?
  The number of revolutions could be more than 6, less than 6, or the same as 6 on the second attempt.
- If that same student were able to make 10 revolutions on the second attempt (an increase of 4 over the first attempt), would this mean that the same will be true for the next student? Why?
  Possibly, but possibly not—we do not have enough data to make that prediction yet.

EXPLORE

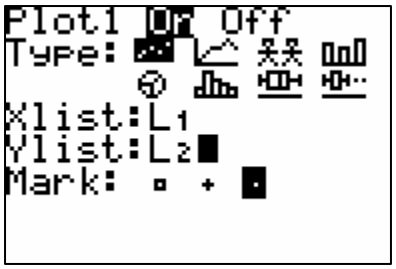
The Explore portion of the lesson provides the student with an opportunity to be actively involved in the exploration of the mathematical concepts addressed. This part of the lesson is designed for groups of 2 students or individual investigation.

1. Distribute a TI-73 to each student (or pairs of students if there is not enough technology available).
2. Distribute and go over the directions on the **Round and Round** worksheet.
3. Direct the students to input their student data from **Transparency 2** in List 1 and List 2.

Facilitation Questions

- What will you put in list 1 [L1] and what will you put in list 2 [L2]?
  List 1 will contain values from the data on the 1st attempt, and list 2 will contain values from the data on the 2nd attempt.
- Is the order in which you input the values important? Why or why not?
  The order in which the pairs of data are input is not important, but keeping the pairs of values within the same row on the list is important. In other words, it is acceptable to input the data from student #2 before the data from student #1, but it is not acceptable to pair the value of the 1st attempt from student #1 with the value of the 2nd attempt from student #2.

4. Create a scatterplot. Press [2nd][Y=] to access the Plot menu. Press [ENTER] to set the plot as shown below.



5. Press [WINDOW] to set an appropriate window that would contain the data.

Facilitation Questions

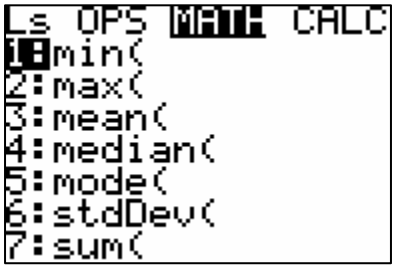
- Based on our data, what will you need to consider when setting the Xmin and Xmax in the window?
  The Xmin will need to be as small or smaller than the least value in list 1 and the Xmax will need to be as large or larger than the greatest value in list 1.
- Based on our data, what will you need to consider when setting the Ymin and Ymax in the window?
  The Ymin will need to be as small or smaller than the least value in list 2 and the Ymax will need to be as large or larger than the greatest value in list 2.
- How would you describe any trends that you might see in the scatterplot drawn from the data from your class?
  Answers may vary depending on the data collected. Look for statements such as "As the number of revolutions during the 1st attempt increases, the number of revolutions during the 2nd attempt (increases/decreases)." Or "Students tend to _____ ."

6. Point out the three scatterplots on the **Transparency 3**. Make sure the students understand that these were drawn based on fictitious data, and not their own, as they answer questions #1 – 7 on the worksheet.

Facilitation Questions

- Describe a possible scenario that would produce each of the three scatterplots.
  Answers may vary…
  Scatterplot A – Due to their practice in attempt 1, students were able to make more revolutions in attempt 2.
  Scatterplot B – Due to their efforts in attempt 1, students did not have as much energy to make as many revolutions in attempt 2.
  Scatterplot C – Some students followed the explanation of the scenario for scatterplot A and some for scatterplot B…no clear pattern for the group as a whole.

7. Prompt the students to calculate and compare the measures of central tendencies, including mean, median, and mode (worksheet #8 and 9).
   a. Go to the home screen.
   b. Press [2nd][LIST] then arrow over to the Math menu. Choose the appropriate measure.



   c. Press [ENTER]. Then press [2nd][LIST] to choose the appropriate list. Press [ENTER].
   d. Record on chart paper.

	List 1	List 2
Mean		
Median		
Mode		

Facilitation Questions

- What do mean, median, and mode describe about any set of data?
  Answers may vary…
  Mean – the value of each data point should all data points be "evened out"
  Median – the value of the data point in the "middle" when considering the data points in numerical order (one-half are equal or greater than the median and one-half are equal or less than the median)
  Mode – the value of the data point that occurs more often than other data points
- Looking at your data, how do the mean, median, and mode for the 1st attempt compare to that in the 2nd attempt? What might this imply about the comparison of the number of revolutions in the 2nd attempt as related to those in the 1st attempt?
  Answers may vary.
- Have the students share their answer to #9. What are you looking for in the data when you try to determine the measure of central tendency that will best describe the data?
  Answers may vary.
  Mean – data is clustered with no outliers
  Median – most of the data is clustered except for one or more outliers
  Mode – if one piece of data appeared significantly more times than others

EXPLAIN

The Explain portion of the lesson is directed by the teacher to allow the students to formalize their understanding of the TEKS addressed in the lesson.

1. Once the students have completed their work, put up **Transparency 3** to debrief.
2. Guide the students in drawing trendlines (if possible) on the three original scatterplots. Select students to draw possible trendlines on the transparency. Discuss any differences in opinion. Use the trendlines to make predictions.

Facilitation Questions

For each scatterplot (A, B, C)

- Draw a line that would include the data points if the number of revolutions on the second attempt for each student was the same as their first attempt. ($y=x$) Does this line "fit" the data? Why or why not?
  Answers may vary. Line y = x will best "fit" to scatterplot A because it follows a similar trend…as x increases, y increases. Line y = x does not "fit" with scatterplots B or C because the data on those scatterplots does not fit a similar trend…as x increases, y increases.
- For each scatterplot, is it possible to draw a line on the scatterplot in such a way that it better exemplifies the relationships/trends in the data?
  Answers may vary. Minor adjustments (as compared to line y = x) may be made for scatterplot A, whereas the trend lines for scatterplots B and C should be significantly different than line y = x.
- (After drawing a trendline for scatterplot A) Consider the points that would fall on or near the trendline we drew. As the number of revolutions made on the 1st attempt increases, what happens to the corresponding number of revolutions made on the 2nd attempt? *They increase as well.*
- What type of correlation (trend) is this?
  A positive correlation (trend)
- Based on this trendline, about how many revolutions would you expect students to make on their second attempt if they made 13 revolutions on their 1st attempt? What about if they had made 30 revolutions? 50 revolutions?
  Answers may vary slightly depending on how the trendline was drawn.
- (After drawing a trendline for scatterplot B) Consider the points that would fall on or near the trendline we drew. As the number of revolutions made on the 1st attempt increases, what happens to the corresponding number of revolutions made on the 2nd attempt? *They increase.*
- What type of correlation(trend) is this?
  A positive correlation(trend).
- Based on this trendline, about how many revolutions would you expect students to make on their second attempt if they made 13 revolutions on their 1st attempt? What about if they had made 30 revolutions? 50 revolutions?
  Answers may vary slightly depending on how the trendline was drawn.

Facilitation Questions

- (After attempting to draw a trendline for scatterplot C) Why is it more difficult to draw a trendline on this scatterplot?
  Answers may vary. Students should note that there is no clear pattern in the number of revolutions on the 2nd attempt (increasing or decreasing) as the number of revolutions increases on the 1st attempt. Visually, the points do not cluster around any line, rather they are spread more randomly throughout the scatterplot.
- What type of correlation (trend) is this?
  There is no correlation (trend).
- Knowing we did not draw a trendline, about how many revolutions would you expect students to make on their second attempt if they made 13 revolutions on their 1st attempt? What about if they had made 30 revolutions? 50 revolutions?
  With no clear trend, it is impossible to make a prediction based on this data alone.

3. Use **Transparency 4** to discuss looking at the data in relationship to the means or medians.
4. Draw in the mean lines and discuss the characteristics (in relationship to the mean) of the pieces of data in each of the four resulting quadrants.

Facilitation Questions

- Another way of looking at the data, other than a trendline, is to look at it in relationship to a central tendency such as mean or median. Look at scatterplot C where it was difficult to draw a trendline. What is the mean(average) number of revolutions made on the 1st attempt?
  8.6667 (Draw in a vertical line at 8.6667 on the x-axis.)
- About how many data points fell below the mean? above the mean? What does this say about the data from those students?
  6 below…3 above… Rationale may vary…should include a discussion about outliers and/or the spread of the data.
- What is the mean(average) number of revolutions made on the 2nd attempt?
  10.44 (Draw in a horizontal line at 10.44 on the y-axis.)
- About how many data points fell below that mean? Above the mean? What does this say about the data from those students?
  4 below…5 above… Rationale may vary…should include a discussion about outliers and/or the spread of the data.

Facilitation Questions

- When you look at both mean lines, the data points divide into 4 groups. Describe the characteristics of each group.
  Below the average on both attempts, below the average on the 1st attempt and above the average on the 2nd, above the average on the 1st attempt and below the average on the 2nd, above average on both attempts
- Why do you think the number of data points varies from group to group?
  The lines were drawn using the mean values. Outliers may "pull" the line away from the center.

5. Draw in the median lines and discuss the characteristics (in relationship to the mean) of the pieces of data in each of the four resulting quadrants.

Facilitation Questions

- If you were to do the same for the median lines, how do you think the data will be spread between the 4 groups?
  Because the medians are the midpoints, the data should be evenly spread between the groups.
- Why might you want to look at the data in this manner?
  Answers may vary. This is another way (other than trend lines) to communicate the relationship between the number of revolutions on the corresponding 1st and 2nd attempts.

ELABORATE

The Elaborate portion of the lesson provides an opportunity for the student to apply the concepts of the TEKS within a new situation. This part of the lesson is designed for ***groups of 2 students or individual investigation.***

1. Distribute a **Baby Name** worksheet to each student.
2. Read the "Given" and the "Question" and have students turn to a neighbor and share their thoughts before sharing with the large group.

Facilitation Questions

- Read the "Given" statements and tell me what that means in your own words.
  Answers may vary. Look for paraphrasing that connects "popularity" of names with frequency and the concept of ranking.
- Why might the popularity of certain names vary over time?
  Answers may vary. Students might consider factors such as culture, famous figures, etc.
- Read the "Question" and turn to your neighbor and share your thoughts. (Pause) Do you think there will be a difference in the change in popularity of boy names versus girl names? Why or why not?
  Answers may vary. Accept all answers for now.

3. Read through the directions and make sure students can access the data website **(http://www.ssa.gov/OACT/babynames/)** or print and have hard copies of the data available if using the Internet is not an option. NOTE: Using technology to search on the Internet is much more efficient than searching on paper.
4. Begin completing the table for the boy names as a large group to ensure students are comfortable with accessing the appropriate data.

Facilitation Questions

- (After locating the top ten boy names for 1965…) Look at the data source and explain again how certain names make this list and others do not.
  Answers may vary. Students should determine that the data comes from counting the number of times a particular first name was put on applications for Social Security cards for newborns. Ex. Since "Michael" is ranked first, this means that there were more newborns with the first name of "Michael," according to the information parents gave on their baby's Social Security card application, than any other first name.

5. Direct the students to create a scatterplot as before. Once the scatterplot is complete, direct the students' attention to the questions for the scatterplot which will have them calculate and interpret the mean, median, and range of the data. Use **Transparency 5** to debrief the activity.

Facilitation Questions

- (Upon completion of the scatterplot…) Have students share their answers to the questions below the scatterplot.
  Answers may vary..
- What was the only central tendency not calculated in the activity?
  Mode
- Why do you think mode was not included?
  Since the names each have a unique rank (understanding that it would be highly unlikely that two names would occur exactly the same number of times), there will be no mode.
- When answering #9, what characteristics in the data made you choose to draw the lines for the mean or for the median?
  Answers may vary. Look for some discussion of clustering of data and/or outliers.
- (Transparency 5 – Draw in the lines based on the discussion from the previous question, then draw in a line representing the ranking from 1965.) Describe the relationship among the three lines.
  Answers may vary. Students should note that the central tendency line for the rankings of boy names is much closer to the line representing the rankings in 1965…a visual demonstrating how the popularity of those boy names has remained somewhat steady in comparison to the girl names of similar rankings.
- Look at the lines you drew on the scatterplot. Would you say, based on the data you have, that you could better predict the change in popularity of a boy name or a girl name?
  Answers may vary. Since the points representing boy names are more clustered around that line, chances are the popularity of a boy name will change less than that of girl names with similar original rankings.
- Think back to your response to the "Question" at the beginning of the activity. Given the additional information you now have, do you need to revise or elaborate on your initial thoughts?
  Answers may vary. In general, the selection of names for girls tends to be more susceptible to varying trends than names for boys. In other words, based on the data for the names we researched, the popularity of a particular name for a girl is much more likely to change over time; whereas the popularity for a particular name for a boy is more likely to remain somewhat steady. Just a thought…This could be related to the custom many have of designating males as the ones who will carry on the family name.
- How are the trends in this data similar to or different than the any trend you saw in your data from the hula hoop experiment?
  Answers may vary. For example, if there was no clear trend between the numbers of revolutions made on the 1st and 2nd attempts, students might see similarities between that data and the data for the girl names.

EVALUATE

The Evaluate portion of the lesson provides the student with an opportunity to demonstrate his or her understanding of the TEKS addressed in the lesson.

1. Distribute **What's In A Name?** activity sheet to each student.
2. Upon completion of the **What's In A Name?** activity sheet, the teacher should use a rubric to assess student understanding of the concepts addressed in this lesson.
   Answers may vary somewhat…around 20,000 people with the top ranking boy name in 2010
   Justifications may vary…Based on the data in this scatterplot, there is a negative correlation between the year and the number of people with the top ranking boy name. As the years increase, the number of people with the selected name decreases. If this trend was to continue, you would expect around 20,000 people with the top ranking boy name in 2010. Students could also justify their prediction with one of the statistical measures such as finding a range and extending it to future years.

Answers and Error Analysis for selected response questions:

Question Number	TEKS	Correct Answer	Conceptual Error	Conceptual Error	Procedural Error	Procedural Error	Guess
1	8.12(B)	A	B	C			D
2	8.12(B)	C	A	B			D
3	8.12(A)	B	A	D	C		D
4	8.12(B)	A	D		B		C

Round and Round

A. Input your class data from Transparency 2.
Sketch the resulting scatterplot.

Will vary depending on data

B. For each statement, choose the scatterplot(s) that best represents the situation.

___*A, B, C*____1. After the 1st attempt, most students were able to increase the number of revolutions on their 2nd attempt.

____*none*___ 2. After the 1st attempt, most students made fewer revolutions on their 2nd attempt.

____*A*____ 3. The number of revolutions on the 1st attempt is about the same as the number of revolutions on the 2nd attempt.

____*C*_____ 4. There is not a strong relationship between the number of revolutions made in the two attempts.

____*B*_____ 5. Most students did considerably better on their 2nd attempt than on their 1st attempt.

___*vary*____ 6. Based on the data you have from your class, which scatterplot would look most like yours? Explain.

Round and Round (continued)

7. Now that you have analyzed possible scenarios for scatterplots A, B, and C, write a statement that describes the relationship between the 1st attempt and 2nd attempt for your class.
Answers may vary.

8. Use formulas to calculate the mean, median, and mode of the data for the 1st attempt and for the 2nd attempt. Record the results below.
Answers may vary.

	1st attempt	2nd attempt
mean		
median		
mode		

9. Which measure of central tendency best describes the number of revolutions made on the 1st attempt and 2nd attempt? Explain your choice.
Answers may vary.

Baby Names

(based on data from Social Security card applications)

Given: Some baby names are more popular (occur more often) than others. The list of the most popular baby names changes from year to year. While some names are used less over time, others remain popular.

Question: Over the last 40 years, do you think boy names or girl names have been less "trendy"? In other words, do you think children in your generation are more likely to have the same names as adults in your parents' generation if they are boys or girls? Today you will research to compare the ranking of the most popular names in the year 1965 to the ranking of those names in the year 2004 (a span of 40 years).

Directions:
1. Go to the website below to determine the top 10 names for boys and girls in the year 1965.
2. Record the names missing in the tables below.
3. Look up ranks missing for each name for the year 2004 and add that data to the chart. (The database lists the top 1000 names. Use a rank of 1001 if a name is not included.)

http://www.ssa.gov/OACT/babynames/

BOYS		
Name	**1965 Rank**	**2004 Rank**
Michael	1	**2**
John	2	18
David	3	**16**
James	4	17
Robert	5	**29**
William	6	**8**
Mark	7	113
Richard	8	**92**
Thomas	9	37
Jeffrey	10	**149**

GIRLS		
Name	**1965 Rank**	**2004 Rank**
Lisa	1	**431**
Mary	2	**63**
Karen	3	154
Kimberly	4	**61**
Susan	5	565
Patricia	6	**317**
Donna	7	781
Linda	8	**422**
Cynthia	9	**222**
Angela	10	105

4. Looking at the data in the table, what do you notice about the change in rank of the top 10 names for boys versus the change in rank of the top 10 names for girls over the last 40 years?
Answers may vary. Students should note that the change in the rankings of the girls names is much larger than that of the boys.

5. Looking at the data in the scatterplot, explain how any observations you made from the table in #4 are reflected in the scatterplot.
Answers may vary. Students should note that the points representing the rankings of the girls names are much more spread apart (compared to their rank in 1965) than the boys.
6. Calculate the mean rank of the given boy names for 2004 and girl names for 2004. How many boy names and how many girl names were more popular than the mean rank?
7 boy names and 5 girl names are less than their respective means, therefore more popular.
7. Calculate the median rank of the given boy names for 2004 and girl names for 2004. How many boy names and how many girl names were more popular than the median rank?
5 boy names and 5 girl names are less than their respective medians, therefore more popular.
8. Calculate the range in the rankings of the given boy names for 2004 (cell B43) and girl names for 2004. How does the range value for the boys compare to that of the girls? What does this mean?
Answers may vary. Students should note that the range in 2004 rankings for the boys is much smaller than that of the girls, meaning their rankings are closer together in value.
9. Determine whether the mean or median best describes the data. Position the lines below the scatterplot (solid for boys and dashed for girls) on the scatterplot to represent these measurements. What does the position of the lines on the scatterplot emphasize about the relationship between how the popularity of the top ten names for boys and girls has changed from your parents' generation to now?
Answers may vary…a case could be made for the median being the better descriptor due to the wide spread in the data. In either case, students should note that any change in popularity over time was more dramatic for girl names than it was for boy names since that line is farther from the original rankings.
10. Describe the relationship between the points on the scatterplot and the lines you drew in #9 for the boy names and the girl names. What does this mean?
Answers may vary. The points representing rankings of the boy names are much closer to that line than the points representing rankings of the girl names are to their line.

Transparency 1

How many revolutions of a hula hoop can you achieve in one attempt?

Will this prediction change for a second attempt? Why or why not?

How might we gather data to test our predictions?

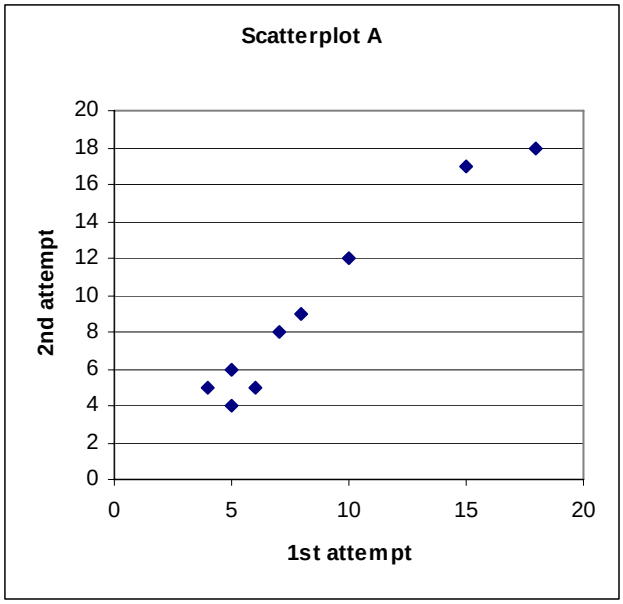
Transparency 2

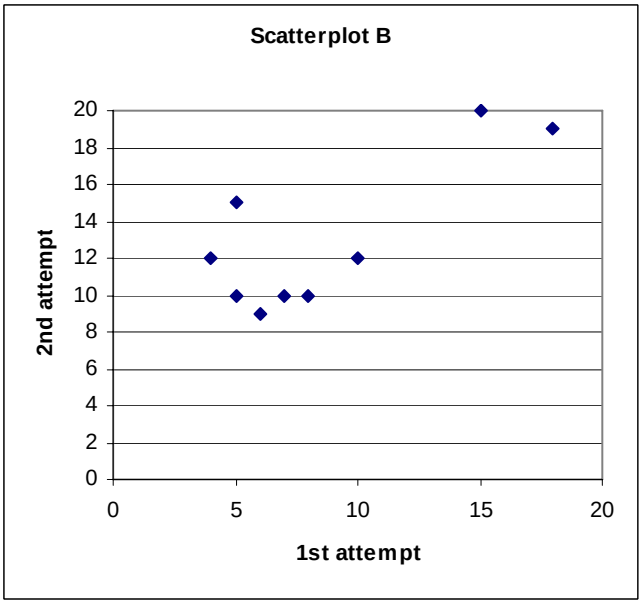
Student	# Revolutions on 1st Attempt	# Revolutions on 2nd Attempt

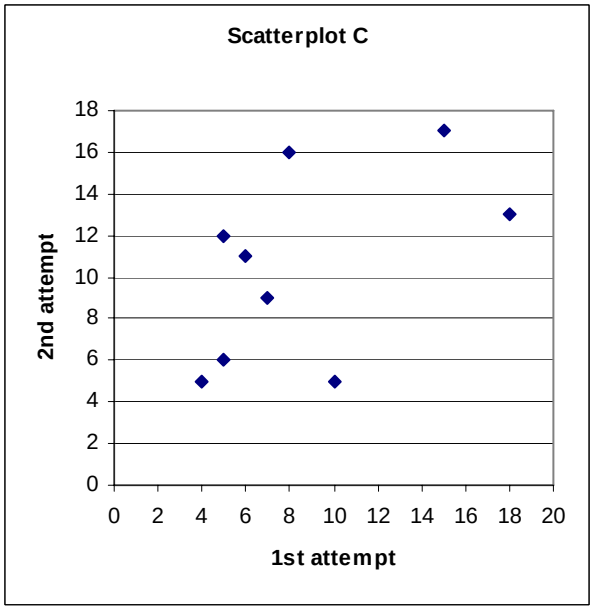
Transparency 3

1. If possible, sketch a trendline.

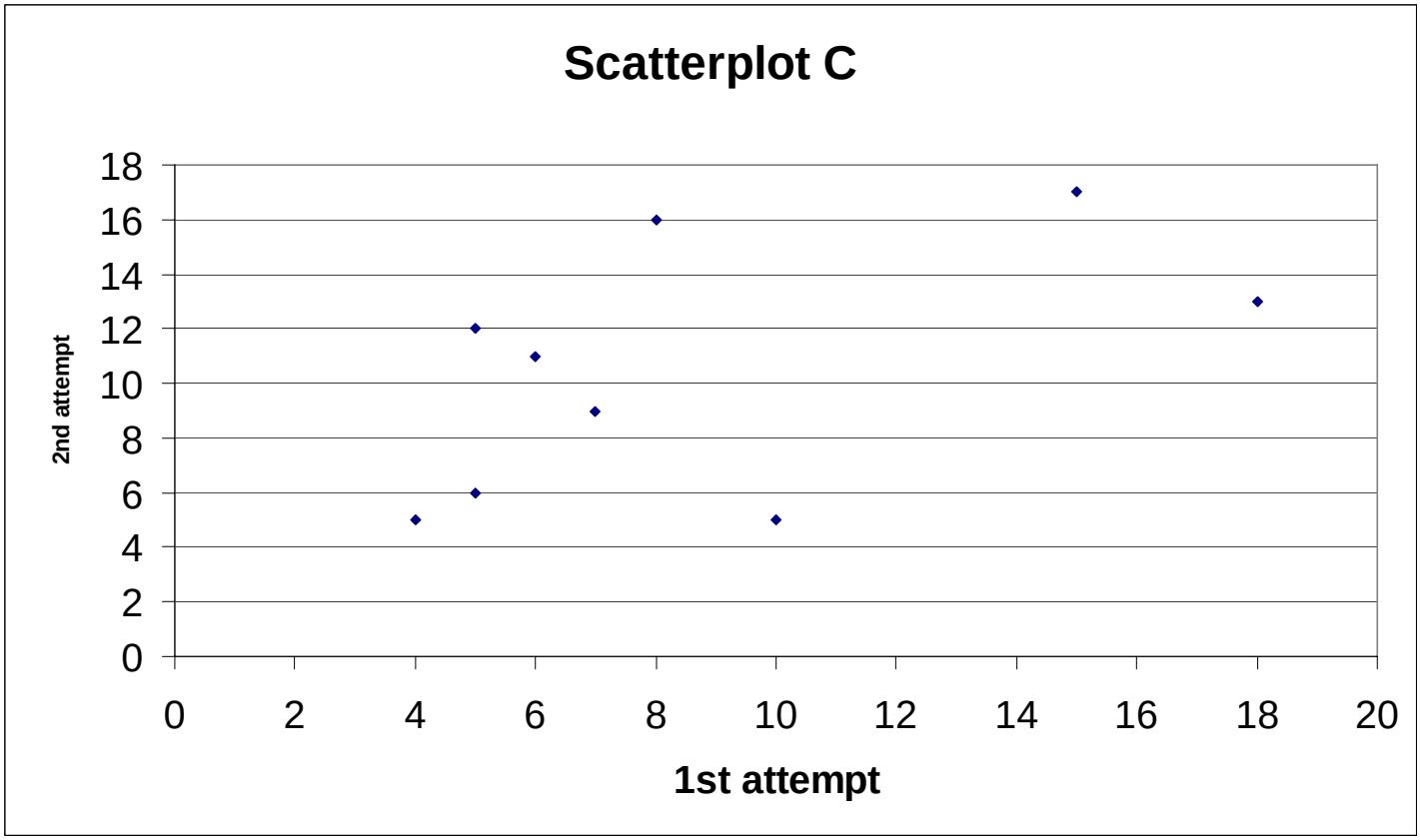
2. Predict the number of revolutions on the 2nd attempt if the number on the 1st attempt was 13...30...100.





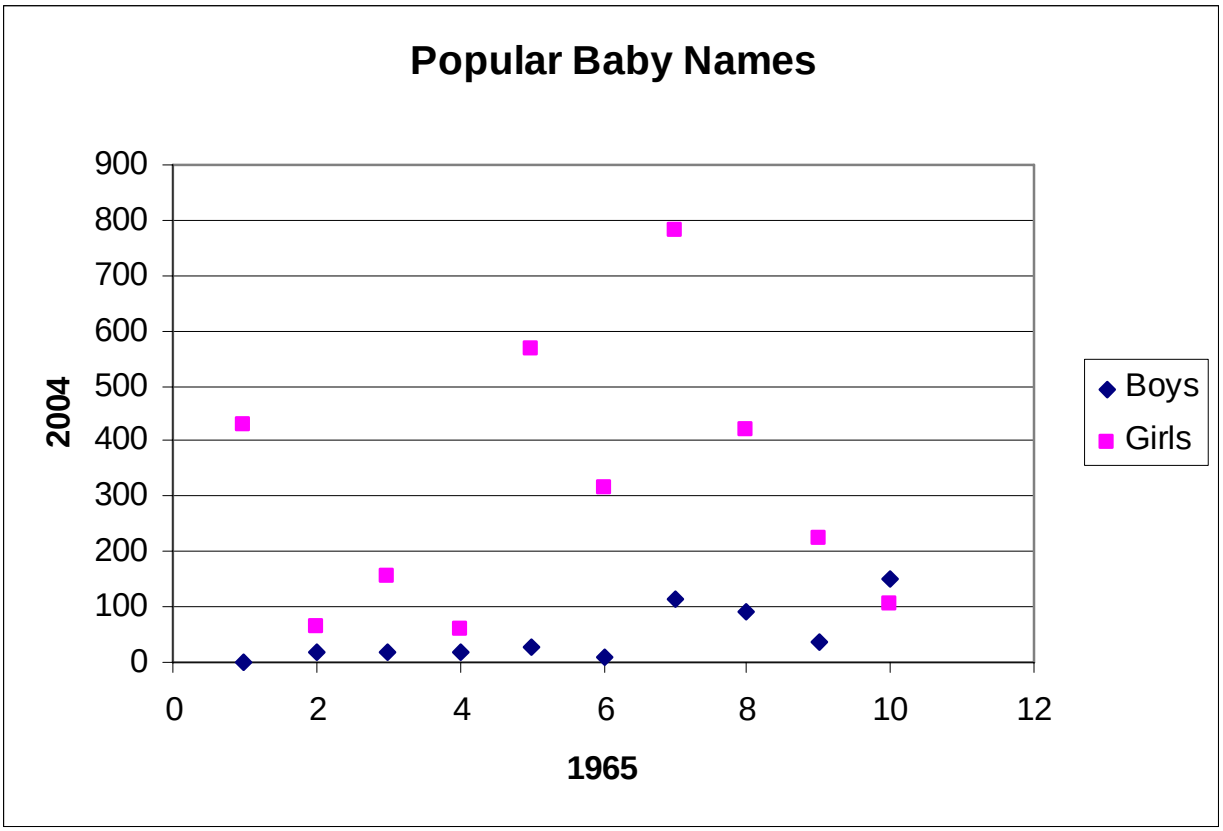


Transparency 4



	1st attempt	2nd attempt
mean	8.6667	10.44
median	9.0741	10.94

Transparency 5



	1965 — — —	2004 – Boys – – – – –	2004 – Girls .....
Mean	5.5	48.1	312.1
Median	5.5	23.5	269.5
Range	9	147	504

Student Name(s)_____ Date_____

Round and Round

A. Input your class data from Transparency 2. (Use the table that starts in row 6.)

Sketch the resulting scatterplot.

B. For each statement, choose the scatterplot(s) that best represents the situation.

_____1. After the 1st attempt, most students were able to increase the number of revolutions on their 2nd attempt.

_____2. After the 1st attempt, most students made fewer revolutions on their 2nd attempt.

_____3. The number of revolutions on the 1st attempt is about the same as the number of revolutions on the 2nd attempt.

_____4. There is not a strong relationship between the number of revolutions made in the two attempts.

_____5. Most students did considerably better on their 2nd attempt than on their 1st attempt.

_____6. Based on the data you have from your class, which scatterplot would look most like yours? Explain.

Student Name(s)_____ Date_____

Round and Round (continued)

7. Now that you have analyzed possible scenarios for scatterplots A, B, and C, write a statement that describes the relationship between the 1st attempt and 2nd attempt for your class.

8. Use formulas to calculate the mean, median, and mode of the data for the 1st attempt and for the 2nd attempt. Record the results below.

	1st attempt	2nd attempt
mean		
median		
mode		

9. Which measure of central tendency best describes the number of revolutions made on the 1st attempt and 2nd attempt? Explain your choice.

Baby Names

(based on data from Social Security card applications)

Given: Some baby names are more popular (occur more often) than others. The list of the most popular baby names changes from year to year. While some names are used less over time, others remain popular.

Question: Over the last 40 years, do you think boy names or girl names have been less "trendy"? In other words, do you think children in your generation are more likely to have the same names as adults in your parents' generation if they are boys or girls? Today you will research to compare the ranking of the most popular names in the year 1965 to the ranking of those names in the year 2004 (a span of 40 years).

Directions:
1. Go to the website below to determine the top 10 names for boys and girls in the year 1965.
2. Record the names missing in the tables below.
3. Look up ranks missing for each name for the year 2004 and add that data to the chart. (The database lists the top 1000 names. Use a rank of 1001 if a name is not included.)

http://www.ssa.gov/OACT/babynames/

BOYS		
Name	**1965 Rank**	**2004 Rank**
	1	
John	2	18
David	3	
James	4	17
	5	
William	6	
	7	113
Richard	8	
Thomas	9	37
Jeffrey	10	

GIRLS		
Name	**1965 Rank**	**2004 Rank**
	1	
Mary	2	
	3	154
Kimberly	4	
Susan	5	565
Patricia	6	
Donna	7	781
	8	
Cynthia	9	
Angela	10	105

Baby Names

4. Looking at the data in the table, what do you notice about the change in rank of the top 10 names for boys versus the change in rank of the top 10 names for girls over the last 40 years?

5. Looking at the data in the scatterplot, explain how any observations you made from the table in #4 are reflected in the scatterplot.

6. Calculate the mean rank of the given boy names for 2004 and girl names for 2004. How many boy names and how many girl names were more popular than the mean rank?

7. Calculate the median rank of the given boy names for 2004 and girl names for 2004. How many boy names and how many girl names were more popular than the median rank?

8. Calculate the range in the rankings of the given boy names for 2004 and girl names for 2004. How does the range value for the boys compare to that of the girls? What does this mean?

9. Determine whether the mean or median best describes the data. Position the lines below the scatterplot (solid for boys and dashed for girls) on the scatterplot to represent these measurements. What does the position of the lines on the scatterplot emphasize about the relationship between how the popularity of the top ten names for boys and girls has changed from your parents' generation to now?

10. Describe the relationship between the points on the scatterplot and the lines you drew in #9 for the boy names and the girl names. What does this mean?

What's In A Name?

1. Access the website **http://www.ssa.gov/OACT/babynames/** . In an earlier activity we compared the ranking of the top ten names of your parents' generation (1965) to the ranking of those names today to answer the question about how the popularity of names stands the test of time.
   a. Consider the following set of questions.
      How has the number of people having the most popular boy name changed over the last 10 years? How many people do you predict might have the most popular name in 2010?
   b. Fill in the table using the website.

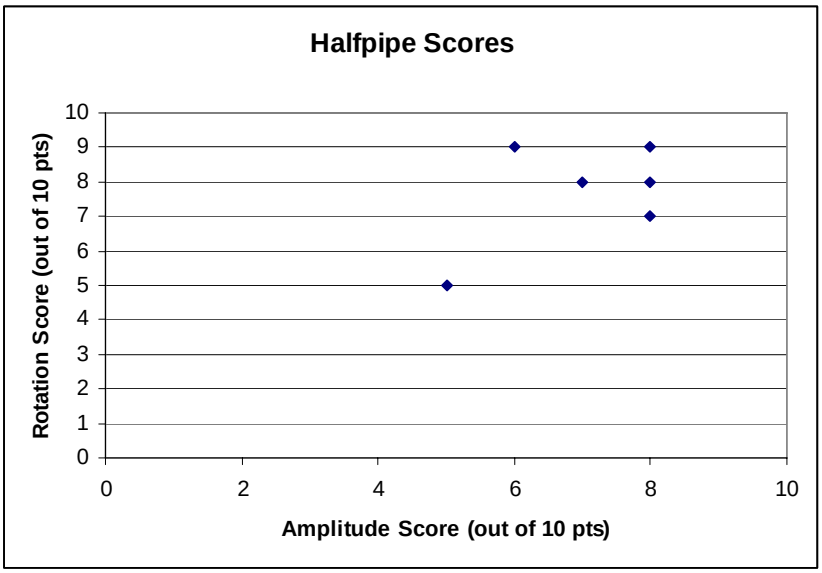
?	?

   c. Use the TI-73 to create a scatterplot.
   d. Draw a trendline if appropriate.
   e. Calculate the mean, median, and range of your data.

Minimum	
Maximum	
Mean (average)	
Median	
Mode	
Range	

   f. Respond to the questions in part a. Justify your answers using the scatterplot, trendline, and/or statistical measurements to support your conclusions.

1. The scatterplot below compares the score for amplitude (height) to the score for rotations (spins and flips) for six skateboarders at the weekend meet.



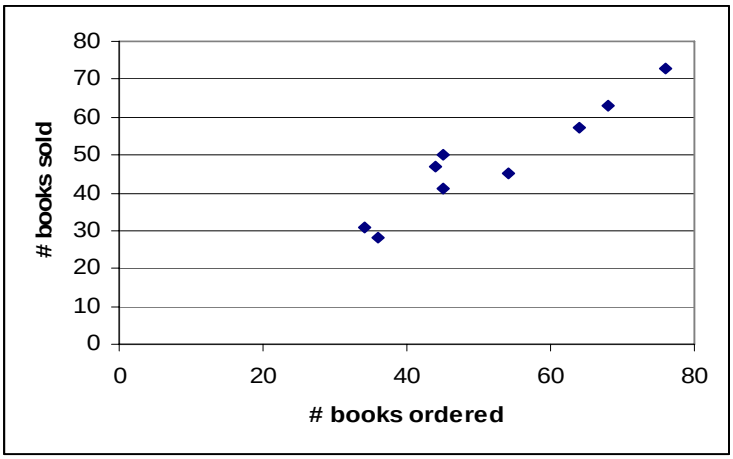
Which of the following statements would be supported by the scatterplot?

A. As the score for amplitude increases, the score for rotations tends to increase.
B. As the score for amplitude increases, the score for rotations tends to decrease.
C. As the score for rotations increases, the score for amplitude tends to decrease.
D. The score for rotations tends to be the same as the score for amplitude.

2. Which relationship, when graphed on a scatterplot, would **not** be described as having a positive trend?

A. Height of a student compared to his/her weight
B. The amount of money earned babysitting compared to the number of hours spent babysitting
C. The number of miles driven compared to the amount of gas in the tank of the car
D. All of the above relationships have a positive trend.

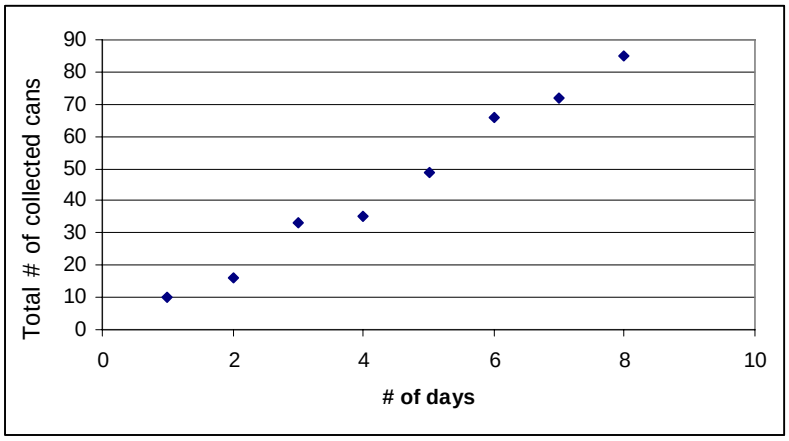
3. The following scatterplot compares the number of books ordered through the school fund raiser to the number of books that were actually paid for and sold.



If the mean(average) number of books ordered is about 52, estimate the mean(average) number of books sold based on the trends in data in the scatterplot.

A. greater than 49
B. between 47 and 49
C. between 45 and 47
D. less than 45

4. Ms. Smith's class is collecting aluminum cans for a recycling project as shown in the scatterplot below.



At this rate, about how many days will it take to collect 150 cans?

A. 15 days
B. 10 days
C. 20 days
D. 150 days