



Park Hill School District

Building Successful Futures • Each Student • Every Day

High School SPED Basic Math Curriculum

Course Description: Students in this class will gain a deeper understanding of numbers, how they are expressed and their basic operations. They will also explore a variety of measurement tools and their use as well as practice real-world measurement applications. Finally, students will learn the fundamentals of types of graphs, their parts, and basic graph interpretation.

Scope and Sequence:

Timeframe	Unit	Instructional Topics
40 Days	Number Sense	Topic 1: Basic Operations and Calculator Use Topic 2: Ways of Expressing Numbers Topic 3: Mean, Median, Mode, Range Topic 4: Number Patterns Topic 5: Order of Operations Topic 6: Introduction to Word Problems
35 Days	Measurement	Topic 1: Time Topic 2: Fractions Topic 3: Application of Measurement
5 Days	Graphing	Topic 1: Types of Graphs

Unit 1: Number Sense

Subject: Basic Math

Grade: 9-12

Name of Unit: Number Sense

Length of Unit: 40 days

Overview of Unit: Students gain a deeper understanding of numbers, how they're expressed and their basic operations throughout a series of practically-based and engaging lessons addressing the concepts of: Basic Operations and Calculator Use, Ways of Expressing Numbers, Mean, Median, Mode, and Range, Number Patterns, Order of Operations, and Word Problems.

Priority Standards for unit:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting Standards for unit:

- Alg1.LQE.B.1: **Write arithmetic and geometric sequences in recursive and explicit forms**, and use them to model situations and translate between the two forms.
- Alg1.LQE.B.3: Find the terms of sequences given an explicit or recursive formula.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- ISTE - GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.	Interpret	Analyze	1

Essential Questions:

1. What strategies are used to compute sum, difference, product, and quotient and how do they relate to one another?
2. What are the different ways numbers can be expressed and how is each used practically?
3. How are the concepts of mean, median, mode, and range related to one another?
4. How can arithmetic and geometric sequences be distinguished from one another?
5. What is the correct order of operations when solving an equation, and why is it important to follow?

Enduring Understanding/Big Ideas:

1. The basic operations are addition, subtraction, multiplication, and division; multiplication is repeated addition and division is repeated subtraction.
2. Numbers can be expressed as numerals (i.e., basic operations), written as words (i.e., check-writing), in decimal form (i.e., money), or as percentages (i.e., event likelihood) and are often rounded, as appropriate.
3. Given a set of data arranged in chronological order, the middle-most data point represents the median, while the largest minus the smallest data points represents the range, the sum of the data points, divided by the total number of data points is equivalent to the mean, and the data point(s) recurring the most frequently (when applicable) is/are the mode(s).
4. An arithmetic sequence is a sequence or pattern of numbers, in which each successive number adds the same number to the previous number, while a geometric sequence is a sequence or pattern of numbers, in which each successive number multiplies the same number to the previous number.
5. The correct order of operations is to solve inside parentheses, then solve any exponents, followed by multiplication and division in order from left-to-right, and finally addition and subtraction in order from left-to-right; not following this specific order will result in an incorrect answer.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Pattern Product	Addition Subtraction Multiplication Division Decimal Point Rounding Order of Operations Factor Sequence Pattern Recursive Rule Exponent Mean Median Mode Range Quantity Average

	Distribution Sum Difference Product Quotient Percentage Improper Fraction
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Resources for Vocabulary Development: textbook, online resources

Topic 1: Basic Operations and Calculator Use

Engaging Experience 1

Title: Hop to It!

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting:

- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Solutions to various (simple) problems with one basic operation (+, -, x, or ÷) will be distributed on large index cards around the classroom floor with all desks/chairs moved to the perimeter of the classroom. A list of simple problems with those solutions will be shown (one problem at a time) over the document camera. The first problem's solution should have the same number of solutions as there are students in the class. The second problem's solution should have one fewer solution card, and so on, until the final problem has only one solution card. As students are able to compute problems, using basic operations, they will find and "hop to" the correct solution, in a Musical Chairs-type fashion, eliminating one student each round, until there is ultimately a "winner". This could be done with one operation at a time and then a mixed operation round, allowing for 5 rounds of game play.

Bloom's Levels: Analyze

Webb's DOK: 1

Engaging Experience 2

Title: Relay

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting:

- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- ISTE - GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

Detailed Description/Instructions: Students will divide into groups of 4. Each group will designate the following roles: Solver, Runner, Seeker, and Checker. On the teacher's "Go!", the Solver, located in one setting, will take a task card (previously upside down) off of a table, on which a simple problem including one basic operation is written and solve it. That person will pass the solved problem to the Runner, who will run down the hallway (or other designated area) and tell the Seeker the solution. The Seeker will then search from a large pool of solution cards, until the correct solution is located and given to the Runner. The Runner takes both the problem and the solution to the Checker, who checks the solution using a calculator. If the solution is incorrect, the Runner returns the solution to the Seeker, and the problem to the Solver to try again. If the solution is correct, the Runner runs back to the first classroom area and gives the teacher both the problem and its solution. Correct solutions receive a point. The first team receiving 5 points wins. Once a team has "won", students swap roles on the team and play begins again. This process is repeated until each student has participated in all 4 roles.

Bloom's Levels: Analyze

Webb's DOK: 1

Topic 2: Ways of Expressing Numbers

Engaging Experience 1

Title: Rounding Scoot

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Detailed Description/Instructions: Student desks are arranged in connecting way (rectangle, square, circle). Task cards with whole numbers written on them, with one place value underlined, are placed individually on student desks. Students receive blank answer sheets. A timer is set and students begin at any desk, rounding each whole number to the underlined place value on the answer sheet provided. When the timer sounds, the teacher announces to “scoot” and students move clockwise one desk, repeating the same process at the next desk, until arriving finally back at the desk of origin.

Bloom’s Levels: Analyze

Webb’s DOK: 1

Engaging Experience 2

Title: Silent-o BINGO!

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Detailed Description/Instructions: Each student receives a 5x10 blank BINGO card and a page containing the proper spellings of number words one through one hundred. Students will write-in the words of numbers 1-100 (50 of them) anywhere they choose, randomly, filling their BINGO cards. Once complete, the teacher will draw a number card, written in numeral form, and either write it on the board or project it (rather than saying it verbally). Students will locate the matching number word on their BINGO card when applicable and cover it with a marker, of some sort. Once a student has reached the specified pattern of covered spaces (5 in-a-row, blackout, square, etc.), “BINGO!” is announced and they read their number words aloud to be checked against the numerals. Students may swap BINGO cards and begin again.

Bloom’s Levels: Analyze

Webb’s DOK: 1

Topic 3: Mean, Median, Mode, Range

Engaging Experience 1

Title: M&M Math

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting:

- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- ISTE - GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

Detailed Description/Instructions: Students will receive a bag of M&M's. After sorting their M&M's by color students will write the number of each color in their bag on the board. They will then work together to determine the mean, median, mode and range of the amounts of each color. Students will then place their M&M's back in the bag, roll two dice and, and eat that number of M&M's out of the bag. They will then re-sort the M&M's by color and the process will repeat.

Bloom's Levels: Analyze

Webb's DOK: 1

Engaging Experience 2

Title: Check Your Receipt!

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting:

- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Detailed Description/Instructions: Students either bring receipts from home or are provided with receipts containing five or more items and their prices. Using these, students will determine the mean, median, mode, and range of prices of items purchased at that time.

Bloom's Levels: Analyze

Webb's DOK: 1

Topic 4: Number Patterns

Engaging Experience 1

Title: Watch, Think, Write!

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting:

- Alg1.LQE.B.1: Write arithmetic and geometric sequences in recursive and explicit forms, and use them to model situations and translate between the two forms.
- Alg1.LQE.B.3: Find the terms of sequences given an explicit or recursive formula.

Detailed Description/Instructions: Students will be prepared with paper and a pencil. The teacher will project a pre-timed PowerPoint that shows an arithmetic number sequence, with one number missing and three choices that correlate with letters.

Example: 3, 6, 9, __, 15

[10-A] [11-E] [12-I]

Each slide will show for 1 minute before advancing. Students who correctly solve each number sequence will finish with a phrase written.

Bloom's Levels: Analyze

Webb's DOK: 1

Topic 5: Order of Operations

Engaging Experience 1

Title: Order of Operations Maze

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Detailed Description/Instructions: Students will start with a designated problem, involving multiple operations, with two possible solutions- one that could be reached if the correct order of operations was not employed, the other, the correct answer. Students follow the pathway of the solution they chose to the next problem, completing that problem using order of operations, following that solution to the next problem, and so on, until either the “Finish” is reached, or a dead end, indicating an error, at which point, students should review their solutions.

Bloom’s Levels: Analyze

Webb’s DOK: 1

Topic 6: Introduction to Word Problems

Engaging Experience 1

Title: Solving Word Problems

Suggested Length of Time: 2 days

Standards Addressed

Priority:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting:

- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Detailed Description/Instructions: Teacher will provide problems. Students will solve those on individual white boards so teacher can check for understanding. Beginning with basic examples that involve one step equations. Finally, including problems with two and multi-step equations.

Bloom's Levels: analyze

Webb's DOK: 1

Engaging Scenario

Engaging Scenario:

Students will create their own word problem that will consist of order of operations, number patterns, mean/median/mode/range and place value. Students will then present word problem as the “teacher” to the class. Students will solve word problems together and the “teacher” will go over the answer with the class.

Summary of Engaging Learning Experiences for Topics

Topic	Engaging Experience Title	Description	Suggested Length of Time
Basic Operations and Calculator Use	Hop to It!	Students solve basic operations-based problems, locate the correct solution on the floor, and stand on it, eliminating at least one student each round (musical chairs-style).	1 class period
Basic Operations and Calculator Use	Relay	Students work collaboratively to solve a basic operations-based problem, locate a correct solution, check the solution using a calculator, and submit the team's response for points.	1 class period
Ways of Expressing Numbers	Rounding Scoot	Using task cards supplied at desks, arranged in a rectangle or round, students round numbers to various place values, recording answers on a provided answer sheet, given a specified amount of time for each task card before a timer sounds and it's time to "scoot" clockwise to the next desk.	1 class period
Ways of Expressing Numbers	Silent-o BINGO!	Students write numbers in word form randomly on a provided, 50-space, blank BINGO card, after which the teacher draws from a pool of numerals 1-100 and without saying each verbally, shows the class the numbers, until a student has achieved the designated pattern of number words covered.	1 class period
Mean, Median, Mode, Range	M&M Math	Students sort a bag of M&M's by color, recording the number of each on the board. Collectively, they solve for the mean, median, mode, and range of each color among the whole class.	1 class period

Mean, Median, Mode, Range	Check Your Receipt!	Using receipts for five or more items, students determine the mean, median, mode and range of the prices of the items purchased at that time.	1 class period
Number Patterns	Watch, Think, Write!	Students will be shown a series of arithmetic rules and geometric sequences with a single number missing and three options to select from, the correct choices will lead to the ability to correctly decipher a coded phrase	1 class period
Order of Operations	Order of Operations Maze	Students will work their way through a maze using the order of operations in order to reach the “Finish” and reworking/making corrections if reaching a “dead end”.	1 class period
Introduction to Word Problems	Word Problem Practice	Students practice solving practically based word problems using individual white boards.	2 class periods

Unit 2: Measurement

Subject: Basic Math

Grade: 9-12

Name of Unit: Measurement

Length of Unit: 35 days

Overview of Unit: Students will explore a variety of measurement tools and their use as well as having the opportunity to practice real-world measurement applications such as time management and multiplying fractions of ingredients for a recipe.

Priority Standards for unit:

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.
 - a. Identify, label and use appropriate **units of measure** within a problem.
 - b. Convert units and rates.
 - c. **Use units within problems.**
 - d. Choose and interpret the scale and the origin in graphs and data displays.

Supporting Standards for unit:

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.
- Alg1.NQ.B.3: Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- ISTE - GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
units of measure as a way to understand and solve problems involving quantities.	Use	Apply	1
appropriate units of measure within a problem.	Identify	Remember	1
appropriate units of measure within a problem.	Label	Remember	1
appropriate units of measure within a problem.	Use	Apply	1
units and rates.	Convert	Apply	1

units within problems.	Use	Apply	1
the scale and the origin in graphs and data displays.	Choose	Remember	1
the scale and the origin in graphs and data displays.	Interpret	Understand	1

Essential Questions:

1. How does the ability to measure time impact everyday success?
2. Why is understanding fractions important for daily independent living?
3. Why is it important to understand the various types of measurement and how can they be applied to daily life?

Enduring Understanding/Big Ideas:

1. The ability to measure time, including the various forms of elapsed time, allows for effective daily scheduling.
2. Fractions are fundamental to many daily functions, from following a recipe to paying bills.
3. Understanding different forms of measurement is essential to achieving accuracy and communicating clearly; practical applications range from self-care (i.e., weight management) to interior decorating (i.e., finding area in order to carpet a room).

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Conversion	Elapsed Time Duration Fraction Conversion Improper Fraction Mixed Number Measurement Weight Mass Area Volume Circumference Fraction Numerator Denominator

Resources for Vocabulary Development: textbook, online resources

Topic 1: Time

Engaging Experience 1

Title: Saturday Scheduling (determining end time)

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.

Supporting:

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.
- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Detailed Description/Instructions: Students are given various hypothetical Saturday scenarios involving activities, start times, and durations that they can choose from to participate in with their friend, but there is one rule- they can't break curfew, which is 10:00pm, sharp! Students must choose at least three activities to participate in and the end time of one may not overlap with the start time of another. No curfew extensions will be honored.

Bloom's Levels: Apply

Webb's DOK: 1

Engaging Experience 2

Title: Don't be Late for your Date! (determining start time)

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.

Supporting:

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.
- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Detailed Description/Instructions: Students brainstorm everything necessary to complete prior to going on a date on a Saturday night and the approximate amount of time each would take (i.e., go shopping for new clothes- 2 hours, fill up gas tank- 10 minutes, go to ATM- 5 minutes, take a shower- 15 minutes, walk the dog- 30 minutes, go to work- 3 hours, Church- 1 hour, etc.). From there, students will write that they are supposed to pick-up their date at 6:00pm and need to complete each item that they brainstormed prior to that. The goal is to work backward from 6:00pm to determine the start time for each activity.

Bloom's Levels: Apply

Webb's DOK: 1

Engaging Experience 3

Title: Whatchya Gonna Do? (determining elapsed time/duration)

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.

Supporting:

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.
- ISTE - GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Detailed Description/Instructions: Students work in pairs and are given two stacks of cards, labeled with times, upside down, and cards labeled with various activities, face-up on their desks. One student draws a time card from one pile, while one student draws another time. Together, they determine the duration between the two times drawn and then find an activity from those available that could reasonably be completed in that amount of time.

Bloom's Levels: Apply

Webb's DOK: 1

Topic 2: Fractions

Engaging Experience 1

Title: Skittle Scatter

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.

Supporting:

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.

Detailed Description/Instructions: Students will each receive a standard bag of Skittles candy. Upon opening their bag of Skittles, they'll sort them by color and answer the following questions:

- ★ How many Skittles are in the “whole” bag?
 - What fraction of your Skittles are red?
 - What fraction of your Skittles are green?
 - What fraction of your Skittles are yellow?
 - What fraction of your Skittles are orange?
 - What fraction of your Skittles are purple?
 - What fraction of your Skittles are brown?
 - What fraction of your Skittles are NOT orange?
 - What fraction of your Skittles are yellow OR orange?
- ★ Think about a bag of 20 Skittles
 - How much would $\frac{1}{2}$ of the bag be?
 - How many Skittles would $\frac{1}{4}$ of the bag be?
 - How many would $\frac{3}{4}$ of the bag be?
 - How many would $\frac{1}{10}$ of the bag be?
- ★ What if the bag had 24 Skittles Skittles...
 - How much would $\frac{1}{3}$ of the bag be?
 - What about $\frac{5}{8}$?
 - What about $\frac{1}{12}$?
- ★ What if the bag had 25 Skittles...
 - How much would $\frac{1}{5}$ of the bag be?
 - What about $\frac{2}{5}$?
 - What about $\frac{3}{5}$?

Bloom's Levels: Apply

Webb's DOK: 1

Engaging Experience 2

Title: Fraction Battle

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.

Supporting:

- Alg1.NQ.B.3: Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students are given a deck of “cards” comprised of different fractional amounts. In pairs, students each flip over one card and whoever’s fraction is a larger amount (i.e., $\frac{7}{12} > \frac{3}{10}$), takes both cards. Play continues (in the same style as the game of war) until one student has all of the cards. This can be done in a “bracket” or tournament fashion, so there is one final victor of Fraction Battle.

Bloom’s Levels: Apply

Webb’s DOK: 1

Engaging Experience 3

Title: Fraction Bowling

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.

Supporting:

- Alg1.NQ.B.3: Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- ISTE - GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: A standard set of 12 bowling pins is set-up in the classroom and an indoor (rubber) bowling ball is used for students to bowl. The class is divided into two teams and each is given a score reporting sheet with 10 frames. As in standard bowling, students get two rolls per turn and then report how many pins they knocked down, in a fraction $\#/12$ format. Following each turn, students will add their own fractional scores to arrive at a current score. When the final team member has bowled, the entire team will add their scores together and compare their total fractional score to the other team's to see who won.

Bloom's Levels: Apply

Webb's DOK: 1

Topic 3: Application of Measurement

Engaging Experience 1

Title: Go Long!

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.

Supporting:

- Alg1.NQ.B.3: Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students pair-up and take painter's/masking tape, a marker, and a meter stick to the hallway or other large, open area. Students then lay down a very long, straight line of tape and one student jumps from a standing position as far as he/she can down the line of tape. Their partner marks their landing location with a "1", "2", and "3". That student then uses the meter stick to measure the length of his/her jumps from the starting point to each of the three ending points and records them accordingly, circling the furthest distance. The students then switch roles and repeat the same process.

Bloom's Levels: Apply

Webb's DOK: 1

Engaging Scenario

Engaging Scenario (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Situation: High school students are always hungry.

Challenge: Students will work together to plan a whole-class meal, from recipes that are most typically written to yield servings of 4-6.

Specific Roles: Planners, Shoppers, Cookers, Servers

Audience: Teacher, Classmates

Product/Performance: “Planners” will find recipes for menu items the class has determined will be part of the meal. Planners will be responsible for changing the recipe, as necessary, to accommodate the number of people eating. “Shoppers” will go to the store, ensuring they purchase enough of each ingredient to fulfill the recipe requirement. The “Cookers” will accurately use measuring cups/spoons to create the dishes. The “Servers” will monitor the duration and stop time, and divide the meal equally amongst those eating, so that there is enough for everyone.

Summary of Engaging Learning Experiences for Topics

Topic	Engaging Experience Title	Description	Suggested Length of Time
Time	Saturday Scheduling	Selecting a reasonable schedule of events, based on determination of end times	1 class period
Time	Don't be Late for your Date!	Backward chaining a series of events, determining start times, based on a desired end time	1 class period
Time	Whatchya Gonna Do?	Solving for an elapsed time and selecting an activity that could be reasonably completed	1 class period
Fractions	Skittle Scatter	Based on the different numbers of Skittle's in students' packages, they answer fraction-based questions	1 class period
Fractions	Fraction Battle	Determining which of two fractions (typically not with common denominators) is larger	1 class period
Fractions	Fraction Bowling	Students record bowling scores as fractions /12 pins and culminate team total, comparing to rival team to determine "winners"	1 class period
Application of Measurement	Go Long!	Students jump three distances and measure each with a meter stick, determining and designating which was longest	1 class period

Unit 3: Graphing

Subject: Basic Math

Grade: 9-12

Name of Unit: Graphing

Length of Unit: 5 days

Overview of Unit: Students learn the fundamentals of types of graphs, their parts, and basic graph interpretation through a series of engaging learning activities.

Priority Standards for unit:

- Alg1.DS.A.1: Analyze and interpret graphical displays of data.

Supporting Standards for unit:

- Alg1.IF.B.1: **Using tables, graphs and verbal descriptions, interpret key characteristics** of a function that models **the relationship between two quantities**.
- Alg1.IF.B.3: **Determine the average rate of change** of a function over a specified interval and interpret the meaning.
- Alg1.IF.C.1: **Graph** functions expressed symbolically and **identify and interpret key features of the graph**.
- Alg1.DS.A.3: Interpret differences in shape, center and spreads in the context of the data sets, accounting for possible effects of outliers.
- Alg1.DS.A.4: Summarize data in two-way frequency tables.
 - Interpret relative frequencies in the context of the data.
 - Recognize possible associations and trends in the data.
- Alg1.DS.A.6: **Interpret the slope** (rate of change) and the y-intercept (constant term) of a linear model in the context of the data.

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Understand	1

Essential Questions:

- How can data be represented graphically?
- What are the most important parts of a graph and why is each so important?
- How are graphs used in everyday life?

Enduring Understanding/Big Ideas:

1. Graphs can be constructed using bars, lines, parts of a circle/pie, or pictures/symbols.
2. The title of the graph tells what the data is communicating, the label on the x-axis informs the reader what change is occurring along that axis, as does the label on the y-axis, and the key (when applicable) informs the reader what various symbols/colors represent on the graph.
3. The stock market is one example of where graphs are frequently read and interpreted, as well as in most business and sales-based jobs.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Title	Title Axis Data Scale Outlier Symmetry Horizontal Vertical Key Line Graph Bar Graph Pictograph Pie Chart

Resources for Vocabulary Development: textbook, online resources

Topic 1: Types of Graphs

Engaging Experience 1

Title: Introduction of a bar graph

Suggested Length of Time: 1 day

Standards Addressed

Priority:

- Alg1.DS.A.1: Analyze and interpret graphical displays of data.

Supporting:

- Alg1.IF.C.1: **Graph** functions expressed symbolically and **identify and interpret key features of the graph.**
- Alg1.IF.B.1: **Using tables, graphs and verbal descriptions, interpret key characteristics** of a function that models **the relationship between two quantities.**
- TT.AB.I.1: Students will develop positive social identities based on their membership in multiple groups in society.
- TT.AB.I.3: Students will recognize that peoples' multiple identities interact and create unique and complex individuals.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- TT.AB.D.7: Students will develop language and knowledge to accurately and respectfully describe how people (including themselves) are both similar to and different from each other and others in their identity groups.
- TT.AB.D.8: Students will respectfully express curiosity about the history and lived experiences of others and will exchange ideas and beliefs in an open-minded way.
- TT.AB.D.9: Students will respond to diversity by building empathy, respect, understanding and connection.
- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Detailed Description/Instructions: Students will print off pictures of their face and place a magnet on the back. On the dry erase board the teacher will propose multiple questions with a variety of answers. For example: what is your favorite animal? Options for answers: Bear, dog, cat, bird, tiger, snake, dolphin, shark. Students will place their magnets on the corresponding favorite answer. Then, the teacher will make a bar graph on the board as a whole class. Next the students will create their own question and optional answers for the class. Each student will take turns asking the question, waiting for students' responses, and then making a bar graph with all the necessary labeled parts (title, x and y intercepts, color coded, and numbers identifying students' interests).

Bloom's Levels: Understand

Webb's DOK: 1

Engaging Experience 2

Title: Graph Interpretation

Suggested Length of Time: 1 class period

Standards Addressed

Priority:

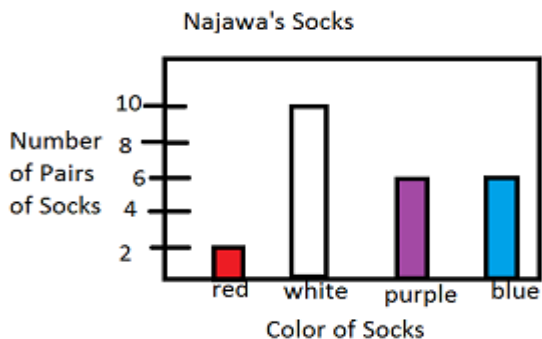
- Alg1.DS.A.1: Analyze and interpret graphical displays of data.

Supporting:

- Alg1.IF.C.1: **Graph** functions expressed symbolically and **identify and interpret key features of the graph.**
- Alg1.IF.B.1: **Using tables, graphs and verbal descriptions, interpret key characteristics** of a function that models **the relationship between two quantities.**
- TT.AB.I.1: Students will develop positive social identities based on their membership in multiple groups in society.
- TT.AB.I.3: Students will recognize that peoples' multiple identities interact and create unique and complex individuals.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- ISTE - KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Detailed Description/Instructions: Students will walk around the classroom/hallway answering questions about the posted graphs.

For example:



What is the X-intercept of this graph?
What is the Y-intercept of this graph?
What is the title of this graph? Which color of sock is the most popular? What color of sock is the least popular? What is the mean of all of the pairs of socks?

Bloom's Levels: Understand

Webb's DOK: 1

Engaging Scenario

Engaging Scenario

Students will choose 3 different types of surveys to produce. Students will pick questions such as: What is your favorite fast food chain? What is your favorite sport? Who do you think will win this year's Super Bowl? Etc. Students will use class time to walk around the school independently and ask teacher/students/administration to participate in their survey. Teacher will need to remind students of the social behavior that is expected in the hall and how to address someone in a professional manner. Students will come back to the classroom once they have gained 10 answers per survey. They will then make three different graphs for each survey and label the graphs correctly. Students will find the mean, median, and mode for their graphs. Students will present their graphs to the class.

Summary of Engaging Learning Experiences for Topics

Topic	Engaging Experience Title	Description	Suggested Length of Time
Types of Graphs	Introduction of the Types of graphs	The students will make their own question to be surveyed, then make a graph of their choice to represent the data.	1 class period
Types of Graphs	Graph Interpretation	Students will identify the parts of a graph and be able to interpret the data on various types of graphs.	1 class period

Unit of Study Terminology

Appendices: All Appendices and supporting material can be found in this course's shell course in the District's Learning Management System.

Assessment Leveling Guide: A tool to use when writing assessments in order to maintain the appropriate level of rigor that matches the standard.

Big Ideas/Enduring Understandings: Foundational understandings teachers want students to be able to discover and state in their own words by the end of the unit of study. These are answers to the essential questions.

Engaging Experience: Each topic is broken into a list of engaging experiences for students. These experiences are aligned to priority and supporting standards, thus stating what students should be able to do. An example of an engaging experience is provided in the description, but a teacher has the autonomy to substitute one of their own that aligns to the level of rigor stated in the standards.

Engaging Scenario: This is a culminating activity in which students are given a role, situation, challenge, audience, and a product or performance is specified. Each unit contains an example of an engaging scenario, but a teacher has the ability to substitute with the same intent in mind.

Essential Questions: Engaging, open-ended questions that teachers can use to engage students in the learning.

Priority Standards: What every student should know and be able to do. These were chosen because of their necessity for success in the next course, the state assessment, and life.

Supporting Standards: Additional standards that support the learning within the unit.

Topic: These are the main teaching points for the unit. Units can have anywhere from one topic to many, depending on the depth of the unit.

Unit of Study: Series of learning experiences/related assessments based on designated priority standards and related supporting standards.

Unit Vocabulary: Words students will encounter within the unit that are essential to understanding. Academic Cross-Curricular words (also called Tier 2 words) are those that can be found in multiple content areas, not just this one. Content/Domain Specific vocabulary words are those found specifically within the content.