Let's Get Physical!

Brief Overview:

Organizing data on different types of graphs can help students to easily analyze the information that they have collected. Using line plots and stem and leaf plots are two ways to show numerical data. These lessons will help students understand how to create and interpret both types of graphs and also how to choose the more appropriate visual representation for a particular data set.

NCTM Content Standard/National Science Education Standard:

1. 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.
2. Select and use appropriate statistical methods to analyze data:
   • Describe the shape and important features of a set of data and compare related data sets with an emphasis on how the data are distributed;
   • Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set.

Grade/Level:

Grades 3-5

Duration/Length:

3 days (60 minutes each day)

Student Outcomes:

Students will:
• Learn to find measures of center (median, mean, mode) in order to analyze a set of data.
• Collect data and create a line plot in order to graphically display their results.
• Collect data and create a stem and leaf plot in order to graphically display their results.

Materials and Resources:

Lesson 1
• Teacher Resource 1 –Favorite Sports Bar Graph (on transparency)
• Box of Cheerios
• Cereal bowls (one per team of 3 students)
• Supply bag with 3 spoons, 10 marshmallows, and 10 coffee stirrers, a marker, and 3 index cards (one per team of 3 students)
• Student Resource 1 –Cheerio Fun! (one per student)
• Masking tape
• Bags of stackable items: 2-color counters, nickels, etc. (one per team of 3 students)
• Student Resource 2-Extend Your Thinking: Money Found Under Grandma’s Couch (one per student participating in this group)

Lesson 2
• Teacher Resource 1-Times of a 50-Meter Dash (on transparency)
• Student Resource 3-How Fit Are We? (one per student)
• Timer
• Student Resource 4-Star Shooters (one per student)
• Student Resource 5-Extend Your Thinking: Are We Physically Fit? (one per student participating in this group)

Lesson 3
• Jump ropes (1 per pair – see your physical education teacher)
• Timer
• Student Resource 6- A Hop, Skip, and a Jump Rope (one per student)
• Teacher Resource 5-How Do We Measure Up? (on transparency)
Development/Procedures:

Lesson 1

Pre-Assessment

• Display a bar graph depicting the favorite sports of students in the class. (Use Teacher Resource 1 on transparency or data collected from previous lesson.)
• Key Question: How many more people like football (or most popular choice) than baseball (or least popular choice)? Discuss - How did you find your answer?
• Key Question: What is the most popular sport in our class? Discuss - How did you know this? How might we use this information?
• Ask students to arrange the data from least popular to most popular. Key Question: Which sport is not the most popular or the least popular, but somewhere in the middle? Discuss - How did you know this? How might we use this information?
• Informally assess students' background knowledge of interpreting data from a graph.

Launch

• Ask students: What is the most important meal of the day? Breakfast.
• Ask students: Which cereal would be the most healthy way to start your day: Frosted Flakes, Cocoa Puffs, or Cheerios? (Cheerios.) Why? (It doesn't have as much sugar in it.)
• Pour a box of Cheerios into cereal bowls (one per group of students). Distribute a bag with the following materials: plastic spoon, marshmallow, and coffee stirrer to each student.
• Ask students: How many Cheerios do you think you eat in one spoonful? Have students make an estimate and record it on Student Resource 1 - Cheerio Fun!

Teacher Facilitation

• Have each student take three spoonfuls of Cheerios, place in "bowls" on recording sheet, and count the actual number of "o's" in each spoonful. Students should record their own numbers as well as the numbers of the other members on their team.
• Direct students to create a 3-dimensional bar graph by following the directions:
  1. Construct a base for the bar by sticking the coffee stirrer into the top of the marshmallow.
  2. Place all Cheerios from one spoonful onto the stirrer, one on top of the other.
  3. Construct a base and bar for the other two spoonfuls.
  4. Line up all stacks from the group along the horizontal axis (masking tape) from least to greatest.
  5. Label each stack with the students' names by writing on the masking tape.
  6. Create a scale by stacking Cheerios on an extra stirrer. Stack 5 Cheerios, then a paper clip, 5 more Cheerios, a paper clip, etc.
  7. Place the scale on the left of the other stacks to create a vertical axis.
  8. Use index cards to create labels for both axes and the title.

• Once the 3-D bar graph is constructed, direct students to discuss the questions on Student Resource 1 as a team.

• Introduce the terms mean, median, mode, and range. Help students understand the meaning of each term while manipulating the bar graph to find the mean, median, mode, and range.
  o Range: What was the most number of Cheerios a student had in a spoonful? What was the least? What is the difference?
  o Mode: What number of Cheerios occurred the most frequently?
  o Median: What was the middle number of your spoonfuls?
  o Mean: What if you want to find the typical amount of a spoonful? What could you do to the stacks? Direct students to even out the stacks so that they all are the same height. About how many Cheerios are in each stack?

**Student Application**
• Distribute bags of 2-color counters, nickels, pennies, etc. to each team.
• Have student teams follow the directions to complete the 3-D graphing activity in their teams.
• Direct students to discuss questions together.
Embedded Assessment

- Regroup as a whole class. Review new vocabulary.
- Complete Student Resource 2. Answer key can be found on Teacher Resource 2.

Reteaching/Extension

- Reteaching - In small group, repeat procedure to make 3-D graph using stacking cubes.
- Extension - Using the same data from above, add a key that makes the value of each counter (or other item) more than 1. Example: If each counter is worth 5, how much is each stack worth? What is the range? Why did it change? (See Student Resource 2)

Lesson 2

Pre-Assessment

- Given the line plot on Teacher Resource 1 (Times of a 50-Meter Dash), have the students find the mean, median, mode, and range. Discuss as a class. Show visually on a transparency.

Launch

- Display bar graph Teacher Resource 1 (Favorite Sports) and compare with today’s line plot. Students should be able to recognize similarities and differences. For example: difference between the X-axis (categorical versus numerical labels)
- Explain the meaning of a line plot and when it is used. For example: a line plot is a graph that is a piece of a number line. It is used when the range of the data is small.
- Explain to the students that we will be doing some exercises in math today.

Teacher Facilitation

- Divide students into pairs.
- Assign each student a letter (A or B).
• Explain roles of each teammate. While A is exercising, B is counting the number of sit-ups and he or she records the final number on Student Resource 3. Then, alternate roles.
• Teacher times one minute while A’s do sit ups. Repeat for the B’s. ***Do the activity in a safe part of the room or outside if weather permits.
• Direct students to return to their seat to collect data as a class.
• Record data as a class.
• Analyze data and discuss how to start the line plot.
  o Do we need to start at zero? Why or why not?
  o How far do we extend the number line?
  o What symbol can we use to show each data point?
  o What would be a good title of our line plot?
  o How would we label the X-axis?
• Model the construction of a line plot.
• Analyze and interpret the line plot.
• Discuss the following terms: outlier, gap, and cluster.

Student Application
• Divide students into pairs (same pairs as above).
• Review roles of each teammate. While A is exercising, B is counting the number of toe touches (hands up to sky and down to waist, toes back up to waist=1 toe touch) and he or she records the final number on Student Resource 3. Then, alternate roles.
• Teacher times one minute while A’s do toe touches. Repeat for the B’s. ***Do activity in a safe part of the room or outside if weather permits.
• Record data from each student
• Analyze data and discuss how to start the line plot.
  o Do we need to start at zero? Why or why not?
  o How far do we extend the number line?
  o What symbol can we use to show each data point?
  o What would be a good title of our line plot?
  o How would we label the X-axis?
• Construct line plot and answer questions with a partner on Student Resource 3
Embedded Assessment
- Have students complete Student Resource 4. Answer key can be found on Teacher Resource 3.

Reteaching/Extension
- Reteaching-In small group, use smaller data sets to construct line plots
- Extension- Have students complete Student Resource 5 (analyze data). See answer key on Teacher Resource 4.

Lesson 3

Pre-Assessment
- Display class data from yesterday’s exercises alongside a line plot with another class’ data (Teacher Resource 5).
- Discuss which class is more physically fit based on the data. Students should justify their responses with specific details from the line plots.

Launch
- Divide students into their Exercise Pairs and distribute one jump rope per pair. This activity should be done outside or in the hallway. Timing of jumping should be modified according to space limitations.
- Review roles of each teammate. While A is exercising, B is counting the number of jumps and he or she records the final number on Student Resource 6. Then, alternate roles.
- Teacher times one minute while A’s do jumps. Repeat for the B’s.

Teacher Facilitation
- Bring class back together as a whole group. Record class data on board.
- Ask students if a line plot would be an appropriate way to display the data. If they say yes, ask what the starting point and ending point would be on the number line. Point out that the range would be too great and the number line would be too long. It would be appropriate but probably not the easiest choice.
- Distribute graph paper to each student.
• Guide students in the construction of a stem and leaf plot. Remember to include a title and key.
• Analyze the data to find the range, mode, median, outliers, and clusters.
• Remind students why we use a stem and leaf plot instead of a line plot. Discuss the similarities and differences between the two plots. You may use a Venn diagram.

Student Application
• Measure the height of each student (in inches) and record it on the board.
• Direct students to construct a stem and leaf plot of the students’ heights and answer questions analyzing the data to find the measures of center.
• Discuss the results as a class.

Embedded Assessment
• Student Resource 6 - Hop, Skip, Jump Rope Company Survey – A PE teacher is buying new jump ropes for your class. Which length should he buy? Why? Explain using your knowledge of measures of center.
• Write Mr. Jones a letter telling him what he should purchase.

Reteaching/Extension
• Reteach: In small group, repeat with a smaller set of data.
• Extension: How much would the P.E. teacher spend on buying jump ropes for the class given the price ranges? Include your information on the P.S. portion of your friendly letter.

Summative Assessment:

Students will demonstrate an understanding of measures of center, line plots, and stem and leaf plots. The assessment in Student Resource 7 will allow students to exhibit their knowledge by choosing an appropriate graphic display, constructing either a line plot or stem and leaf plot, thus making a decision based on their knowledge of line plots, stem and leaf plots, and finding an appropriate measure of center. Answer key can be found on Teacher Resource 6.
Appendix A: Student Resources

Student Resource 1 - Cheerio Fun!
Student Resource 2 - Extend Your Thinking: Money Found Under Grandma’s Couch
Student Resource 3 - How Fit Are We?
Student Resource 4 - Star Shooters

Student Resource 5 - Extend Your Thinking: Are We Physically Fit?
Student Resource 5 Answer Key
Student Resource 6 - A Hop, Skip, and a Jump Rope
Student Resource 7 - Thirst Quenchers

Appendix B: Teacher Resources

Teacher Resource 1 - Favorite Sports in ______________’s Class
Times of a 50-Meter Dash
Teacher Resource 2 - Extend Your Thinking: Money Found Under Grandma’s Couch - Answer Key
Teacher Resource 3 - Star Shooters - Answer Key
Teacher Resource 4 - Extend Your Thinking - Are We Physically Fit?  - Answer Key
Teacher Resource 5 - How Do We Measure Up?
Teacher Resource 6 - Thirst Quenchers - Answer Key

Authors:

Stephanie Katz     Kate Boehmler
Greenbelt Elementary     Johnnycake Elementary
Prince George’s County, MD     Baltimore County, MD
Cheerio Fun!

Estimate: How many Cheerios do you think you eat in one spoonful?

____ Cheerios

Take 3 spoonfuls of Cheerios and put one spoonful in each cereal bowl below.

Create your 3-D bar graph. List your data and the data from other members in your group below in order from least to greatest.

Small Group Discussion:

😊 What was the greatest number of Cheerios a student in your group had in a spoonful?

________

😊 What was the least? _____________

😊 What is the difference between the greatest and least numbers? ________

😊 What is the range of the data? __________

😊 What number of Cheerios occurred most frequently? __________

😊 What is the mode? __________

😊 What is the middle number of your groups’ spoonfuls? __________

😊 What is the median? __________
Class Discussion:
😊 What if you want to find the typical amount of a spoonful? What could you do to the stacks?
😊 About how many Cheerios are in each stack? _________
😊 What is the mean? _________

Can You Stack Your Own Graph?

Directions:
1. Using the bag of stackable items you were given, grab one handful of items.
2. Stack the items to create a vertical bar along the masking tape on your desk. Count the items as you stack.
3. Repeat Steps 1 and 2 two more times. Then have your teammates grab and stack 3 times each. (You should have 9 stacks total.)
4. Arrange your stacks from least to greatest. Record your data below.

|    |    |    |    |    |    |    |    |

Questions:
😊 What is the range of the set of data? _________
😊 What is the mode of the data? _________
😊 What is the median of the data? _________
😊 What is the mean of the data? _________
😊 Use the graph to write another statement about your data.

___________________________________________________________________________

___________________________________________

Thinking Ahead
😊 Were there any data points that were very different from the rest?

YES
NO
Extend Your Thinking: Money Found Under Grandma’s Couch

You go to your grandma’s house and she asks you to vacuum under the couch. She says, “Anything you find, you can keep!” You hit the jackpot. You found coins under every cushion. You decide it would be to your benefit to help her clean monthly.

Look at the number of nickels you found each month:

<table>
<thead>
<tr>
<th></th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickels</td>
<td>12</td>
<td>8</td>
<td>3</td>
<td>11</td>
<td>6</td>
</tr>
</tbody>
</table>

Use the graph above to answer the following questions:

1. What is the range? __________
2. What is the median? __________
3. What is the mean? _____
4. **Hint: Mathematicians find the mean by adding all the data and dividing by the number of data points. (Think: Total number of nickels divided by how many months you cleaned grandma’s couch) - Show your work below!

   Extension:
   Now for the real challenge, count your profits…
Each nickel is worth five cents.

How much money did you find in:

- April? ___________
- May? ___________
- June? ___________
- July? ___________
- August? ___________

Use the values you just found to find the following information:

- What is the range? ___________
- Why did the range change?

___________________________________________________________________________

___________________________________________________________________________

About how much money did you find each month? ___________

(Find the mean using the hint from before.)

Show your work below!
How Fit Are We?

How many sit-ups can your Exercise Team do in one minute?
   Me _________   My partner __________

Let’s make a line plot together using the class’ data.

Questions:

😊 What is the range of the set of data? __________

😊 What is the mode of the data? __________

😊 What is the median of the data? __________

😊 Are there many data points in one particular area? If so, where were they located? 

_________________________________________________________  This is called a cluster.

😊 Are there any data points that were very different from the rest? If so, where were they located? __________________________________________________

😊 This is called an outlier.

😊 Are there any points on the line plot that had no data? If so, where were they located? __________________________

😊 This is called a gap.

How many toe-touches can your Exercise Team do in one minute?
   Me _________   My partner __________

Side Bonus:

How many sit-ups did your Team do together?

How many toe-touches did your Team do together?
Let’s make a line plot together using the class’ data.

Questions:

😊 What is the **range** of the set of data? ____________

😊 What is the **mode** of the data? ____________

😊 What is the **median** of the data? ____________

😊 Are there any **clusters**? If so, where are they located? ___________________________________________________________________________

😊 Are there any **outliers**? If so, where are they located? ___________________________________________________________________________

😊 Are there any **gaps**? If so, where are they located? ___________________________________________________________________________

😊 Use the line plot to write another statement about your data.

___________________________________________________________________________
___________________________________________________________________________
Star Shooters

Your basketball team is having a free throw shooting contest. Your job is to record the number of shot each player made out of ten. Use the data below to construct a line plot:

Number of Free Throws

<table>
<thead>
<tr>
<th>0</th>
<th>5</th>
<th>5</th>
<th>7</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>10</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Questions:

😊 What is the **range** of the set of data? __________

😊 What is the **mode** of the data? __________

😊 What is the **median** of the data? __________

😊 Are there any **clusters**? If so, where are they located?

__________________________________________________________________________

😊 Are there any **outliers**? If so, where are they located?

__________________________________________________________________________
Extend Your Thinking: Are We Physically Fit?

Look at the table below to compare our class to the average child.

<table>
<thead>
<tr>
<th>Exercises Completed in One Minute by 8-10 Year Olds</th>
<th>Sit-Ups</th>
<th>Toe-Touches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below average</td>
<td>0-25</td>
<td>0-19</td>
</tr>
<tr>
<td>Average</td>
<td>26-35</td>
<td>20-29</td>
</tr>
<tr>
<td>Above average</td>
<td>36 and above</td>
<td>30 and above</td>
</tr>
</tbody>
</table>

As a class, are we physically fit? Explain why you feel this way. Use data from the sit-up and toe-touch line plots to support your answer.
A Hop, Skip, and a Jump Rope

How many jumps can your Exercise Team do in one minute?
Me _________  My partner _________

Record the results of all your classmates in the box below.

Think:
Would a line plot be an appropriate way to display this data? Why or why not?

Construct a stem and leaf plot using the data above.

Key:  |  = ___ jumps

😊 What is the range of the set of data?  __________
😊 What is the mode of the data?  __________
😊 What is the median of the data?  __________
😊 Were there any clusters? If so, where were they located?

______________________________
Were there any outliers? If so, where were they located?
_________________________________________________________

Were there any gaps? If so, where were they located?
_________________________________________________________

Use the stem and leaf plot to write another statement about your data.
_________________________________________________________

Data Collection for Gym Class Order

Mr. Jones, the P.E. teacher, has offered to buy new jump ropes for the school. He needs to know what length jump ropes he should buy. For example, the taller the student, the longer the jump rope he or she will need. He is surveying your class to find out how tall students typically are (in inches).

As each student in the class’ height is measured, record the data in the chart below.

Heights of Students in Inches

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Think:
Would a line plot be an appropriate way to display this data? Why or why not?
Construct a stem and leaf plot using the data just collected.

| Key:  | = ___ inches |

😊 What is the **range** of the set of data? ___________
😊 What is the **mode** of the data? ___________
😊 What is the **median** of the data? ___________
😊 Are there any clusters, outliers, or gaps? If so, where are they?
________________________________________________________________________
________________________________________________________________________

The Hop, Skip, Jump Rope Company sells three sizes of jump ropes.

<table>
<thead>
<tr>
<th>Size</th>
<th>Best for students:</th>
<th>Price per Pack of 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Up to 45 inches</td>
<td>$10.00</td>
</tr>
<tr>
<td>M</td>
<td>Between 46 and 50 inches</td>
<td>$12.50</td>
</tr>
<tr>
<td>L</td>
<td>51 inches or taller</td>
<td>$15.00</td>
</tr>
</tbody>
</table>

Use the information in the table above to help Mr. Jones decide which size jump ropes to buy. He is able to buy 3 packs for your gym class. Write him a short friendly letter explaining what size jump ropes and how many packs of each he should purchase. Make sure to support your decision with data from the stem and leaf plot.

Extend Your Thinking:

Use the pricing information in the table to inform Mr. Jones how much he would spend based on your order recommendation. Make sure you show your work so he understands how you got your answer. Include this as a P.S. at the end of your friendly letter.
Dear Mr. Jones,

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

_____________________________________________

Your student,

_____________________________________________

P.S.

________________________________________________________________________
________________________________________________________________________

Here’s how I got my answer:
Thirst Quenchers

It is recommended that adults drink 64-oz of water a day. The following table shows how many ounces of water the teachers at your school drink each day.

<table>
<thead>
<tr>
<th>Ounces of Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
</tr>
<tr>
<td>64</td>
</tr>
</tbody>
</table>

What is the range of the set of data?

A 40  B 62  C 68  D 78

Step A: Construct and label a stem and leaf plot or a line plot to display your data. Be careful, only one is appropriate for this set of data.

Step B: Do the adults at our school drink enough water? Explain why or why not? Use data from your plot to explain your answer.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Favorite Sports in ____________'s Class

<table>
<thead>
<tr>
<th>Sports</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football</td>
<td>12</td>
</tr>
<tr>
<td>Soccer</td>
<td>4</td>
</tr>
<tr>
<td>Baseball</td>
<td>2</td>
</tr>
<tr>
<td>Basketball</td>
<td>6</td>
</tr>
</tbody>
</table>

Times of a 50-Meter Dash

<table>
<thead>
<tr>
<th>Time (in seconds)</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
</table>
Extend Your Thinking: Money Found Under Grandma’s Couch

You go to your grandma’s house and she asks you to vacuum under the couch. She says, “Anything you find, you can keep!” You hit the jackpot. You found coins under every cushion. You decide it would be to your benefit to help her clean monthly.

Look at the number of nickels you found each month:

<table>
<thead>
<tr>
<th>Months</th>
<th>Number of Nickels</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>12</td>
</tr>
<tr>
<td>May</td>
<td>8</td>
</tr>
<tr>
<td>June</td>
<td>3</td>
</tr>
<tr>
<td>July</td>
<td>11</td>
</tr>
<tr>
<td>August</td>
<td>6</td>
</tr>
</tbody>
</table>

Use the graph above to answer the following questions:

1. What is the range? 9
2. What is the median? 8
3. What is the mean? $40 \div 5 = 8$

**Hint: Mathematicians find the mean by adding all the data and dividing by the number of data points. (Think: Total number of nickels divided by how many months you cleaned grandma’s couch) — Show your work below!**
Now for the real challenge, count your profits…

😊 Each nickel is worth five cents.
😊 How much money did you find in:
   o April?  $12 \times 5 = 60$ cents
   o May?  $8 \times 5 = 40$ cents
   o June?  $3 \times 5 = 15$ cents
   o July?  $11 \times 5 = 55$ cents
   o August?  $6 \times 5 = 30$ cents

Use the values you just found to find the following information:

😊 What is the range?  $45$
😊 Why did the range change?

*Answers may vary. Should include information about the value of the coin being 5 cents, so all data was multiplied by 5*

😊 About how much money did you find each month?  $40$ cents
   (Find the mean using the hint from before.)
😊 Show your work below
Your basketball team is having a free throw shooting contest. Your job is to record the number of shots each player made out of ten. Use the data below to construct a line plot:

### Number of Free Throws Made

<table>
<thead>
<tr>
<th>Number of Free Throws</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our Team’s Free</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Questions:

😊 What is the **range** of the set of data?  
10 – 0 = 10

😊 What is the **mode** of the data?  
5 and 8

😊 What is the **median** of the data?  
7

😊 Are there any clusters? If so, where are they located?

*There was a cluster between 5 and 8.*

😊 Are there any **outliers**? If so, where are they located?

*There was an outlier at 0.*
Extend Your Thinking: Are We Physically Fit?

Look at the table below to compare our class to the average child.

<table>
<thead>
<tr>
<th>Exercises Completed in One Minute by 8-10 Year Olds</th>
<th>Sit-Ups</th>
<th>Toe-Touches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below average</td>
<td>0-25</td>
<td>0-19</td>
</tr>
<tr>
<td>Average</td>
<td>26-35</td>
<td>20-29</td>
</tr>
<tr>
<td>Above average</td>
<td>36 and above</td>
<td>30 and above</td>
</tr>
</tbody>
</table>

As a class, are we physically fit? Explain why you feel this way. Use data from the sit-up and toe-touch line plots to support your answer.

*Answers may vary. Should include information from the table and compare it to information from the class line plots (Student Resource 3)*
How Do We Measure Up?

### Our Class’ Sit-ups

<table>
<thead>
<tr>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>26</th>
<th>27</th>
<th>28</th>
<th>29</th>
<th>30</th>
<th>31</th>
<th>32</th>
<th>33</th>
<th>34</th>
<th>35</th>
</tr>
</thead>
</table>

### Ms. Smith’s Class’ Sit-ups

<table>
<thead>
<tr>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>26</th>
<th>27</th>
<th>28</th>
<th>29</th>
<th>30</th>
<th>31</th>
<th>32</th>
<th>33</th>
<th>34</th>
<th>35</th>
</tr>
</thead>
</table>
Thirst Quenchers

It is recommended that adults drink 64-oz of water a day. The following table shows how many ounces of water the teachers at your school drink each day.

<table>
<thead>
<tr>
<th>Ounces of Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>56 62 12 24 48 32 25 56 64 36</td>
</tr>
<tr>
<td>64 70 8 36 56 51 45 56 38 16</td>
</tr>
</tbody>
</table>

What is the range of the set of data?

Ⓐ 40  Ⓑ 62  Ⓖ 68  Ⓗ 78

Step A: Construct and label a stem and leaf plot or a line plot to display your data. Be careful, only one is appropriate for this set of data.

```
Water Drunk by Adults per Day (in ounces)

0 | 8
1 | 2 6
2 | 4 5
3 | 2 6 6 8
4 | 5 8
5 | 1 6 6 6 6
6 | 2 4 4
7 | 0
```

Step B: Do the adults at our school drink enough water? Explain why or why not? Use data from your plot to explain your answer.

*Answers may vary.* Should include that adults at our school are not *drinking____ enough water based on their understanding of mode, median, and/or clusters of data.*