**Teacher(s):** Mrs. Breazeale & Ms. Streeter **Subject/Grade:** 7th /Grade Math **Week of: May 15, 2023**

**Domain:** Statistics & Probability  **Lesson Plan Title:** Virus X +

|  | **Mississippi College and Career Readiness Standards for 7th Grade Mathematics** |
| --- | --- |
| **The Number System** | **7.NS. 1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.**  **7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.**  **7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.** |
| **Statistics & Probability** | **7.SP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if ...**  **7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to ...**  **7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple ...**  **7.SP.4 Use measures of center and measures of variability (i.e. inter-quartile range) for numerical data from random samples to draw informal comparative inferences about two populations**  **7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability ...**  **7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.** |

**ESSENTIAL QUESTION:** How will I use statistical data from a survey to evaluate a variety of data, make inferences, and draw conclusions?

| **Date** | **Day** | **Focus Question** | **Objective** | **I will…** |
| --- | --- | --- | --- | --- |
| **5/15** | **M** | How will I use iReady to enhance my mathematical skills? | TSW choose a lesson on his/her/their path on iReady math and obtain at least one lesson passed and 45 minutes with 80% accuracy. | Use iReady math to enhance my mathematical skills. |
| **5/16** | **T** | How do mathematicians and epidemiologists evaluate and describe statistical data by its distribution on a graph? (Part 1) | TSW evaluate a variety of data and maps to determine while group from the population will transform into a zombie after being infected by Virus X. | -Create dot plots and bar graphs.  -Determine mean and mode.  -Evaluate the usefulness of the measure of central tendency based on the data’s distribution. |
| **5/17** | **W** | How do mathematicians and epidemiologists evaluate and describe statistical data by its distribution on a graph? (Part 2) | TSW evaluate a variety of data and maps to determine while group from the population will transform into a zombie after being infected by Virus X. | -Create dot plots and bar graphs.  -Determine mean and mode.  -Evaluate the usefulness of the measure of central tendency based on the data’s distribution. |
| **5/18** | **R** | How do mathematicians organize and display data on a box plot? | TWS create a dot plot with data given by the teacher. | -Organize and display data on a box plot. |
| **5/19** | **F** | 1)How will I represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams? (3rd & 6th Periods)  2)How will I differentiate between rational and irrational numbers and use this knowledge to solve real-world problems? (2nd, 4th, and 7th periods) | 1)TSW play practice all things compound events by playing Math Prodigy.  2) TSW play practice all things irrational numbers by playing Math Prodigy. | 1)Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams.  2) Differentiate between rational and irrational numbers and use this knowledge to solve real-world problems. |

| **Students** | **REMEDIATION & ENRICHMENT** | **Days** |
| --- | --- | --- |
| **Positive 25** | Students will be provided a remedial lesson on compound probability. | F |
| **Bubbles** | Students will be provided an enrichment lesson on irrational numbers. | F |
| **Top 25** | Students will be provided an enrichment lesson on irrational numbers. | F |

**Monday: May 15, 2023**

**Bell Ringer:** TSW get notebook paper, pencil, calculator, and login to iReady.

**Independent Practice: (~50 minutes)**

*The student will…*

* Complete an iReady lesson on their path. (Most student are placed on 7th grade level.)
* Take notes of important vocabulary and at least 3 examples.
* Listen to the lesson out loud so the teacher knows they are listening.
* Pass at least one lesson and obtain 45 minutes.

**Teacher Interventions:**

*The teacher will…*

* NOT help students with the lesson.
* Only help students on their quiz if they have copied the necessary vocabulary and 3 examples from the lesson.

**Assessment:**  Completed iReady Lesson(s)

**Tuesday: May 16, 2023 and Wednesday: Tuesday: May 17, 2023**

**Lesson Duration: (90 minutes)**

**Printed Materials:** Bell ringer activity & “notes” workspace sheets, Virus X materials

**Materials:** N/A

**Technology:** Promethean Board, Projector

**Pre-Class: (~12 minutes)**

Students will work on their bell ringer assignment and get out the appropriate materials for class.The students will complete one 6th grade review question **(6.SP.1).** The teacher will quickly review the bell ringer questions while students take notes.

**Review:** Quickly review and answer any questions about last night’s homework.

**Anticipatory Set (~5 minutes)**

**Hook:** (Put on dramatic music) Say, “When disease outbreaks or other threats emerge, epidemiologists are on the scene to investigate. Often called “Disease Detectives”, epidemiologists search for the cause of disease, identify people who are at risk, determine how to control or stop the spread or prevent it from happening again. Physicians, veterinarians, scientists, and other health professionals often train to be “Disease Detectives”.

**Real World Connection:** Say, “Like investigators at the scene of a crime, disease detectives begin by looking for clues. They systematically gather information, asking questions such as:

* Who is sick?
* What are their symptoms?
* When did they get sick?
* Where could they have been exposed?
* Using statistical analysis, epidemiologists study answers to these questions to find out how a particular health problem was introduced.

Disease detectives identify new diseases that have never been seen beforehand the organisms that cause them.

Disease detectives use what they learn during the investigation and make recommendations to control the spread or prevent a future occurrence. Does any of this sound familiar?”

**Importance/Relevance:** Who do you think is working on getting the COVID-19 pandemic under control?

**Teaching: Input (~5 minutes)**

*The teacher will…*

* Say, “Today, you all are going to pretend to be epidemiologists investigating a Zombie outbreak in the United States. You will determine where the virus is originating, which patients are likely to become zombies, and which symptoms are the most common.
* I am going to give you a variety of materials to help you with this task, and we will start together.”

**Teaching: Guided (~10 minutes)**

*The teacher will…*

* *Help students get started on this project.*

**Independent Practice: (~25 minutes)**

*The student will…*

* Work on the activity.

**Closure: (~7 minutes)**

* **The teacher will lead a discussion on a reflection of the assignment and how it relates to the world now.**

**Assessment:** Teacher observation

**Thursday: May 18, 2023**

**Lesson Duration: (50 minutes)**

**Printed Materials:** Bell ringer activity & “notes” workspace sheets, ¼ sheets of paper

**Materials:** Student work from Friday

**Technology:** Promethean Board, Projector

**Pre-Class: (~7 minutes)**

Students will work on their bell ringer assignment and get out the appropriate materials for class.The students will complete one 6th grade review question.

**Anticipatory Set (~5 minutes)**

**Hook:**  Say, “The box blot AKA a box and whisker plot was invented in the 1970s by American statistician **John Wilder Tukey**. He was a bright child and both his parents were teachers. As a chemist-turned-topologist-turned statistician, John Wilder Tukey played a key role in the development and study of statistics in the mid 1900's. The field of statistics has benefited tremendously from his contributions. He died in the year 2000, which was not that long ago.”

**Real World Connection:** Say, “This type of graph **is** used to show the shape of the distribution, its central value, and its variability. **Box plots** divide the data into sections that each contain approximately 25% of the data in that set. **Box plots** are useful as they provide a visual summary of the data enabling researchers to quickly identify mean values, the dispersion of the data set, and signs of skewness.”

**Importance/Relevance:**  Say**, “A box plot** is a special type of graph that is used to show groups of number data and how they are spread. It shows the median, which is the middle value of the numbers in your data, the lowest number, the highest number and the quartiles, which divides the data into four equal groups. In other words, a diagram or graph using a number line to show the distribution of a set of data. The diagram displays the median, upper and lower quartiles, and the maximum and minimum values of the data.”

**Teaching: Input (~15 minutes)**

*The teacher will…*

* Instruct students to take notes.
* Step 1: Gather your data. (2, 5, 1, 3, 4)
* Step 2: Organize your data from least to greatest. (1, 2, 3, 4, 5)
* Step 3: Find the median. 3
* Step 4: Find the first and third quartile. We've already found the second quartile of the data set, which is our median. Now we need to find the median of the lower half of the data set; in our example it would be the median of the two numbers to the *left* of 3. The median of 1 and 2 is (1 + 2) / 2 = 1.5. Do the same to find the median of the two numbers to the *right* of 3. (4 + 5) / 2 = 4.5
* Step 5: **Draw a plot line.** This should be long enough to contain all of your data, plus a little extra on either side. Make sure to place the numbers at even intervals. If you're dealing with decimals, such as 4.5 and 1.5, be sure to label them as well.
* Step 6: **Mark your first, second, and third quartiles on the plot line.** Take the values of your first, second, and third quartiles and make a mark at those numbers on the plot line. The mark should be a vertical line at each quartile, starting slightly above the plot line.
* **Step 7: Make a box by drawing horizontal lines connecting the quartiles.** Connect the top or the first quartile to the top of the third quartile, going through the second quartile. Connect the bottom of the first quartile to the bottom of the third quartile, making sure to go through the second quartile
* **Step 8: Mark your outliers.** Find the smallest, and then the largest, numbers in your data set and mark them on the plot line. Mark these points with a small dot. In the case of our example, the lower outlier is 1 and the upper outlier is 5.
* Step 9: **Connect your outliers to the box with a horizontal line.** The straight line that connects the outliers is informally called the "whiskers" of the box and whiskers plot.
* **Step 10: Finished.** Look at a box and whiskers plot to visualize the distribution of numbers in any data set. You can easily see, for example, whether the numbers in the data set bunch more in the upper quartile by looking at the size of the upper box, as well as the size of the upper whisker. Box and whisker plots are great alternatives to bar graphs and histograms

**Teaching: Guided (~15 minutes)**

*The teacher will…*

* Give each student a ¼ of a white sheet of paper.
* Inform students they have 1 minute to write down as many celebrities they can remember. When the timer goes off, instruct students to put their pencils down and flip their paper over.
* Collect these and record results on the board for the students to copy
* Help students create a box and whisker plot with the data.

**Closure: (~7 minutes)**

* The student will complete an exit ticket.

**Assessment:** Teacher observation, exit tickets

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**Friday: May 19, 2023**

**Bell Ringer:** TSW get notebook paper, pencil, calculator, and login to iReady.

**Independent Practice: (~50 minutes)**

*The student will…*

* Complete 30 questions on math prodigy.on their path.
* Take note of any problem requiring two or more steps.
* Utilize the blue light bulb and 2 classmates before asking for help.

**Teacher Interventions:**

*The teacher will…*

* NOT help students unless they have shown work.

**Assessment:**  Completed 30 questions on prodigy.

**Math Standards**

**The Number System:**

**7.NS. 1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

**7.NS.1a** Describe situations in which opposite quantities combine and make 0.

**7.NS.1b** Understand that p + q is the number located a distance from the absolute value of q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0. Interpret sums of rational numbers by describing real-world contexts.

**7.NS.1c** Understand subtraction of rational numbers as adding the additive inverse. Show that the distance between two rational numbers on a number line is the absolute value of their difference, and apply this principle in real-world contexts.

**7.NS.1d** Apply properties of operations as strategies to add and subtract rational numbers.

**7.NS.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

**7.NS.2a** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

**7.NS.2b** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then −p/q = (−p)/q = p/(−q). Interpret quotients of rational numbers by describing real-world contexts.

**7.NS.2c** Apply properties of operations as strategies to multiply and divide rational numbers.

**7.NS.2d** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

**7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers.

**Ratios & Proportions:**

**7.RP** Analyze proportional relationships and use them to solve real-world and mathematical problems.

**7.RP.1** Compute unit rates associated with ratios and fractions, including ratios or lengths, areas and other quantities measured in like of different units.

**7.RP.2** Recognize and represent proportional relationships between quantities.

**7.RP.2a** Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

**7.RP.2b**. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

**7.RP.2c**. Represent proportional relationships by equations.

**7.RP.2d** . Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

**7.RP.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

**Expressions & Equations:**

**7.EE** Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

**7.EE.1**  Apply properties as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

**7.EE.2** Understand that rewriting an expression in different, yet equivalent, forms in a problem can show how the quantities in it are related.

**7.EE.3** Write an expression from a real world context possibly involving sales tax, tip, discount, gratuity, markup, selling price, perimeter, area, and angle measures of a triangle. • Evaluate an expression given a value for the variable. • Translate a verbal expression into an algebraic expression. • Use manipulatives such as algebra tiles to factor expressions.

**7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

**7.EE.4a**  Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

**7.EE.4b** Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

**Geometry:**

**7.G** Draw, construct, and describe geometrical figures and describe the relationships between them.

**7.G.1** Solve problems involving geometric figures, including actual lengths and area of a scale drawing.

**7.G.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

**7.G.3** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

**7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

**7.G.5**. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

**7.G.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

**Statistics & Probability:**

**7.SP.1** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

**7.SP.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.

**7.SP.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability on either team; on a dot plot, the separation between the two distributions of heights is noticeable.

**7.SP.4** Use measures of center and measures of variability (i.e. inter-quartile range) for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.

**7.SP.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

**7.SP.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.

**7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

**7.SP.7a** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.

**7.SP.7b.** Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land opened down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?

**7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

**7.SP.8a** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

**7.SP.8b** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

**7.SP.8c** Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?