

Title: Football Fanatics**Brief Overview:**

Football Fanatics teaches fourth grade students how to construct and interpret line plots. Students will collect data based on the length they can throw a football by measuring to the nearest foot and the number of footballs they can kick through a goal post in 45 seconds. Also, they will measure the circumference of their head to the nearest whole inch to determine their potential helmet size. Line plots containing a title, label, and scale are constructed using the data collected. The line plots will be used throughout all lessons to display, interpret, and analyze the data gathered from the investigations. Creating a line plot of the students' helmet sizes culminates this motivating activity.

NCTM Content Standard/National Science Education Standard:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them
- collect data using observations, surveys, and experiments
- represent data using tables and graphs such as line plots, bar graphs, and line graphs

Grade/Level:

4

Duration/Length:

3 days, 75-minute sessions

Student Outcomes:

Students will:

- Collect data by taking part in a variety of athletic activities
- Organize and display data to make line plots using a variety of categories and sets of data
- Calculate and describe the purposes of the mean, median, mode, and range.
- Analyze the distribution of data.

Materials and Resources:

Day 1

Outside:

- Numbered cones (1 per partner Yard Sticks or Tape Measures
- Numbered Footballs (1 per partner pair)
- A Starting Line (could be made using chalk, string, paper, ribbon...etc.)

- Clip-Boards for each partner group
- Data Recording Sheet (Student Resource 1)

Inside:

- Examples of graphs in real-life (newspapers, magazines, etc.)
- Poster board or chalkboard
- Masking tape
- *There's the Throw...the Catch...Touchdown!* (Student Resource 2) 2 per page
- *The Number of Touchdown Passes Completed...*(Student Resource 3) 2 per page
- Vocabulary cards for *gaps, clusters, range, line plot, and outlier* (Teacher Resource 1A-E)
- Football Cut-Outs (Teacher Resource 2)
- Markers
- *Line Plot Stats* (Teacher Resource 3)
- *Line Plot Stats* (Student Resource 4)
- Sample Graphs (Teacher Resource 4)
- *Uh Oh!* (Student Resource 5A and 5B)
- *Uh Oh!* (Teacher Resource 5A and 5B)

Day 2

Outside:

- Footballs (as many as possible)
- 2 goalposts (or anything that could be used as a reference point when kicking)
- Clip-Boards for each partner group
- Data Recording Sheet from Day 1 (Student Resource 1)
- stopwatch

Inside:

- *Tackle This* (Student Resource 6)
- *Tackle This* (Teacher Resource 6, Answer Key)
- Football Shoe Cut-Outs (Teacher Resource 7)
- Markers
- Masking tape
- Vocabulary Cards for the words *mode, median* (Teacher Resource 8A-B)
- Line plot from Day 1
- *Line Plots* (Student Resource 7)
- *Line Plots* (Teacher Resource 9)
- *Quarterback Quarrel* (Student Resource 8)
- *Quarterback Quarrel* (Teacher Resource 10)

Day 3

- *The Big Match Up* (Student Resource 9) Teacher must prepare ahead of time by cutting apart words and definitions
- Tape Measures
- Data Recording Sheet from Day 1 (Student Resource Sheet 1)

- Football Helmet Cut-Out (Teacher Resource 11)
- *Line Plot Stats* (Teacher Resource 3)
- *Line Plot Stats* (Student Resource 4)
- *Get Ready to Gear Up* (Student Resource 9)
- Summative Assessment, Blue 42, Blue 42, HIKE! (Student Resource 11A-B)

Development/Procedures:

Day 1

- Pre-assessment
 - Give half the class a paragraph containing a variety of football statistics from the previous year (Student Resource 2). Give the other students the same data shown in a line plot (Student Resource 3). Allow students a very brief amount of time to review the data and then pose the following questions aloud:
 - How many quarterbacks threw 2 touchdown passes? (2)
 - What was the greatest number of touchdown passes thrown by a quarterback in the 2008 season? (8)
 - How many quarterbacks threw 3 or more touchdown passes? (8)
 - Due to the nature of this activity, it is expected that those students with the information in graph form should be able to answer these questions more quickly. Begin a discussion as to why this occurred and help the students come to the conclusion that graphs allow us to interpret data easily. Ask students to describe or name the kinds of graphs they have seen in real life and what information these graphs displayed. Explain to students that they will be practicing the skill of passing today. Review with students the proper way to measure using a yard stick or tape measure.
- Engagement:
 - Tell the students that you are very excited for the start of football season. Ask students if they are looking forward to this and if so, describe the aspects of football that they enjoy. Begin to discuss the qualities that a great football player must possess. Students may list physical or emotional character traits on the board. With the students, circle the traits that are physical. You may add to this list, if necessary (include traits such as being a fast runner, excellent passer, good kicker, etc).
 - Tell the students that football players all across the country have been getting busy to improve their skills during their summer training camps. Inform students that over the next three days, they will have the opportunity to pretend that they are at Football Training Camp and will also have the chance to practice their skills. Before they can do this, tell students that it is important to look at some data and see how the players did last year.
- Exploration (*This will take place outside*)
 - Explain to students that they will be practicing their passing skills today.

- Review with students the proper way to use a yard stick or tape measure to measure to the nearest foot.
 - Have students predict how far (in feet) they think that they will be able to throw a football. They will record this number on the Data Recording Sheet (Student Resource 1).
 - Put students in numbered partner groups and assign each partner with an “A” or “B.” Explain that the “A” group will be the first group to practice their throws. Partner “A” will get a practice throw and the final throw that will be measured. The “B” group will be responsible for replacing a thrown football with a corresponding cone.
 - Once the exchange has take place, Partner “B” will assist Partner “A” in measuring the distance of the final throw to the nearest foot. Partner “B” will record the data on Data Recording Sheet (Student Resource 1A).
 - Then, partners will switch roles and repeat the procedure.
 - Once all data has been collected, the students will return to the classroom.
- Explanation
- Have students compare their passing predictions to their actual throws. Ask: Are you surprised by the difference between your prediction and actual throw? What was the actual difference between the two?
 - Remind students: Earlier we discussed how using a graph to represent data made it much more organized and easier to understand. You told me that you had seen a number of different graphs. Today, we will organize our data into a graph called a *line plot*. (the words, line plot, should then be displayed on the board Teacher Resource 1A).
 - Distribute the football cut- outs (Teacher Resource 2) to each student and have the students write the lengths of their passes listed on their data sheet (Student Resource 1) on the football with a marker.
 - Say: To create a line plot, you must first find the *range*. The vocabulary card for *range*-Teacher Resource 1B- should then be displayed on the board. Question students and ask students to define the word, range.)
 - Following a discussion, state or restate that to find the range we must first determine the largest and smallest numbers in our data. These numbers will tell us where we need to begin and end our number line.
 - Explain that sometimes there are professional football players that really need to improve when they first get to camp during the summer. Say: Is there anyone that feels they need more practice? Did anyone throw one foot? Two feet? Proceed with this process until the smallest measurement has been reached.
 - Ask the students: Does anyone feel ready for the football season? Did anyone reach seven feet? Continue until the largest measurement has been revealed.
 - Say: Now that we have found our largest and smallest measurements, it is time to find the range. Does anyone know how we can use these two numbers to find the range?” Once students have correctly stated that they must subtract the smaller number from the larger number, find the range together.

- Model the steps for preparing the line plot. Ask the students: What are some important elements of a line plot. As students list possible answers, reveal the information on *Line Plot Stats* (Teacher Resource 3) as they are stated. Be sure to mention the importance of equal interval spacing choosing an appropriate title, labeling the X axis, and making uniform X's or marks (in this case the students' individual footballs).
 - Say: Not everyone has the highest or lowest length, so what are some more data values we need to include on our line plot? Have students record their data on the chalk board.
 - One by one have the students place their football above the numbers that correspond to the length of their throws. As they do this, cross out the number that corresponds with the data on the board.
 - Ask students: Why was it important to write data down and then gradually cross them off as you place the x's on the plot? Based on responses, explain that it is important to guarantee all data is accurate and included in the line plot.
 - Once the line plot is completed have students analyze and discuss the data in groups and have them make general observations. Circulate throughout the room while this is occurring in order to assess student understanding.
 - Ask students if they notice any trends in the data. Gradually, introduce the terms outliers, clusters and gaps. Say: Sometimes some pieces of data are very different from the others and sit all by themselves on the number line, far away from the others. We call this an *outlier*. Does anyone see an outlier? Display a vocabulary card with the word, outlier, on the board (Teacher Resource 1A).
 - Say: When we have spaces between our data we call these *gaps*, but other times our data is very similar and grouped together closely on a line plot. We call this a *cluster*. Display these two vocabulary words on the board and ask students to identify gaps or clusters in the data set.
- Application
- Use the following questions to guide the discussion. Pose the questions aloud and allow the students time to discuss their thoughts in small groups. Circulate to note understandings.
 - What does the line plot tell us about our class?
 - If you were the coach of our imaginary football team, how could you use the outliers to help you make team decisions? (This could show students who might need extra practice and be the back-ups and identify students whose throwing ability is more advanced and could be a game starter.)
 - What does the cluster of data tell you? (Many students are able to throw the ball in this range.)
 - Based on the graph, how many students do you think would be ready for the start of football season?
 - How many students still appear to need a bit of practice before the season starts?
 - How could you find the total number of students who participated in this activity?(Count the number of footballs.)

- Discuss responses with the whole class.
- Display the sample graphs worksheet, which can be made into an overhead (Teacher Resource 4) and pose the following questions:
 - How many students were surveyed? (Unit 1: 20 Unit 2:16) How do you know? (the number of x's represent students)
 - How many students scored *at least* a/an _____?
 - Where does the data gap? Are there any outliers? (Test 1: between 95 and 100; Test 2: between 50 and 60 and 70 and 90; Test 1: 100; Test 2: no outliers)
 - If you were the teacher, would you give a retest? Why or why not?
- Differentiation
 - Reteach
Provide those students who appear to need additional support with an individual copy of the *Line Plot Stats* (Student Resource 4) to use during the application and for the exit ticket.
 - Enrich
The exit ticket has been modified to meet their needs (Student Resource 5b). Higher level students are required to write a note in which they give specific recommendations as to what can be done to correct the work. In addition, they are asked to predict what this graph could represent.
- Assessment
 - Students will be given an exit ticket, *Uh Oh!*, which contains a line plot that is missing important elements. Students will be asked to identify any errors and make the proper corrections on the line plot (Student Resource 5A and 5B). Answers can be found on Teacher Resource 5A and 5B.

Please note- Be certain to save the line plot that was created today because this will be used for Day 2 Explanation. Also, students will need the data sheet for all three days.

Day 2

- Engagement
 - With partners, students will match the correct vocabulary word with its location on *Tackle This* (Student Resource Sheet 6). They will be asked to label the line plot's title, and identify any clusters, gaps, or outliers in the data. In addition, they will be asked to circle the numbers that are needed to determine the range and then find it.

- Circulate as the students work. Review as a whole class and refer to the line plot that was created yesterday as a quick review, if needed. Answer key can be found on Teacher Resource 6.
- Exploration (this will take place outside)
 - With students, revisit the physical traits that they said a professional football player needs. Tell students that today, they are going to practice a very important skill, being able to kick a football through the goal post (You may opt to create a goalpost that is more appropriate for the needs of your students).
 - Have the students predict how many footballs they think they will be able to kick over the goalpost and record this on their data sheet (Student Resource 1). Students can then share their predictions.
 - Ask students if they can expect to see the same trends as yesterday. Some students may be natural athletes and will perform well in all athletic activities, while others are not as athletic. However, kicking and throwing are not related so we may see differences.
 - The students will be taking turns kicking as many footballs as they can in 45 seconds over a goalpost. Students will be with the same partner as yesterday. While one student kicks, the other will record on the data sheet the number of footballs that go over the goal post. Time the students as they complete this activity.
 - After 45 seconds, students will switch roles and repeat the same procedure.
 - Remind students to record all findings on their data sheets and then return to the classroom.
- Explanation
 - Have students compare their number of successful kicks with their group members. Have them briefly discuss if they think that there are any outliers among their data. Circulate throughout the classroom to note understandings.
 - Give students a football shoe cut-out (Teacher Resource 7) and marker to record the number of successful kicks that they had.
 - Tell students: Yesterday, we analyzed our data by noting where there were clusters and gaps. We also looked for any outliers. What if I wanted to know how most students did? How could I determine this? (by noting the most repeated data points). This number is called the *mode*. (Display this vocabulary card, Teacher Resource 8A).
 - Using the line plot from Day 1, have the students respond to the following discussion:
 - What is the mode of our data? What does this tell us?
 - If the mode is _____, where did your data fall?
 - Would you be in the cluster or an outlier? How could this information be helpful to a football coach if this was his team's data?
 - Tell the students that while the mode is helpful to note, it doesn't always tell us everything we need to know. Ask the question: "Imagine if 9 of our _____ total students kicked the football only 2 feet. Should the football coach assume that he needs to reteach this skill to his players since that was the mode?"(No, the

majority of the students could have kicked the ball much farther, even though the mode was only 2).

- Tell students that sometimes, we need to find the middle number of our data set, which is called the *median* (place this vocabulary card on display, Teacher Resource 8B). Demonstrate this by having the student with the smallest and largest amount of kicks stand on either side of the room. Have the other students stand in between them in order from smallest to largest. Have the students on the ends sit down and continue to have the students that are the very last in line sit down. Continue this until only one student is remaining. This is the median.
 - If there is an even amount of students, help them to determine that the median is the number that falls exactly between them.
 - Collect the students' football shoe cut-outs and display them on the board. You may use masking tape or put magnets on the back in advance, if you prefer.
 - Tell students that today, they are going to see how the mode and median relate to the data that they collected yesterday.
 - *This portion of the lesson should move quickly, as it is a review from yesterday.* With the class, label the start and end points of the line plot. Determine the range.
 - Say: Together, we can determine the intervals we should use for the line plot based on the data collected (you will most likely count by 1's).
 - Choose a title for the line plot and a label for the X-axis.
 - Once this is complete, have the students identify what the mode of their data again. Explain that sometimes, there may not be a mode or more than one number will be the mode.
 - The students will already have found the median but model how to determine this using the line plot.
- Application
 - Review as a class how the clusters, outliers, mode, and median could help a coach when making decisions about his football team. Use the following questions as students refer to the line plot:
 - Which measure represents the more typical amounts of kicks our class can get through the goalposts? (median because it considers the ability of all students in the class)
 - Imagine if two more students were added to our class and they were able to kick ____ footballs through the goalpost. How might this change our data? Try to select a number that would change the data set.
 - Give students *Line Plots* (Student Resource 7). Circulate the classroom to note their understandings. You may pull a small group at this time, if needed. Answer key can be found on Teacher Resource 9.
 - Differentiation
 - Reteach

During the exploration, you may consider pairing up students of lower ability with higher ability students. Students who demonstrated the need for extra help based on yesterday's exit ticket may also be given further assistance during application time. In addition, a quick review of yesterday's learning was included in the beginning of the explanation. Reading assistance can be provided for the exit ticket, if necessary.

- Enrich
Students may complete the Challenge question on the *Line Plots* sheet (Student Resource 7).
- Assessment
Students will complete *Quarterback Quarrel* (Student Resource 8) in which they are asked to analyze given data and find the mode and the median after adding the missing data. Answer key can be found on Teacher Resource 10.

Day 3

- Engagement
Review the past two day's vocabulary by playing *The Big Match Up* (Student Resource 9). You will need to prepare the game in advance of the lesson. Each partner group should have one set of cards. Half of these cards contain a vocabulary word and the other half contains the definitions of these words. To play, students will take turns selecting two of the facedown cards from the stack. If the vocabulary card and its matching definition are selected, students may collect them and take another turn. If they do not match, the opponents take their turns. The game ends when all of the cards have been collected and the winner is the student with the most cards. Review the correct vocabulary matches at the end of the game.
- Exploration
 - Tell students that based on their great football skills, they all made the team. However, before they can play, the coach will need to order their football helmets and must know what size they wear.
 - Quickly review with students how to use the measuring tape to measure to the nearest inch. Model how to use this measuring tape to measure the circumference of one's head.
 - With partners, students will take turns measuring their heads and recording the measurement on their data sheet (Student Resource 1). Circulate the room during this activity to ensure that they are measuring correctly.
 - Students will record their measurement on the Football Helmet Cut-Out (Teacher Resource 11).
- Explanation
 - Inform students that today, they will be applying what they have learned about constructing and analyzing line plots to create one with their groups. Remind

them that there are responsible for including all of the necessary elements that have been discussed in previous lessons.

- Application
 - In their groups, have students use the data that they collected when they measured their heads to create a line plot on *Get Ready to Gear Up* (Student Resource 10).
 - Make sure that the large copy *Line Plot Stats* (Teacher Resource 3) and the vocabulary words are posted somewhere in the classroom for extra support. In addition, it will be helpful to have the line plots that were created on days 1 and 2 posted in the classroom for guidance.
 - Circulate the classroom and monitor students as they work and note their understandings. If needed, you may pull a small group to work with during this time.
 - Discuss and share the line plots. Display these on the board or a bulletin board. Use the following questions to guide the conversation:
 - What trends do you notice across all of the line plots?
 - Which group had the largest range? What does this tell you about this group? Look at each group's median. How do they compare? What conclusions, if any, can we draw based on this data?
 - Following this discussion, have students place their helmet cut-outs on the board. These can be taped using masking tape or you can have magnets attached ahead of time.
- Differentiation
 - Reteach

In the application, have students of varying ability levels work together. To help students with the creation of their line plot in the application, the vocabulary words will be posted for reference. In addition, the line plots that were created on days 1 and 2 should remain on display for additional support. If needed, time is allotted during the application time to work with a small group of students. For the summative assessment, students will be permitted to refer to the checklist (Student Resource 4) to help them complete their line plots.
 - Enrich

An additional challenge problem has been provided on the summative assessment. In addition, you may ask questions that require higher-level thinking during class discussions and as you monitor the students while they work.

Summative Assessment:

Using the helmet cut-outs that the students placed on the board, the students will construct a line plot. Students will be required to include the necessary components, including the title, equal intervals, the lowest and highest numbers of data represented as the endpoints

of the plot, equal sized X's, and a label for the X-axis (Student Resource 11A-B). After constructing this line plot, students will be asked to identify the mode, median, range, gaps, clusters, and outliers. They will be asked to answer a question about this data after analyzing it.

The final question on the assessment is a challenge problem and can be used if appropriate for the students.

Please note: No key for the summative assessment has been created, as the data collected will be different for each class.

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Data Recording Sheet

<h1>Passing</h1> 	<h1>Kicking</h1> 	<h1>Helmet Size</h1> 
<p>Prediction:</p>	<p>Prediction:</p>	<p>Prediction:</p>
<p>Actual Measurement:</p>	<p>Actual Number:</p>	<p>Actual Measurement:</p>

Data Recording Sheet

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<p>Prediction:</p>	<p>Prediction:</p>	<p>Prediction:</p>
<p>Actual Measurement:</p>	<p>Actual Number:</p>	<p>Actual Measurement:</p>



There's The Throw...The Catch...TOUCHDOWN!

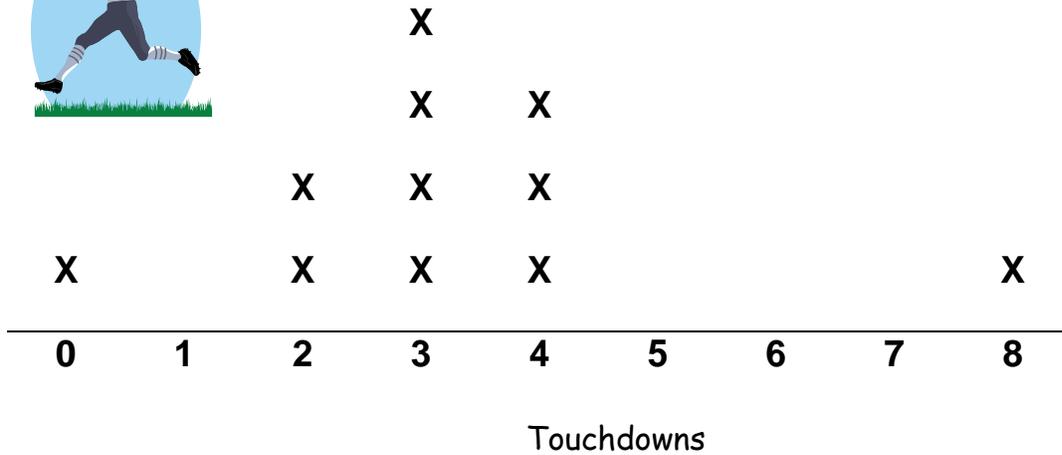
Many famous professional football players have had great success with throwing the football to another player for a touchdown. Ima Starr, who played for the National Nachos, in one season, had 4 touchdown passes. Blaze Inrunner also had 4 touchdown passes. Ed Money and Cinco Ocho had 2 touchdown passes each, while Mucho Yards and Fam Maning had 3 touchdown passes. Mucho's little brother, Grande Yards, had 4 touchdown passes. Tic Tackle and Line Backer tallied in with 3 touchdown passes a piece. Jack Slacker had a little trouble this season and had 0 touchdown passes. It was King Throwdown that shocked and amazed fans with 8 completed touchdown passes this season for the Towson Trolls.



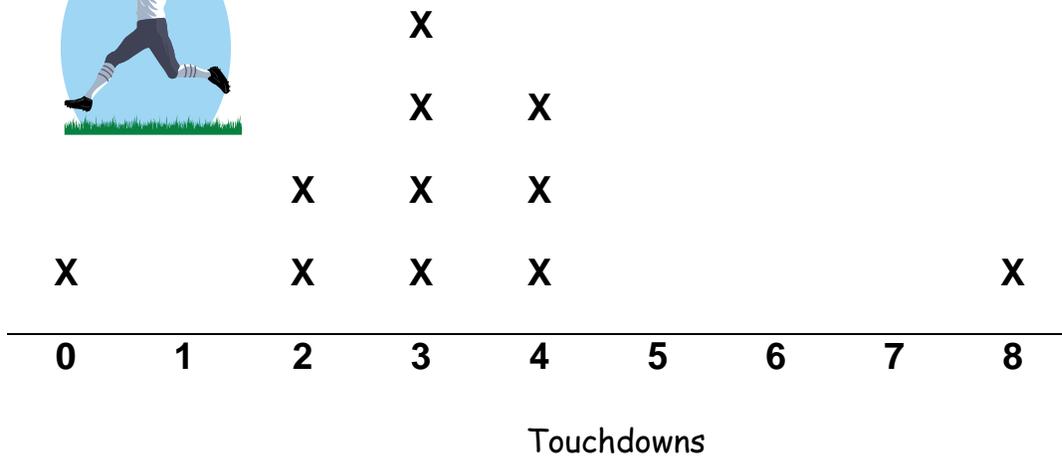
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Number of Touchdown Passes Completed By Professional Players



Number of Touchdown Passes Completed By Professional Players





Line Plot Stats!

Just like your favorite football players have stats, so should your line plot!

Make sure you don't forget:

- ★ A title
- ★ Equal spacing between the numbers
- ★ X's or marks that are the same size
- ★ Every piece of data



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Name: _____

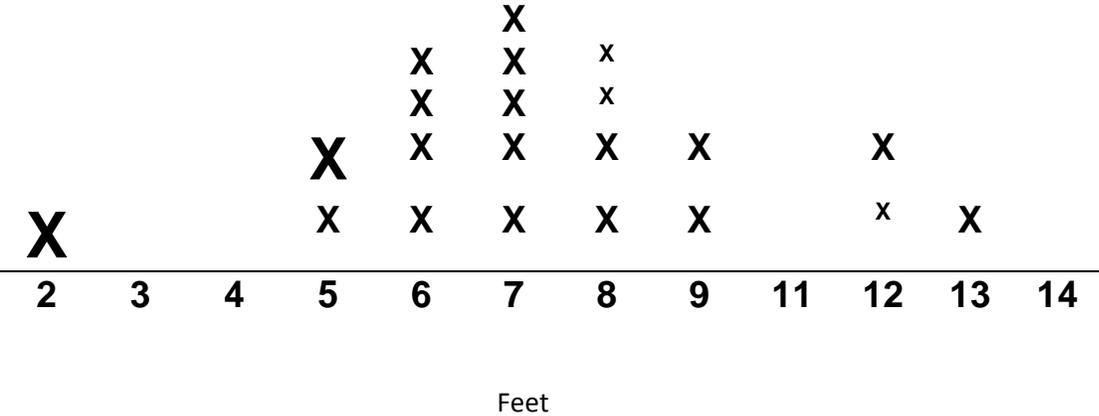
Date: _____

Uh Oh!



Your best friend collected data and represented the data in the line plot below. However, she was in a hurry and made some mistakes.

*Uh oh! Can you help her by listing the **FOUR** things that she needs to do to correct her line plot?*



1. _____
2. _____
3. _____
4. _____

Name: _____

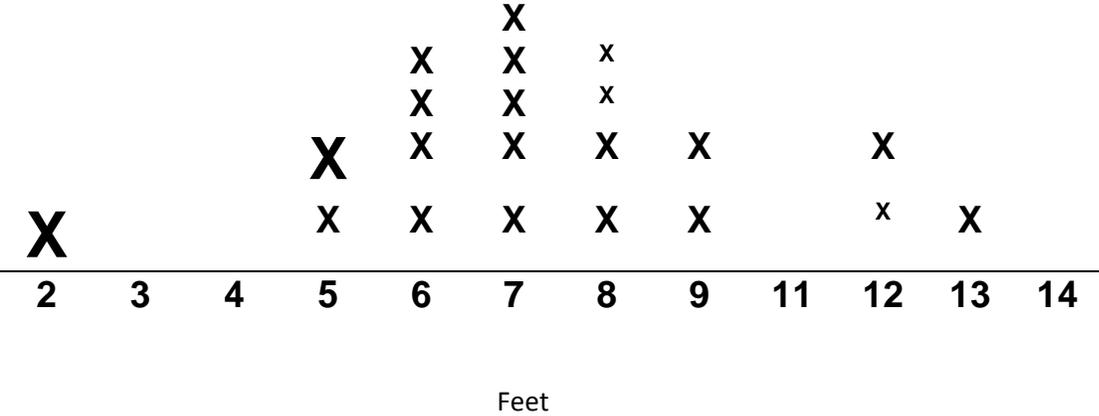
Date: _____

Uh Oh!



Your best friend collected data and represented the data in the line plot below. However, she was in a hurry and made several mistakes.

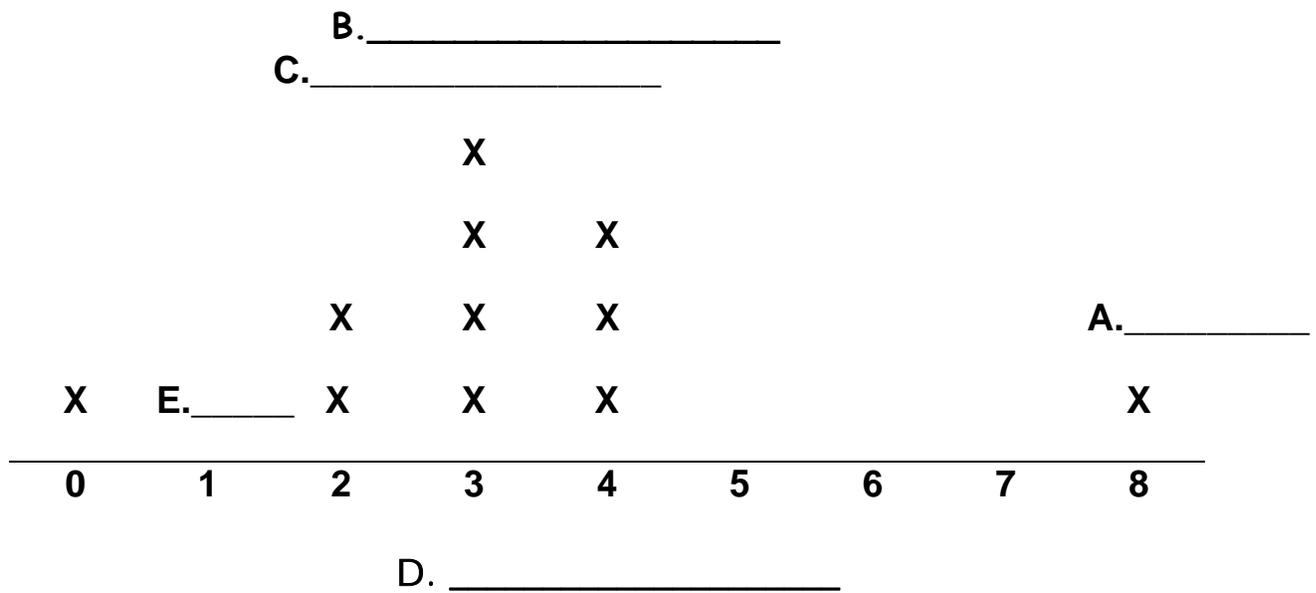
Uh oh! *On the lines below, write a brief note to your best friend, indicating what they did wrong and what needs to be corrected so that the line plot is accurate.*



Dear _____,



Directions: This line plot is missing some important elements. Below is a list of items that are missing from the graph or items that you need to label. Work with your group and write the elements on the line where it should be located on the line plot. Also, complete the last question on this sheet.



Word Box:

Title	Outlier
Gap	Cluster
Label	

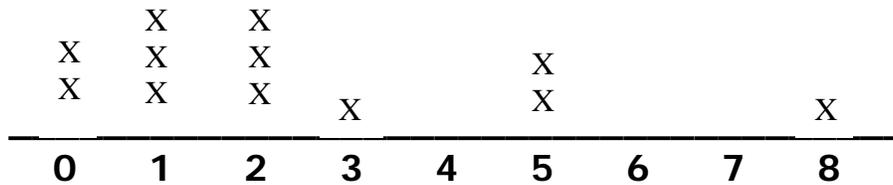
Final Countdown Challenge:

Circle the two numbers on the line plot that will assist you in finding the range of data. On the lines below find the range for this line plot. Show your work.

Line Plots



Number of Pencils in Students' Lockers



Number of Pencils

1. What is the range of the data on the line plot? _____
2. How many pencils do most students have in their locker? _____
3. What is the median of the data on the line plot? _____
4. How many students have at least 3 pencils in their lockers? _____
5. Imagine that the range of the data was 10. What two numbers could be at the endpoints of this line graph? Explain.

Challenge! *Imagine that the students with zero pencils were each given 3 pencils. Draw what this line plot would now look like. On the back, explain how this would change your data.*



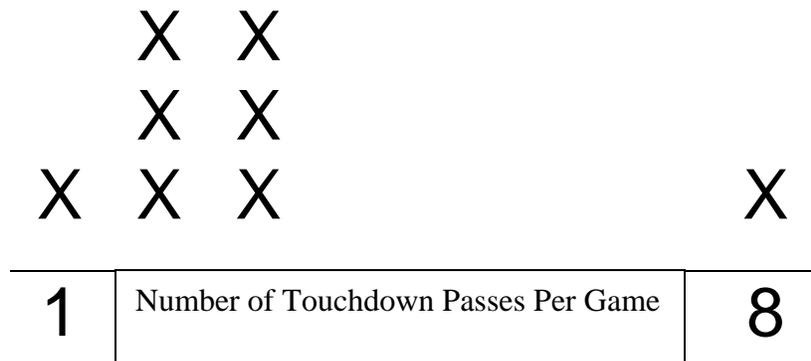


Quarterback Quarrel!

The water boy on the sidelines was taking the passing stats for the quarterback throughout the season. He recorded the data provided in the line plot. After the season, the quarterback notices there were only 8 X's and there should be 11! The angry quarterback marched up to the water boy and demanded the stats from the missing three games. The trembling water boy found the stats and added them to the line plot. It is your job to help the water boy add the data to the line plot.

Missing Stats: 4, 6, 2

Number of Touchdown Passes Made Each Game by the Quarterback
--



Find the mode for the new data set: _____

Find the median for the new data set: _____

The Big Match Up

Line Plot	<i>a graph that organizes a small range of data on a number line segment.</i>
Range	the distance between the largest and smallest number in a data set.
Outlier	Points that lie distant from the rest of the data.
Cluster	Areas where data piles up over groups of numbers.
Gap	Spaces between clusters.
Median	The number in the middle of a set of data.
Mode	The number that occurs the most within a data set.

Get Ready to Gear Up!

Directions: Use the helmet data collected within your group to form a line plot. Remember all of the important line plot stats. Below is the checklist to remind you of all the valuable information that **MUST** be represented on the line plot.



Line Plot Stats!

Just like your favorite football players have stats, so should your line plot!

Make sure you don't forget:



A title



Equal spacing between the numbers



X's or marks that are the same size



Every piece of data



Blue 42, Blue 42, HIKE!

You and your team have been tackling line plots over the last three days. Now, it is your chance to score the winning touchdown and demonstrate what you have learned. Answer the following questions to the best of your ability. Don't forget to answer the field goal (bonus) question at the end.

1. Use a line plot to show the helmet measurement data on the board. Don't forget to include all of the line plot stats!

2. Please find the line plot stats below:

Range= _____

Mode= _____

Median= _____

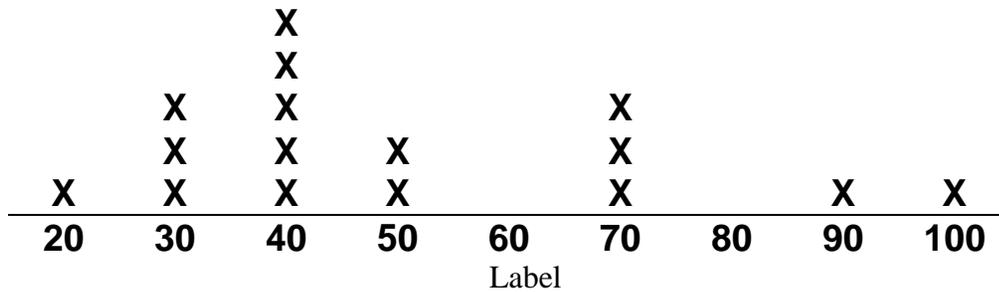
3. Now, look at your line plot, do you notice any of the data "piling up" close together? What is that called? Why might this have occurred?



You are the team manager and the coach has asked you to purchase new helmets for the season. Based on the information in the line plot, what is the typical size of a player's head on the team? How does your head measurement compare to it?

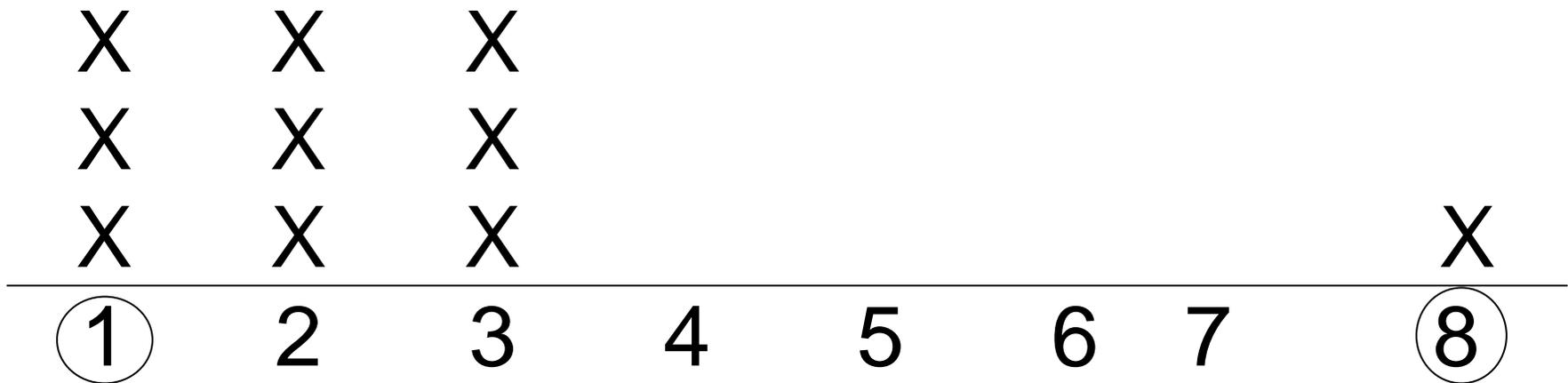
Line plot: *a graph that organizes a range of data on a number line segment.*

Title



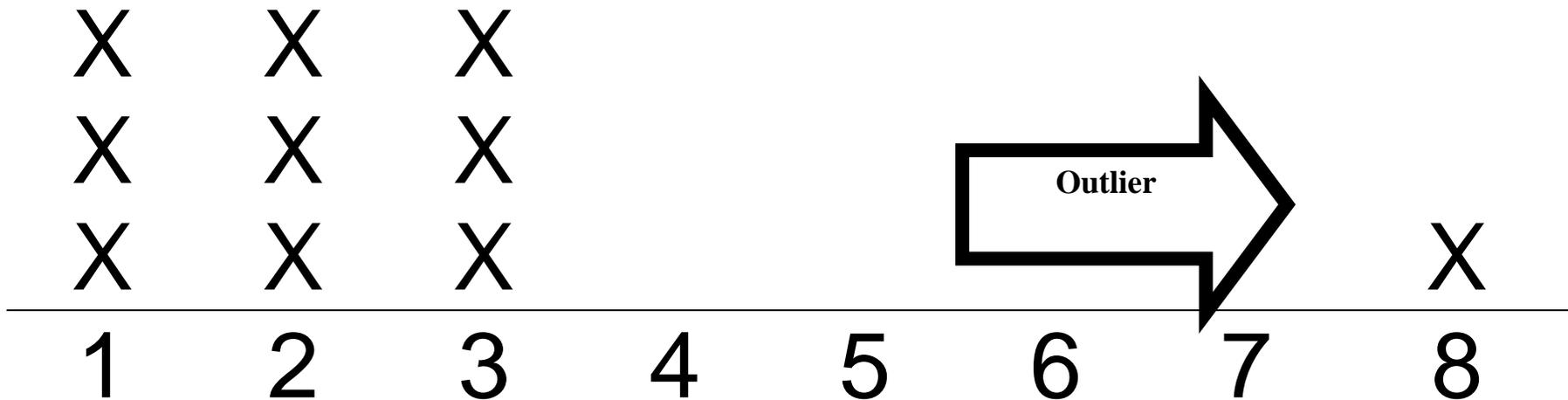
Range: the distance between the largest and smallest number in a data set. To find the range in data, subtract the smallest number from the largest number.

Title

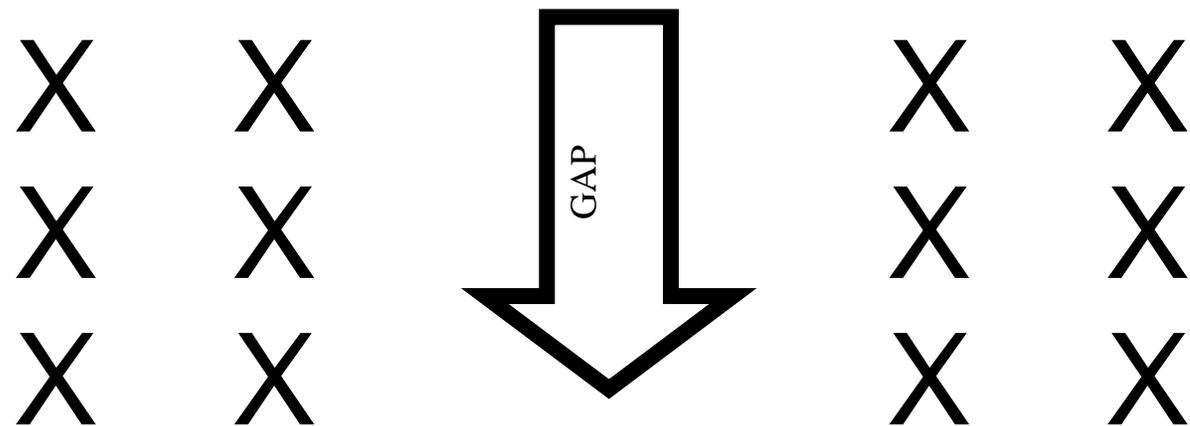


$8-1=7$
7 is the range of data.

Outliers: Points that lie distant from the rest of the data.

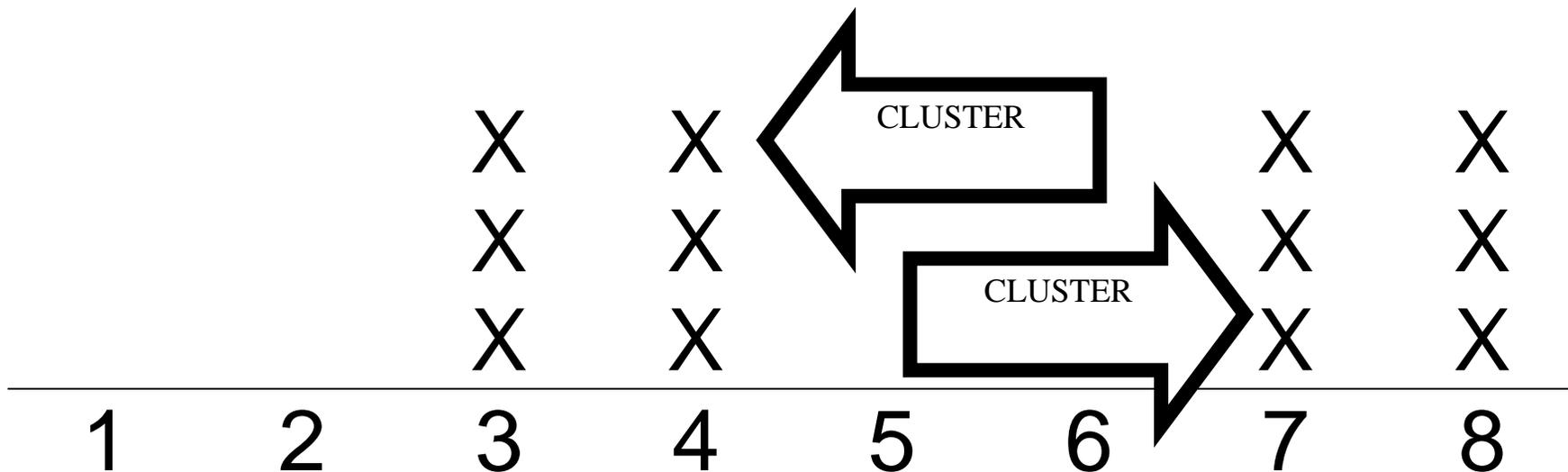


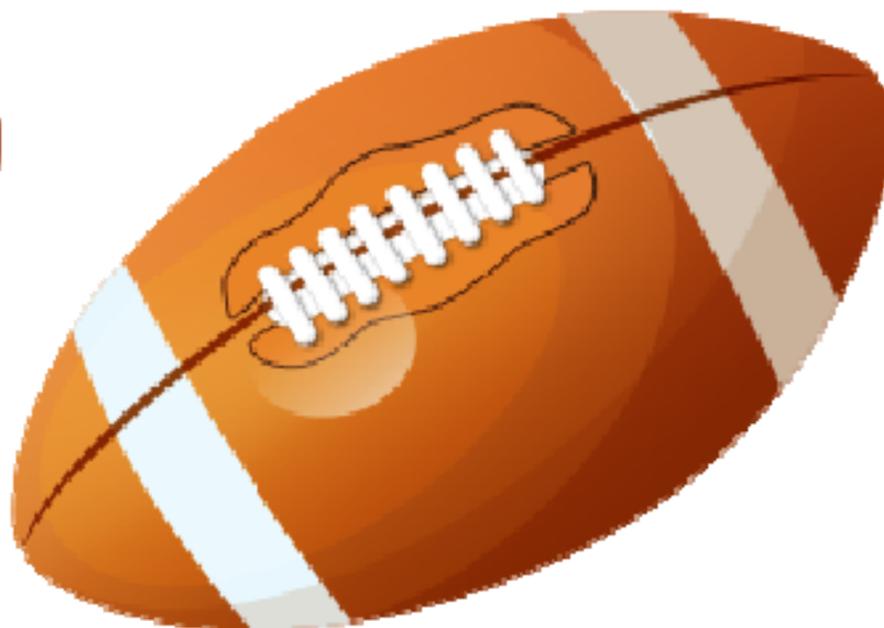
Gaps: Spaces between clusters.



1 2 3 4 5 6 7 8

Clusters: Areas where data piles up over groups of numbers.







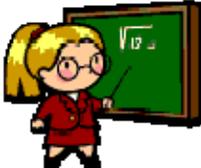
Line Plot Stats!



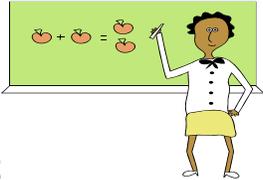
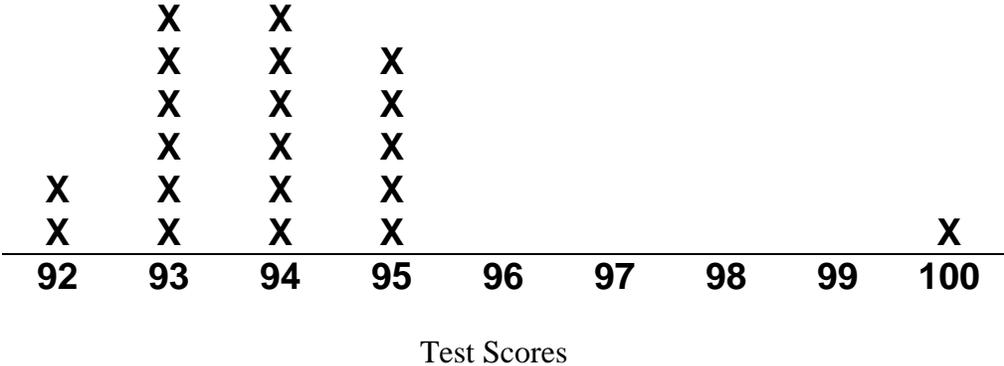
Just like your favorite football players have stats, so should your line plot!

Make sure you don't forget:

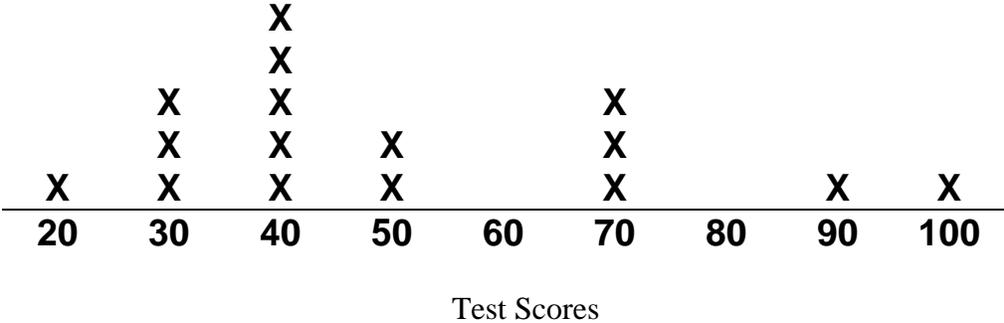
- ☆ A title
- ☆ Equal spacing between the numbers
- ☆ X's or marks that are the same size
- ☆ Every piece of data



Scores on Unit 1 Math Assessment



Scores on Unit 2 Math Assessment



Name: _____

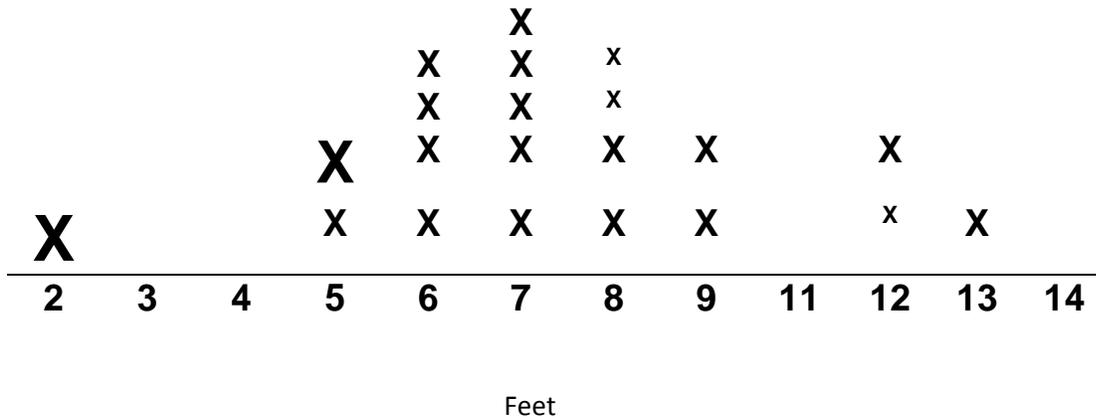
Date: _____

Uh Oh!



Your best friend collected data and represented the data in the line plot below. However, she was in a hurry and made several mistakes.

Uh oh! *On the lines below, write a brief note to your best friend, indicating what they did wrong and what needs to be corrected so that the line plot is accurate.*



Dear Friend,

There are several things wrong with your line plot. First, a line plot must include a title and yours is missing. Next, the X's should all be the same size. Also, a line plot must represent the data using equal intervals and you did not include the number 10. Finally, you need a label to show what the numbers represent.

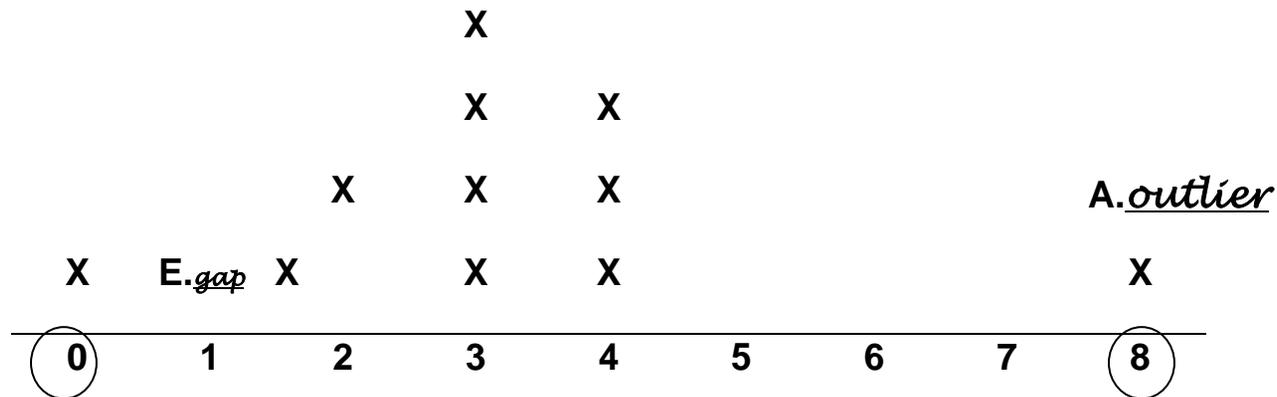
* 1 point is awarded for each correction mentioned, for a total of 4 possible points.

Tackle This!

Directions: This line plot is missing some important elements. Below is a list of items that are missing from the graph or items that you need to label. Work with your group and write the elements on the line where it should be located on the line plot. Also, complete the last question on the sheet.

B. Title

C. Cluster



D. label

Word Box:

Title	Outlier
Gap	Cluster
Label	

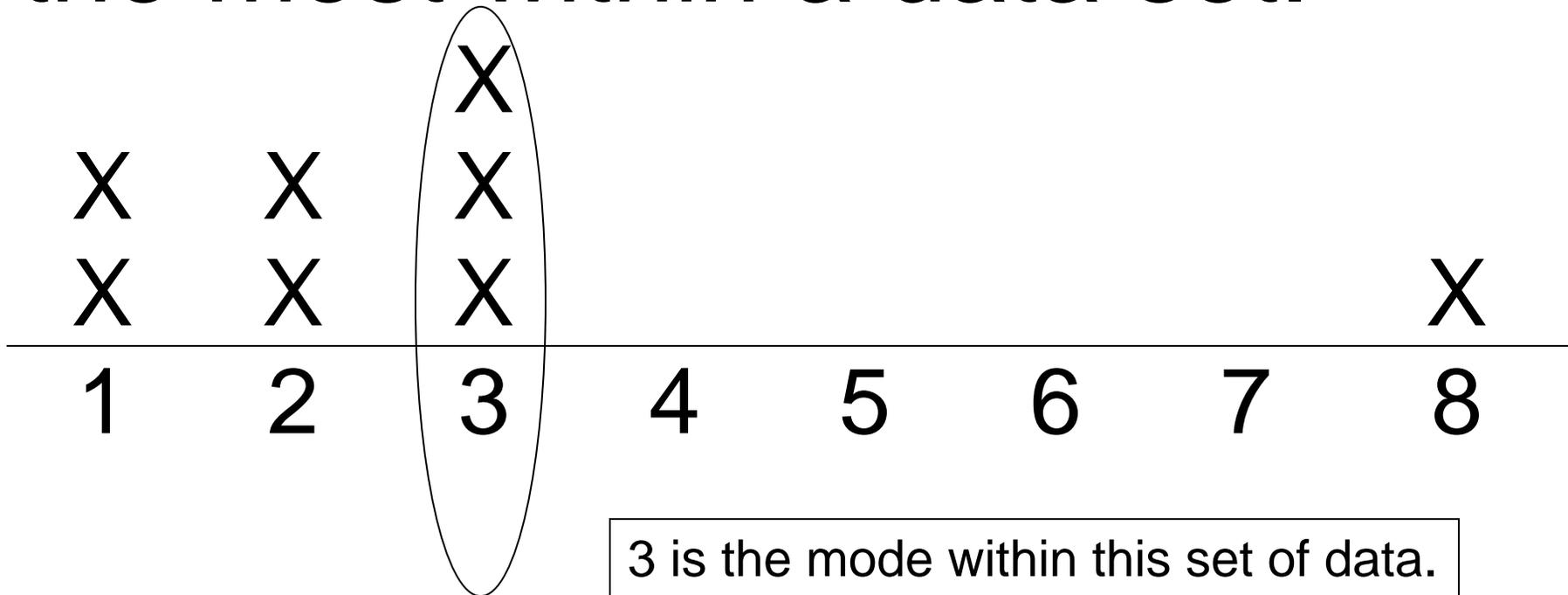
Final Countdown Challenge:

Circle the two numbers on the line plot that will assist you in finding the range of data. On the lines below find the range for this line plot. Show your work.

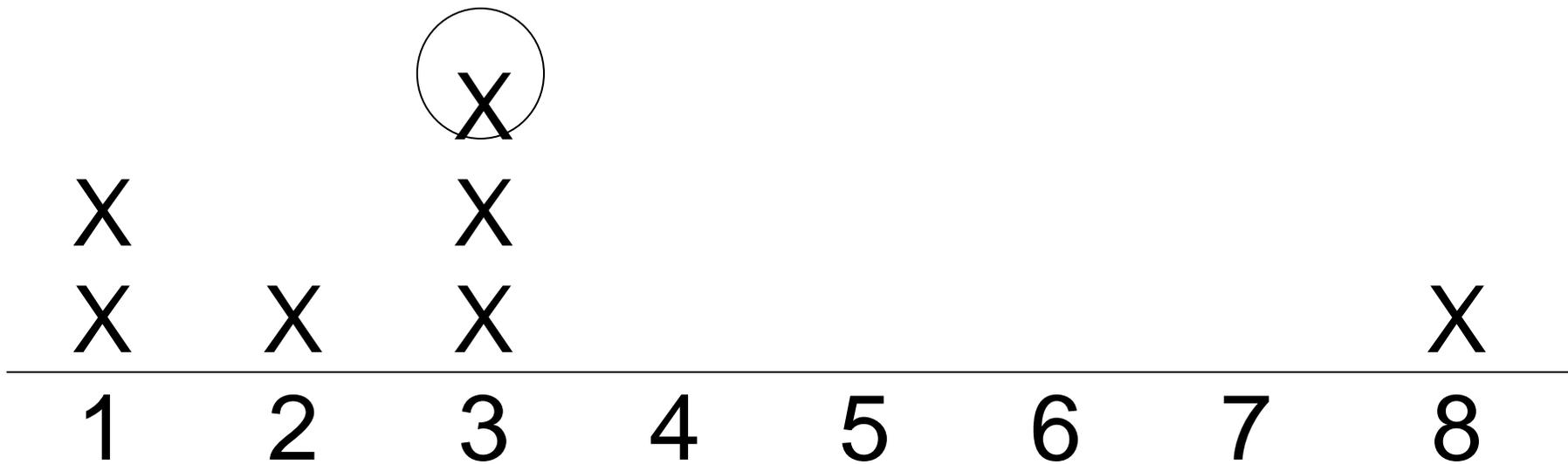
$$8 - 0 = 8$$



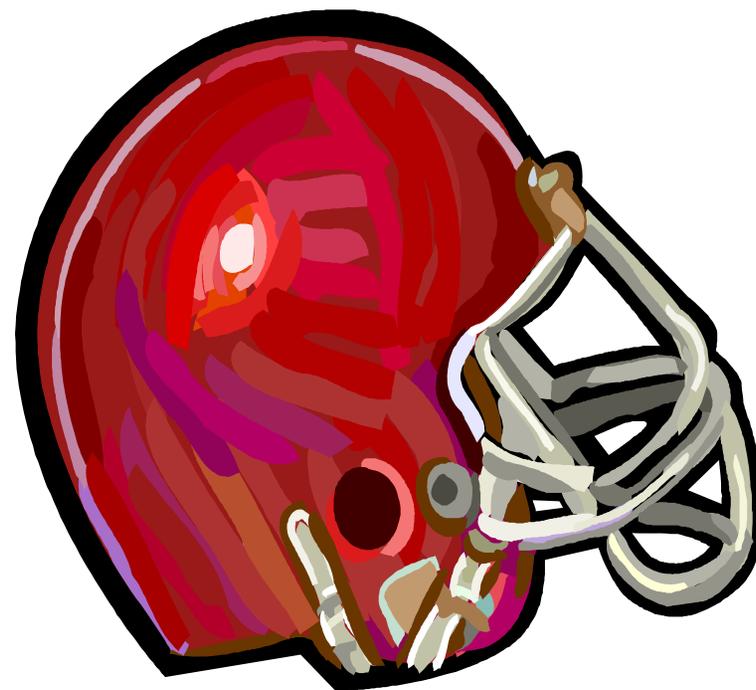
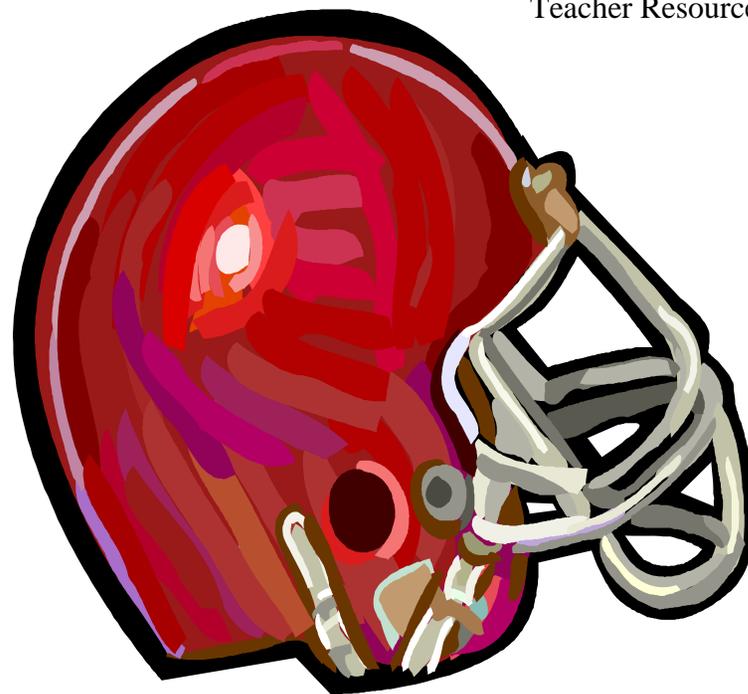
Mode: The number that occurs the most within a data set.



Median: The number in the middle of a set of data.



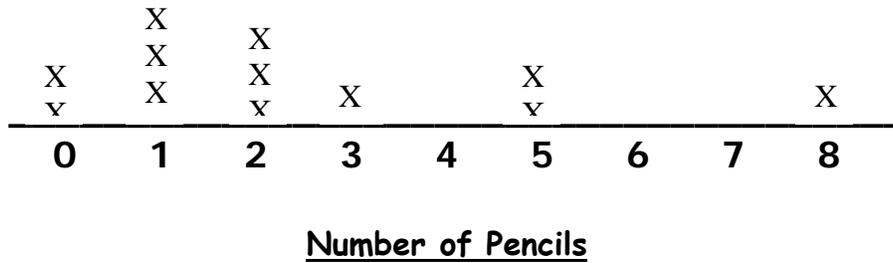
3 is the median within this set of data.



Line Plots



Number of Pencils in Student's Lockers



1. What is the range of the data on the line plot? 8
2. How many pencils do most students have in their locker? 1
3. What is the median of the data on the line plot? 2
4. How many students have at least 3 pencils in their lockers? 4
5. Imagine that the range of the data was 10. What two numbers could be at the endpoints of this line graph? Explain. One example could be 0 and 10 because I know that the range is found by subtracted the smallest piece of data from the largest. $10 - 0 = 10$.



Challenge! *Imagine that the students with zero pencils were each given 3 pencils. Draw what this line plot would now look like. On the back, explain how this would change your data.*

