SOARING HEIGHTS
CHARTER SCHOOL
DEVELOPING CHARACTER • BUILDING COMMUNITY • GROWING LEADERS

Soaring Heights Charter School **Revised August 2024**

6th Grade Math -

Big Ideas Math

Chapter 1 - Numerical Expressions and Factors

STANDARDS

6.NS.B.4 - Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4(9+2) .

6.EE.A.1 - Write and evaluate numerical expressions involving whole-number exponents.

6.EE.A.2 - Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.A.2a - Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract from 5" as .

6.EE.A.2b -Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression as a product of two factors; view as both a single entity and a sum of two terms.

6.EE.A.2c -Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when **there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas and to find the volume and surface area of a cube with sides of length .**

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

Objectives:

- Write and evaluate expressions involving exponents.
- Write and evaluate numerical expressions using the order of operations.
- Write a number as a product of prime factors and represent the product using exponents.
- Find the greatest common factor of two numbers.
- Find the least common multiple of two numbers.

Activities:

Setting the Table

1. You will be asked to plan a fundraising event with the following items; 72 chairs, 48 balloons, 24 flowers and 32 candles. You will find the greatest number of identical tables that can be prepared, and what will be in each centerpiece. When making arrangements for a party, should a party planner always use the greatest number of identical tables possible? Explain why or why not.

2.Filling Pinataas

Party Favor	Taffies	Key Chains	Kazoos	Bubbles	Mints
Number	50	12	16	24	100

You want to create 6 identical pinatas. How can you change the numbers of party favors in the table to make this happen? Can you do this without changing the total number of party favors?

3. Play Triple Prime Time by allowing the host to draw a prime number, call it out, and replace it. Then find a number on the grid that has the chosen prime number as a factor. Write the prime number in that square. Each number on your grid has three prime numbers. The host continues to draw slips and call numbers. When you record all three prime factors for a number, cross out the square. The first player to cross out four squares in a row wins..

Gifted and Talented

1. Find all the even numbers between 1,000 and 2,000 that are divisible by 5 and also by 9. 2. Find all the fractions equivalent to 8,085/14,553 in which both numerator and denominators are whole numbers less than 50..

Chapter 2 - Fractions and Decimals

STANDARDS

6.NS.A.1 - Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (⅔) / (¾) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (⅔) / (¾) = 8/9 because ¾ of 8/9 is 2/3. (In general, (a/b)/(c/d)=ad/bc). How much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many ¾ cup servings are in ⅔ of a cup of yogurt? How wide is a rectangular strip of land with length ¾ mi and area ½ square mi?

6.NS.B.2 - With accuracy and efficiency, divide multi-digit numbers using the standard algorithm.

6.NS.B.3 -With accuracy and efficiency, add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

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Objectives:

- Find products involving fractions and mixed numbers.
- Compute quotients of fractions and solve problems involving division by fractions.
- Compute quotients with mixed numbers and solve problems involving division with mixed numbers.
- Add and subtract decimals and solve problems involving addition and subtraction of decimals.
- Multiply decimals and solve problems involving multiplication of decimals.
- Divide whole numbers and solve problems involving division of whole numbers.
- Divide decimals and solve problems involving division of decimals.
- Divide fraction and mixed numbers.
- With accuracy and efficiency add, subtract, multiply and divide multi-digit decimals.

Activities:

Space Explorers

You will use a table that shows the average distances between the Sun and each planet in our solar system to find several distances in space. Then you will use the speed of the Orion spacecraft to answer questions about time and distance. Is it realistic for a manned spacecraft to travel to each planet in our solar system? Explain why or why not?

Chapter 3 - Ratios and Rate

STANDARDS

6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes.

6.RP.A.2 - Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is ¾-cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." (Clarification: Expectations for unit rates in this grade are limited to non-complex fractions.)

6.RP.A.3 - Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

6.RP.A.3a - Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

6.RP.A.3b - Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

6.NS.C.8 - Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

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Objectives

- Understand the concepts of ratios and equivalent ratios.
- Use tape diagrams to model and solve ratio problems.
- Use ratio tables to represent equivalent ratios and solve ratio problems.
- Represent ratio relationships in a coordinate plane.
- Understand the concept of a unit rate and solve rate problems.

- Use ratio reasoning to convert units of measure.
- Understand ratios and describe ratio relationships.
- Understand unit rates and rates.
- Use ratio and rate reasoning to solve real-world and mathematical problems.
- Compare ratios using tables.
- Solve unit rate problems
- Use ratio reasoning to convert measurement units.

Activities:

1. Students will solve real-life situations of unit conversion mistakes of the following: blood transfusion, airplane fuel, baby medication and zoo enclosure. In each situation, students will analyze and correct the mistakes in the unit conversion. How accurate must conversion be in real-life situations?

2. Each partner writes four pairs of ratios. Partners exchange papers and use cross products to find whether each pair forms a proportion. Each partner then writes two proportions similar to those in 13-21. They exchange papers and solve each proportion.

3. Each student in a pair writes a size and cost for two different quantities of the same product. Partners exchange papers and find each unit cost to determine the better buy.

Gifted and Talented Activities:

1.Have students go to the grocery store to find an item which is sold in 3 different sizes and bring the prices to class. Then have them determine which is the best buy. Challenge students to find a product for which the smaller package is the better buy.

2. Have students use what they have learned about percents to guess what percent of the total population of the United States lives in each state. Then have them use an almanac to verify their guesses.

3. Have students develop a questionnaire and conduct a survey to see which sports are most popular at different grade levels. Have them represent the results as percents of the total number of students surveyed at each grade and the total number of students surveyed in all.

Chapter 4 - Percents

STANDARDS

6.RP.3 - Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or

equations.

6.RP.3c - Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

6.NS.C.7 - Understand ordering and absolute value of rational numbers.

6.NS.C.7b - Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3 degree C . -7 degree C to express the fact that -3 is warmer than -7 .

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Objectives:

- Write percents as fractions and fractions as percents.
- Write percents as decimals and decimals as percents. Compare and order fractions, decimals, and percents.
- Find a percent of a quantity and solve percent problems.
- Use ratio and rate reasoning to solve real-world and mathematical problems.
- Find percent as a rate per 100, solve problems involving finding the whole, given a part and the percent.
- Understand ordering of rational numbers.

Activities:

1. Genetic Ancestry

Students will be given the results of your friend's ancestry test. Native American 1/50, African 30/40, Northern European .10, Southwest Asian 3/75, and Mediterranean .06. Students will be asked to compare the portions of your friend's ancestry from different regions of the world. How can you order the portions of your friend's ancestry from least to greatest.

2. Chargaff's Rules

DNA is a molecule made up of four nucleotide bases called adenine(A), thymine (T), cytosine O and guanine(G). DNA contains the genetic information for a living organism. Veronica says that the DNA of most mammals contains about 60% A and T nucleotides and 40% C and G nucleotides. Look at the table and determine which of the samples) are mammals.

	Sample 1	Sample 2	Sample 3
A and T nucleotides	38	60	61
C and G nucleotides	62	39	100

Chapter 5 - Algebraic Expressions and Properties

STANDARDS

6. EE.A.1, EE.A.2, A.3, A.4, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

6.EE.A.1 - Write and evaluate numerical expressions involving whole-number exponents.

6.EE.A.2 - Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.A.2a - Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5-y.

6.EE.A.2b - Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2(8+7) as a product of two factors; view (8+7) as both a single entity and a sum of two terms.

6.EE.A.2c - Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V=6S^3 and A=6S^2 to find the volume and surface area of a cube with sides of length s=1/2 .

6.EE.A.3 - 1. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression3(2+X) to produce the equivalent expression 6+3X apply the distributive property to the expression 24X +18Y to produce the equivalent expression 6(4x+3y) ; apply properties of operations to y+y+y to produce the equivalent expression 3y.

6.EE.A.4 - 1. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y+y+y and 3y are equivalent because they name the same number regardless of which number y stands for.

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Objectives:

- Evaluate algebraic expressions given values of their variables.
- Write algebraic expressions and solve problems involving algebraic expressions.
- Identify equivalent expressions and apply properties to generate equivalent expressions.
- Apply the Distributive Property to generate equivalent expressions.
- Factor numerical and algebraic expressions.
- Use the distributive property to factor algebraic expressions.
- Write and evaluate algebraic expressions.
- Apply the properties of operations to show expressions are equivalent.

Activities:

1. Have students work in groups and give a number that has 3 as its last number, but that is not divisible by 3. Repeat the process using the number 9. Then ask the students to give 2,3,4,or 5 digit numbers that end in each of the digits from 0 through 9 and that are divisible by 3.

2. Have students work in groups and list ten fractions equal 10/25. Then have groups combined their lists. Repeat the activity with other fractions

Gifted and Talented Activities:

1. Have students find the greatest common factor of a set of numbers by finding the prime
factorization of each number using exponents. Then have them identify any common factors and find the product of the least powers of any common factor identified. Have students use this method to find the greatest common factor of the following sets of numbers.

2. What is the greatest number of prime numbers that can occur in a set of ten consecutive
numbers**?**

3. Have students use calculators to investigate the repeating patterns found in fractions with denominators of 7, 9, and 11. Have them find decimal equivalents for several fractions with the same denominator and use the pattern to find decimal equivalents for other fractions with that denominator.

Chapter 6 - Equations

STANDARDS

6.NS.C.8, EE.A.2, EE.2, EE.3, E.4, B.5, B.6, EE.B.7, EE.C.9 MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

6.EE.B.5 - Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

6.EE.B.6 - Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.EE.B.7 - Solve real-world and mathematical problems by writing and solving equations of the form x+p and px=q for cases in which *p*,q and are all nonnegative rational numbers.

6.EE.C.9 - Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation **d=65t** to represent the relationship between distance and time.

6.NS.C.8 - Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

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Objectives:

- Write equations in one variable and write equations that represent real-life problems.
- Write and solve equations using addition or subtractions.
- Write and solve equations using multiplication and division.
- Write equations in two variables and analyze the relationship between the two quantities.
- Determine if a value is a solution.
- Write and solve one-step equations.
- Write equations in two variables.

Extended Activities:

1. Create a concept map for solving equation; problem/operation with variable/ inverse/ what do I have to put on both sides to get the variable by itself(zero pair).

2. When 3 children go to a movie, the total cost (c) of buying an item for all 3 can be found by using the formula C-3*p, where p is price of an individual item. The price of a candy bar is $2. Use 3 small containers to represent 3*p. Place 2 counters in each container. What is the cost of the 3 candy bars? ($6) To show the cost of three $5 movie tickets, place 5 counters in each of the 3 containers. Use the formula to find the cost of the movie tickets? ($15)

.

3. Have students play this game in pairs. Each student should make up an expression using at least three numbers from 1 through 10 and at least two different operations. The expression must represent a whole number. Parentheses and/or division bars may be used. Have partners exchange papers and find the value. The first student to find the correct value earns a point. Repeat the process 4 times, for a total of 5 rounds.

Gifted and Talented Activities:

1. Miller Car Rental allows 200 free miles. The charges are $35.00 per day, plus $0.30 for every mile over 200. Write a formula to figure the amount charges (c) for driving a car m miles in d days. (C=35d + .30(m-200)

2. Ben wanted to buy a $10 tape, but he did not have that much money. He told Ken, "Lend me the same amount of money as I have, and I **will** buy the tape." Ken agreed, and Ben bought the tape. At a bookstore Ben made the same request, got the loan, and bought a $10 book. Now he has no money left.. How much did he have before the loan for the tape? ($7.50)

3. There are 310 books on a shelf. There are twice as many math books as geography books and 10 more science books than math books. How many of each kind are on the

shelf? (60 geography books, 120 math books, and 130 science books)

Chapter 7 - Area, Surface Area and Volume

STANDARDS

6. EE.A.2c - Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V=6s^3 and A=6s^2 to find the volume and surface area of a cube with sides of length .

6. G.A.1 - Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6. G.A.2 - Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas and to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

6. G.A.4 - Represent three-dimensional figures (e.g., pyramid, triangular prism, rectangular prism) using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

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Objectives:

- Find areas and missing dimensions of parallelograms.
- Find areas and missing dimensions of triangles, and find areas of composite

figures.

- Find areas of trapezoids, kites and composite figures.
- Describe and draw three-dimensional figures.
- Represent prisms using nets to find surface areas of prisms.
- Represent pyramids using nets and use nets to find surface areas of pyramids, triangular prism, rectangular prism. .
- Find volumes and missing dimensions of rectangular prisms.
- Write and evaluate algebraic expressions
- Find the areas of triangles, special quadrilaterals, and polygons.
- Find volumes of prisms with fractional edge lengths.
- Use nets made up of rectangles and triangles to find surface areas.

Activities

1. Have students make a model of an angle by connecting two strips of cardboard with a brass fastener. Then have them position the sides of the angle in different positions to illustrate various sizes of angles.
2. Give students the opportunity to identify various examples of polygons found in books, magazines, or newspapers.

Gifted and Talented Activities:

1. Have students repeat the steps in activities, but have them start with a quadrilateral instead of a triangle. Then ask them to make a generalization.
2. Have students use toothpicks (or pencils) to make the following figure. Then have them move only two toothpicks to from four squares of the same size.

Chapter 8 - Integers, Number Lines, and the Coordinate Plane

STANDARDS

6.NS.C.5 - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

6.NS.C.6 - Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

6.NS.C.6a - Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., , and that 0 is its own opposite.

6.NS.C.6b - Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

6.NS.C.6c - Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

6.NS.C.7 - Understand ordering and absolute value of rational numbers.

6.NS.C.7a - Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret -3.-7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.

6.NS.C.7b - Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3 degrees C > -7 degree C to express the fact that -3 is warmer than -7.

6.NS.C.7c - Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write I-30I = 30 to describe the size of the debt in dollars.

6.NS.C.7d - Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.

6.NS.C.8 - Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

6.EE.B.5 - Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

6.EE.B.6 - Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.EE.B.8 - Write an inequality of the form $x>c$ or $x<c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form or have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

6.G.A.3 - Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

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Objectives:

- Understand the concept of negative numbers and that they are used along a with positive numbers to describe quantities.
- Compare and order integers.
- Compare and order rational numbers.
- Understand the concept of absolute value.
- Plot and reflect ordered pairs in all four quadrants of a coordinate plane.
- Draw polygons in the coordinate plane and find distances between points in the coordinate plane.
- Write inequalities and represent solutions of inequalities on number lines.
- Write and solve inequalities.
- Describe quantities with positive and negative numbers.
- Graph ordered pairs in all four quadrants of the coordinate plane.
- Order integers and absolute value numbers.
- Write and solve one step inequalities
- Represent constraints with inequalities
- Draw polygons in the coordinate planes

Activities:

1. Have students make a list of phrases used in context that denote positive or negative integers. For example, degrees above zero, feel below sea level, pay increase of $2 an *hour*.
2. Work in groups of four, use graph paper and follow these steps. One person draws a triangle on a coordinate plane. The second person translates the triangle 4 units to the right and 3 units up. The third person draws a new triangle on another coordinate plane. The fourth person reflects the triangle across the y-axis.

Gifted and Talented Activities:

1. Have students answer the following questions: name two integers whose product is 10 and whose sum is -7. (-5 and -2). Name two integers whose product is -24 and whose sum is 2 (-4 and 6). Name two integers whose product is -36 and whose sum is 0 (-6 and 6).
2. Have students research the art of M.C. Escher and create their own Escher-like drawing.
3. Have students graph the equations $y=x+2$ and $y=3x$ on the same coordinate axes. Then have them determine the ordered pair of the point where the two graphs intersect.

Chapter 9 Statistical Measures

STANDARDS

6.SP.A.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.

SP.A.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

SP.A.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.

SP.B.4 - Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

SP.B.5 - Summarize numerical data sets in relation to their context, such as by:

SP.B.5a - Reporting the number of observations.

SP.B.5b - Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

SP.B.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.

SP.B.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.

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Objectives:

- Identify statistical questions and use data to answer statistical questions.

- Find and interpret the mean of a data set.
- Find and interpret the median and mode of a data set.
- Find and interpret the range and interquartile range of a data set.
- Find and interpret the mean absolute deviation of a data set.
- Recognize statistical questions as ones anticipating variability.
- Understand that data used to answer statistical questions has a distribution that can be described by center and spread.
- Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, and a measure of variation describes how its values vary with a single number.

- Display data on number lines, including dot plots, stem-and-leaf plot, histograms, and box-and-whisker plots.
    - Use measures of center to summarize all of the values in a data set with a single number, and use measures of variation to summarize how all the values in a data set vary with a single number.

Activities:

1. The three graphs constructed in Explore were vertical bar graphs. Have students work in group to use the same data and draw a horizontal bar graph.

2. Students should work in groups and write down fifteen two-digit numbers. Each group should sort the numbers and create a stem-and-leaf diagram. Have the groups exchange their set of numbers with other groups and then create a new stem-and-leaf diagram.

Gifted and Talented Activities:

1. The Daily Bugle sales of daily newspapers for the first six months of the year were as follows: Jan. 100,000; Feb. 100,100; March 100,200; Apr. 100,250; May 100,350, June 100,500. Have students describe a graph that would convince people that Bugle sales are booming. Then ask students to describe a graph that a competitor might use to convince people that Bugle sales are not doing all that well.

2. Each student should locate a misleading graph in a newspaper or magazine. Then have the students work in groups and analyze the graphs. Their discussion should include identifying the audience to whom the graph is directed, as well as how the graph is

misleading.

3. Have students solve the following problem. For a set of five numbers, the mean is 28, the mode is 24, the median is 28, and the range is 10. Find the five numbers.

Chapter 10 - Data Displays

STANDARDS

6.SP.A.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.

SP.A.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

SP.A.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.

SP.B.4 - Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

SP.B.5 - Summarize numerical data sets in relation to their context, such as by:

SP.B.5a - Reporting the number of observations.

SP.B.5b - Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

SP.B.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.

SP.B.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.

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

Objectives:

- Display and interpret data in stem-and-leaf plots.
- Display and interpret data in histograms.
- Describe and compare shapes of distributions.
- Determine which measures of center and variation best describe a data set.
- Display and interpret data in box-and-whisker plots.
- Understand that data used to answer statistical questions had a distributions that can be described by center, spread, and shape.

- Display data on number lines, including dot plots, stem-and-plot plots, histograms, and box-and-whisker plots.
- Use measures of center to summarize all values in a data set with a single number, and use measures of variation to summarize how all of the values in a data set vary with a single number.
- Choose appropriate measures of center and variation based on shape

Activities:

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