

Pocatello/Chubbuck School District #25

MATHEMATICS

Subject/Grade or Course: 6<sup>th</sup> Math

Unit Name: G6 Math Unit 1

Pacing: 3 weeks

ESTABLISHED GOALS:		
<p><b>Major (m) Idaho Core cluster for the Unit:</b></p>	<p><b>Supporting and Additional (s/a) Idaho Core Standards for the Unit:</b></p> <p><b>Develop understanding of statistical variability</b></p> <ul style="list-style-type: none"> <li>6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. <i>For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.</i></li> <li>6.SP.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.</li> <li>6.SP.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</li> </ul> <p><b>Summarize and describe distributions.</b>  <i>The following standards have not previously been part of Idaho Standards for 6<sup>th</sup> grade:</i></p> <ul style="list-style-type: none"> <li><i>6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</i></li> <li><i>6.SP.5. Summarize numerical data sets in relation to their context, such as by:</i></li> <li><i>6.SP.5a Reporting the number of</i></li> </ul>	<p><b>Bridging Idaho Core Standards from Previous Grade(s):</b></p> <ul style="list-style-type: none"> <li>5.MD.2. Make a line plot to display a data set of measurements in fractions of a unit (<math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{8}</math>). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.</li> <li>4.MD.4. Make a line plot to display a data set of measurements in fractions of a unit (<math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{8}</math>). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.</li> <li>3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.</li> <li>3.MD.4. Generate measurement data by</li> </ul>

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*observations.*

- *6.SP.5b Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.*
- *6.SP.5c Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.*
- *6.SP.5d Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.*

measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

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**TRANSFER**

*Students will be able to independently use their learning to...*

Gather, analyze and interpret data.

**MEANING**

**Structure of Math/  
Overarching**

**Understanding(s):**

- Statistics is the analysis of data.

**Understandings:**

**Students will understand that:**

- The shape of a graph provides information about the data.
- Quantitative measures provide information about the data.

**Essential Questions:**

**Students will keep considering:**

- Why do we gather and analyze data?
- How does data analysis inform and influence decisions?

**ACQUISITION OF KNOWLEDGE AND SKILL**

**STUDENT-FRIENDLY LEARNING TARGET STATEMENTS**

6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.*

- MP.1 Make sense of problems and persevere in solving them.
- MP.2 Reason abstractly and quantitatively.
- MP.3 Construct viable arguments and critique the reasoning of others.
- MP.4 Model with mathematics.
- MP.5 Use appropriate tools strategically.
- MP.6 Attend to precision.
- MP.7 Look for and make use of structure.
- MP.8 Look for and express regularity in repeated reasoning.

- Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers
  - I can define statistics as the science of collecting, analyzing, and interpreting data
  - I can define data as the information given in answer to a statistical question
  - I can describe variability as representing a range of information
  - I can recognize a statistical question by how much variability is in the answer
  - I can describe the effectiveness of a statistical question by the variety of possible answers

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<p>6.SP.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.</p> <ul style="list-style-type: none"><li>• Understand that a set of data collected to answer a statistical question has a distribution.<ul style="list-style-type: none"><li>○ I can justify that a data set has a distribution of data</li><li>○ I can describe distribution by its center, spread, and overall shape.</li><li>○ I can evaluate a model that shows the distribution of data</li><li>○ I can describe the distribution of a graph by its clusters, peaks, gaps, and symmetry</li></ul></li></ul>
<p>6.SP.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.</p> <ul style="list-style-type: none"><li>• Recognize that a measure of center for a numerical data set summarizes all of its values with a single number.<ul style="list-style-type: none"><li>○ I can describe the center of a distribution by the mean, median, or mode of the data set</li><li>○ I can explain that the center of the data set can be described by a single number.</li><li>○ I can explain that the center represents all the numbers in the data set</li><li>○ I can evaluate the average of the data set by using the mean</li><li>○ I can evaluate the middle of the data set by using the median</li><li>○ I can evaluate the frequency of a data item by using the mode</li><li>○ I can discuss the meaning of the center measurements and how they compare to each other</li></ul></li><li>• Recognize that a measure of variation describes how values vary with a single number.<ul style="list-style-type: none"><li>○ I can explain that the variation of the data describes the difference between the highest and lowest</li></ul></li></ul>

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	<p style="text-align: center;">data items</p> <ul style="list-style-type: none"> <li>○ I can evaluate the spread of the data by using the range</li> </ul>
<p>6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p>	<p>MP.1 Make sense of problems and persevere in solving them.  MP.2 Reason abstractly and quantitatively.  MP.3 Construct viable arguments and critique the reasoning of others.  MP.4 Model with mathematics.  MP.5 Use appropriate tools strategically.  MP.6 Attend to precision.  MP.7 Look for and make use of structure.  MP.8 Look for and express regularity in repeated reasoning.</p> <ul style="list-style-type: none"> <li>● Display data graphically <ul style="list-style-type: none"> <li>○ I can determine appropriate display of data on a number line including dot plots, histograms, or box plots</li> <li>○ I can interpret data from graphs generated by others</li> </ul> </li> <li>● Display numerical data in plots on a number line. <ul style="list-style-type: none"> <li>○ I can model data in a number line</li> </ul> </li> <li>● Display numerical data in plots on dot plots. <ul style="list-style-type: none"> <li>○ I can model data in dot plots</li> </ul> </li> <li>● Display numerical data in plots on histograms. <ul style="list-style-type: none"> <li>○ I can model data in histograms</li> </ul> </li> <li>● Display numerical data in plots on box plots. <ul style="list-style-type: none"> <li>○ I can model data in box plots</li> <li>○</li> </ul> </li> </ul>
<p>6.SP.5a Summarize numerical data sets in relation to their context, such as by reporting the number of observations.</p>	<p>MP.1 Make sense of problems and persevere in solving them.  MP.2 Reason abstractly and quantitatively.  MP.6 Attend to precision.</p> <ul style="list-style-type: none"> <li>● Summarize numerical data sets in relation to their context by reporting the number of observations. <ul style="list-style-type: none"> <li>○ I can identify the attributes of a set of data <ul style="list-style-type: none"> <li>▪ For example: How did you get your data? How large was your sample?</li> </ul> </li> <li>○ I can summarize numerical data based on the context</li> </ul> </li> </ul>

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<p>6.SP.5b Summarize numerical data sets in relation to their context, such as by describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p> <ul style="list-style-type: none"><li>● Summarize numerical data sets in relation to their context by describing the nature of the attribute under investigation (including how it was measured and its units of measurement).<ul style="list-style-type: none"><li>○ I can identify attributes of the data</li><li>○ I can discuss attributes of the data</li><li>○ I can analyze how the attributes effect the data</li></ul></li></ul>
<p>6.SP.5c Summarize numerical data sets in relation to their context, such as by giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.</p> <ul style="list-style-type: none"><li>● Summarize numerical data sets in relation to their context by giving quantitative measures of center (median and/or mean).<ul style="list-style-type: none"><li>○ I can compute and justify the quantitative measures of center (median and/or mean)</li></ul></li><li>● Describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered (outliers).<ul style="list-style-type: none"><li>○ I can discuss how outliers affect the quantitative measures of center by skewing the data</li></ul></li><li>● Summarize numerical data sets in relation to their context by giving quantitative measures of variability (interquartile range and/or mean absolute deviation.)<ul style="list-style-type: none"><li>○ I can compute and justify the mean absolute deviation</li><li>○ I can compute and justify the interquartile range</li></ul></li></ul>

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<p>6.SP.5d Summarize numerical data sets in relation to their context, such as by relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.</p>	<p>MP.1 Make sense of problems and persevere in solving them.          MP.2 Reason abstractly and quantitatively.          MP.3 Construct viable arguments and critique the reasoning of others.          MP.4 Model with mathematics.          MP.5 Use appropriate tools strategically.          MP.6 Attend to precision.          MP.7 Look for and make use of structure.          MP.8 Look for and express regularity in repeated reasoning.</p> <ul style="list-style-type: none"> <li>• Summarize numerical data sets in relation to their context by relating the choice of measures of center and variability to the shape of the data distribution.             <ul style="list-style-type: none"> <li>○ I can determine when it's appropriate to use mean</li> <li>○ I can determine when it's appropriate to use median</li> <li>○ I can determine when it's appropriate to use mode</li> <li>○ I can determine which of those would be the best measure of center for a set of data</li> <li>○ I can explain how variability and measure of center are related in set of data</li> <li>○ I can describe the impact of measures of center on the shape of a graph</li> </ul> </li> <li>• Summarize numerical data sets in relation to the context in which the data were gathered.             <ul style="list-style-type: none"> <li>○ I can determine a context that is appropriate for each measure of center (mean, median, and mode)</li> </ul> </li> </ul>
<p style="text-align: center;"><b>ASSESSMENT EVIDENCE:</b> Assessment Tasks that Provide Evidence for Claims including DOK</p>	<p><input type="checkbox"/> <b>Claim #1/DOK 1, 2, 3, 4 (circle one):</b></p>
	<p><input type="checkbox"/> <b>Claim #2/DOK 1, 2, 3, 4 (circle one):</b></p>
	<p><input type="checkbox"/> <b>Claim #3/DOK 1, 2, 3, 4 (circle one):</b></p>
	<p><input type="checkbox"/> <b>Claim #4/DOK 1, 2, 3, 4 (circle one):</b> <input type="checkbox"/></p>
<p><b>Materials/Resources</b></p>	
<p><b>Teacher Notes</b></p>	

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## Sample Learning Plan

**This is not intended to be a scope and sequence**

Exploring and Making Connections (Conceptual Understanding)	Practice (Procedural Fluency)	Assessments (Application)
<b>6.SP.1, 6.SP.2, 6.SP.3</b>		
<p><b>Focus Task (to begin unit):</b>            You are on the school newspaper staff and you have been asked to write an article in the opinions section. You will need to create a survey and report your data.</p> <p>USE THIS FOCUS TASK THROUGHOUT THE UNIT</p>	<p><b>Sample learning tasks:</b>  <b>Teacher note: These tasks may need refinement based on the needs of your students. Not all tasks have been vetted. These documents can be found in Moodle.</b></p> <p>Disney Land Wait Times</p> <p><b>Material Resources:</b>            Prentice Hall chapter 7 sections 1, 2 and 3            Prentice Hall chapter 7 section 1            Story Problem Workbook page 15, 16</p>	<p><b>Formative assessment by teacher using I Can statement checklist</b></p>
<b>6.SP.4, 6.SP.5a-d</b>		
<p><b>Focus Task (to begin unit):</b>            Choose from the learning tasks to find a task that will fit the needs of the students.</p>	<p><b>Sample learning tasks:</b>  <b>Teacher note: These tasks may need refinement based on the needs of your students. Not all tasks have been vetted. These documents can be found in Moodle.</b></p> <p>Birthday Buddies            Blast Off            How am I doing in Math            Box and Whisker Butter Fingers            Frog Jumping Contest (Oragami frog)            Frog Jumping Contest            Basketball Fans            Junk in the Trunk            Tina's Texting Tragedy            NBA Lesson</p>	<p><b>Formative assessment by teacher using I Can statement checklist</b></p>



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	Movie Money Makers <b>Material Resources:</b> Prentice Hall chapter 7 Story Problem Workbook pg 10,11, 12, 13, and 14, 17	
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**Stage 3 Learning Plan**

Focus	Coherence/Rigor	
Learning Goal(s): <ul style="list-style-type: none"> <li>• Understand that statistical questions anticipate variability</li> </ul>	Task/Activity/Resource <b><u>Illustrative Math Task</u></b> 6.SP.A.1 Buttons- Statistical Questions 6.SP.A.1 Identifying Statistical Questions  <b><u>Other Tasks</u></b> 6.SP.1 Rewriting Statistical Questions 6.SP.1, 6.SP.2 Through the Grapevine  <b><u>Sample Assessment Items</u></b> <u>Claim 1</u> 6.SP.1 Ronnie  <u>Claim 2</u>  <u>Claim 3</u> 6.SP.1 Statistical Questions 1 6.SP.1 Statistical Questions 2	Evidence (Success Criteria): <ul style="list-style-type: none"> <li>• Students will create a statistical question that will be used to poll classmates</li> <li>• Students will conduct a poll using a statistical question</li> </ul>
Learning Goal(s): <ul style="list-style-type: none"> <li>• Understand that data can be represented in a variety of formats.</li> </ul>	Task/Activity/Resource <b><u>Illustrative Math Task</u></b> 6.SP.A.2, 6.SP.B.4 Puppy Weights  <b><u>Other Tasks</u></b>  <b><u>Sample Assessment Items</u></b>	Evidence (Success Criteria): <ul style="list-style-type: none"> <li>• Students will represent the data collected during their poll using a box plot, histogram, and a dot plot</li> <li>• Students will write a</li> </ul>




















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	<p><u>Claim 1</u></p> <p><u>Claim 2</u> 6.SP Animal Adoptions Part One 6.SP Rainfall</p> <p><u>Claim 3</u></p>	<p>description of each graph</p>
<p>Learning Goal(s):</p> <ul style="list-style-type: none"> <li>• Understand that choosing the appropriate format can make analysis more meaningful, including:             <ul style="list-style-type: none"> <li>○ Center (median, mean)</li> <li>○ Spread (range)</li> <li>○ Deviation</li> <li>○ How it was measured</li> <li>○ Units of measurement</li> </ul> </li> </ul>	<p>Task/Activity/Resource</p> <p><b><u>Illustrative Math Task</u></b> 6.SP.A.2, 6.SP.B.5.d Electoral College 6.SP.B.4, 6.SP.B.5.c Puzzle Time</p> <p><b><u>Other Tasks</u></b></p> <ul style="list-style-type: none"> <li> 6.SP Mean, Median, Mode and Range</li> <li> 6.SP Mean, Median, Mode and Range</li> <li> 6.SP Pick a Pocket</li> <li> 6.SP Representing Data</li> <li> 6.SP Representing Data</li> <li> 6.SP.1 Rewriting Statistical Questions</li> <li> 6.SP.1, 6.SP.2 Through the Grapevine</li> <li> 6.SP.1,4,5 Basketball Fans</li> <li> 6.SP.2,3,4 Birthday Buddies</li> <li> 6.SP.2,3,4 Blast off!</li> <li> 6.SP.2,3,4 How am I doing in Math</li> <li> 6.SP.3 Disneyland Wait Times</li> <li> 6.SP.4 Box-and-Whisker-Butterfingers</li> <li> 6.SP.4 Frog jumping contest (oragami fro...</li> <li> 6.SP.4 Frog jumping contest</li> <li> 6.SP.4,5 Junk in the Trunk</li> <li> 6.SP.4,5 Tina's Texting Tragedy</li> <li> 6.SP.5 NBA Lesson</li> <li> 6.SP.5c Movie Money Makers</li> </ul> <p><b><u>Sample Assessment Items</u></b></p>	<p>Evidence (Success Criteria):</p> <ul style="list-style-type: none"> <li>• Students will choose the graph that displays the information for their data set most effectively</li> <li>• Students will create a written analysis of their data set that includes a description of the following:             <ul style="list-style-type: none"> <li>○ Center (median, mean)</li> <li>○ Spread (range)</li> <li>○ Deviation</li> <li>○ How it was measured</li> <li>○ Units of measurement</li> </ul> </li> </ul>

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Claim 1

6.SP.4 Efficiency Levels of Cars

6.SP.4, 6.SP.5 Gym Class

6.SP.4, 6.SP.5c Puzzle Times

Claim 2

6.SP Retirement ages

Claim 3

6.SP Animal Adoptions Part Two

6.SP Jerome

6.SP Kilowatt Hours

6.SP.5 South America

Claim 4

6.SP Baseball Players

**Material Resources**

Prentice Hall chapter 7

Story Problem Workbook pg 10,11, 12, 13, 14, 17, 15,  
and 16

Connected Math Data About Us