SPARTA TWP. PUBLIC SCHOOLS

Grade 7 Mathematics Curriculum

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Adapted from:
New Jersey Student Learning Standards

Reviewed by:
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Sparta Township School District

18 Mohawk Avenue
Sparta, NJ 07871
www.sparta.org

VISION

The Sparta School district believes that the Sparta school system produces students who will exemplify mastery in mathematical practices. It is the responsibility of administrators, teachers, students, and parents to create learning opportunities to persevere in modeling mathematics precisely and strategically with reasoning, tools, and algebraic structure. Through this collaboration, students will develop into independent, competent, mathematical thinkers who are college and career ready.

BELIEF STATEMENTS

- Technology can enhance the learning process and prepare students to be 21st century learners.
- Student-centered learning activities will enable students to develop ownership for their education.
- A coherent K-12 curriculum will allow for authentic real-world learning opportunities.
- Our assessments will require students to demonstrate in-depth understanding rather than recalling simple facts and algorithms.
- Students will be confident in participating in higher level discussions that will assess and advance the understanding of concepts.
- The use of various resources, tools, and technology will engage students to solve mathematically rich, real-world problems that meet the needs of a diverse population of learners.
- Collaborative and hands-on learning activities will promote creative and critical thinking skills for all students.

COURSE OVERVIEW

The Sparta School District Math 7 program has been constructed within a multi-faceted, standards-based Philosophy. In this course, students will extend their knowledge of equations and functions to manipulate equations using properties of operations and model and solve real-world problems. Students will develop an understanding of linear, quadratic, and exponential equations and extend this thinking to include systems of equations.

COMPONENTS OF THE COURSE

The Components of a successful Pre-Algebra program are:
- Learnzillion
- Illustrative Mathematics
- EngageNY

SCOPE AND SEQUENCE
(Pacing Guide)

Weeks Taught (40 Total)	Units of Study
3	All integer operations
3	Adding and subtracting Rationals
3	Multiplying and Dividing Rationals
3	Expressions
3	Equations
3	Inequalities
3	Ratios and Proportionality
4	Percents
3	Triangles and Angles
3	Area, Perimeter and Circumference
3	Surface Area, Volume, Cross Sections
3	Measures of Central Tendency and Data Displays
2	Sampling
2	Probability

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 1:	Integers		

UNIT SUMMARY

Integers represent positive and negative numbers on the number line. In this unit, students will understand and compute with integers using contexts such as temperature, elevation, and banking. Students will graph integers on a number line and recognize absolute value as the distance a number is from zero. Students will perform mathematical operations with integers and solve problems that represent real world situations.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition/subtraction on a horizontal or vertical number line diagram.
- 7.NS.1.A: Describe situations in which opposite quantities combine to make 0.
- 7.NS.1.B: Understand $p+q$ as the number located a distance $|q|$ 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 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
- 7.NS.1.C: Understand subtraction of rational numbers as adding the additive inverse, $p-q=p+(-q)$. Show the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
- 7.NS.1.D: Apply properties of operations as strategies to add and subtract rational numbers.
- 7.NS.A.2: Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers.
- 7.NS.A.2.A: 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.A.2.B: 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.A.2.C Apply properties of operations as strategies to multiply and divide rational numbers.
- 7.NS.A.2.D 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.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 1.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through

larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Students will understand that: ● How can we use rational number operations in the real world? ● Numbers can be represented in various forms and it can be useful to rewrite numbers and expressions to better understand a problem.	● How do you operate with all rational numbers? ● How can the properties of real numbers shed light on a problem?

UNIT LEARNING TARGETS (Students will know how to…)

● Recognize the opposites of numbers
● Recognize that the opposite of the opposite of a number is the number itself
● Use positive and negative numbers to represent real-world contexts
● Understand the value of 0 in real-world contexts
● Understand absolute value of a number as its distance from 0 on the number line
● Compare the absolute value of numbers
● Find the distance between points in the coordinate plane with the same first or the same second coordinate
● Add and subtract integers
● Multiply and divide integers
● Understand that integers can be divided (with a non-zero divisor) and that the quotient is a rational number
● Solve real world problems with integer operations

LEARNING ACTIVITIES: (Students will be able to…)

● Students will make sense of number line models to develop an understanding of opposite numbers and absolute value.
● Students will attend to the precision of their solutions when calculating integer computations
● Students will use number line models to represent the sum and differences of integers
● Justify algorithms for integer operations through the exploration of repeated problems
● Persevere in solving real world problems involving integer operations

EVIDENCE OF LEARNING:		
FORMATIVE ASSESSMENTS	**SUMMATIVE ASSESSMENTS**	**ALTERNATIVE ASSESSMENTS**
● Opposites and Absolute Value ● Addition and Subtraction of Integers ● Multiplication and Division of Integers ● Integer Word Problems	District Summative Assessment Math 7 Unit 1	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities
INSTRUCTIONAL MATERIALS/RESOURCES		**TECHNOLOGY RESOURCES**
● Classroom Laptop Set ● LearnZillion ● Illustrative Mathematics ● Youtube ● EngageNY ● District Task Resources		Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

[Sparta Twp. Public Schools Differentiation Strategies](#)

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 2:	Adding and Subtracting Rationals		

UNIT SUMMARY

In this unit students will extend their understanding of adding and subtracting integers to all positive and negative rational numbers. Students will apply these concepts to both decimals and fractions. Students will justify number operations through the understanding of the number line and previously learned integer operations. Students will explore the opposites and absolute values of all rational numbers and develop an understanding of all numbers places on the number line. Students will represent real world situations with all rational numbers and solve problems involving real world contexts.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition/subtraction on a horizontal or vertical number line diagram.
- 7.NS.1.A: Describe situations in which opposite quantities combine to make 0.
- 7.NS.1.B: Understand $p+q$ as the number located a distance $|q|$ 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 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
- 7.NS.1.C: Understand subtraction of rational numbers as adding the additive inverse, $p-q=p+(-q)$. Show the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
- 7.NS.1.D: Apply properties of operations as strategies to add and subtract rational numbers.
- 7.NS.A.3: Solve real-world and mathematical problems involving the four operations with rational numbers.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 2.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● How can we use rational number operations in the real world? ● Numbers can be represented in various forms and it can be useful to rewrite numbers and expressions to better understand a problem.	● Do all rational numbers have places on the number line? ● Do all rational numbers have opposites and absolute value? ● How can the properties of real numbers help to rewrite a problem?

UNIT LEARNING TARGETS (Students will know how to...)

- Plot rational numbers and their opposites on the number line
- Use the number line to develop an understanding of absolute value
- Solve problems involving addition and subtraction of fractions and decimals
- Recognize when it is important to round up or round down answers based on the context of a problem
- Recognize that operations with rational numbers can be written in different forms using properties of numbers

LEARNING ACTIVITIES: (Students will be able to...)

- Students will make sense of and persevere solving decimal and fraction addition and subtraction problems relating signed rationals to integer operations
- Students will attend to the precision of their solutions, understanding that positive and negative solutions are opposite numbers, and are not equivalent
- Students will look for structure in their problem solving to develop the ability to check their solutions for reasonableness
- Students will look for repetition in their calculations to develop general methods for problem solving

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Opposites and Absolute Value ● Adding/Subtracting Decimals ● Adding/Subtracting Fractions ● Problem Solving with Fractions/Decimals ● Decimals and Fractions in real world contexts	● District summative assessment: Math 7- Unit 2	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	:Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

[Sparta Twp. Public Schools Differentiation Strategies](#)

TEACHER NOTES:

CONTENT AREA:	Math	GRADE LEVEL	7
UNIT 3:	Unit 3 Multiplying and Dividing Rationals		

UNIT SUMMARY

In this unit students will extend their understanding of multiplying and dividing with integers to all positive and negative rational numbers. Students will apply these concepts to both decimals and fractions. Students will justify number operations through the understanding of the number line and previously learned integer operations. Students will represent real world situations with all rational numbers and solve problems involving real world contexts.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.NS.A.2: Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers.
- 7.NS.A.2.A: 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.A.2.B: 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.A.2.C: Apply properties of operations as strategies to multiply and divide rational numbers.
- 7.NS.A.2.D 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.A.3: Solve real-world and mathematical problems involving the four operations with rational numbers.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 3.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● How can we use rational number operations in the real world? ● How can our solutions be interpreted to be logical based on the context of a given problem? ● Numbers can be represented in various forms and it can be useful to rewrite numbers and expressions to better understand a problem.	● How do you operate with all rational numbers? ● How can the properties of real numbers shed light on a problem? ● What does it mean for a number to be rational?

UNIT LEARNING TARGETS (Students will know how to…)

● Identify numbers as rational
● Compute all operations with rational numbers
● Convert between fraction and decimal forms of a number
● Solve problems involving the four operations with rational numbers
● Recognize when it is important to round up or round down answers based on the context of a problem
● Recognize that operations with rational numbers can be written in different forms using number operations

LEARNING ACTIVITIES: (Students will be able to…)

● Make sense of decimal and fraction multiplication and division and persevere in solving problems, especially long division in decimal problems.
● Construct arguments as to which operation would be needed to solve a real world problem, critiquing the reasoning of self and peers.
● Decide on the reasonableness of a problems solution in relation to the context provided.
● Show an understanding of the need for precision in problem solutions, whether it be simplest form and positive or negative values in computation, or the need for whole numbers in contextual problems

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Multiplying/Dividing Decimals ● Multiplying/Dividing Fractions ● Problem solving with decimals/fractions	District Summative Assessment: Math 7- Unit 3	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 4:	Unit 4 Expressions		

UNIT SUMMARY

In this unit, students learn to write, understand, and evaluate algebraic expressions. Students understand that variables are symbols that represent numbers and that expressions can be manipulated using the properties of operations. Equivalent expressions can be written and may be necessary depending on the context of a particular problem

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- 7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how quantities in it are related

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CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS
8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS
Science: Students will make connections based on topics presented in unit 4.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● Variables are symbols that represent numbers. ● Words can be translated into numerical expressions. ● Mathematical symbols can be used to represent different situations both numerically and algebraically.	● How can we translate a verbal expression into a numerical expression? ● How can we translate a numerical expression into a verbal expression? ● How do we simplify expressions? ● How are mathematical symbols used to represent situations? ● What makes expressions equivalent?

UNIT LEARNING TARGETS (Students will know how to…)
● Simplify algebraic expressions

- Identify parts of an expression using mathematical terms
- Apply the properties of operations to generate equivalent expressions
- Identify when two expressions are equivalent
- Use variables to represent numbers and write expressions to solve real-world or mathematical problems
- Understand that a variable can represent any unknown value
- Rewrite expressions in different forms using the distributive property to shed light on the context of a problem

LEARNING ACTIVITIES: (Students will be able to…)

- Use area models to show an understanding of the distributive property
- Look for structure in simplifying expressions to develop an understanding of the distributive property and its effect on expressions
- Look for patterns when simplifying expressions to create equivalent expressions
- Reason abstractly whether two expressions will be equivalent

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
- Parts of expressions - Simplifying Expressions by combining like terms - Simplifying Expressions with the distributive property and combining like terms - Creating Equivalent Expressions	District Summative Assessment: Math 7- Unit 4	- IXL - Student Presentation - Teacher Observation - Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 5:	Unit 5 Equations		

UNIT SUMMARY

In this unit, students combine their work with integer operations and expressions to solve equations. To start, students work with one-step equations. Work is then extended to include two step equations, including equations involving parentheses and the distributive properties. Students use selected variables to write and then solve equations in real-world contexts.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.EE.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
- 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.

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CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

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8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 5.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Students will understand that: ● The same number can be added or subtracted from both sides of an equation and not change the equality. ● Multiplying or dividing both sides of an equation by the same nonzero number does not change the equality.	● How do we solve algebraic equations? ● How can we represent real world situations with equations? ● Do equations always have exactly one solution?

- Solving an equation involves finding the value of the unknown that makes the equation true.
- There is more than one way to solve an equation.
- The order of operations must be considered when solving an equation.

UNIT LEARNING TARGETS (Students will know how to…)

- Determine which values from a specified set make an equation true
- Use substitution to determine whether a given number makes an equation true
- Identify the operations used to simplify each step of an equation
- Solve one-step equations
- Solve two-step equations
- Solve multi-step equations
- Check solutions to equations by plugging value into original equation
- Use variables to represent numbers when writing and solving an equation
- Solve real-life problems by writing and solving an equation
- Check for reasonableness of answers

LEARNING ACTIVITIES: (Students will be able to…)

- Understand equality and the ability to manipulate equations to solve for an unknown variable
- Use technological tools like algebra balance beams and equation editor to solve equations
- Determine what it means for an equation to not have a solution be attending to the precision of their answers
- Use the patterns and structure of equations and equality to develop strategies for solving multi-step equations.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
- One and Two Step Equations - Multi-Step Equations - Writing equations to represent real world situations	District Summative Assessment: Math 7- Unit 5	- IXL - Student Presentation - Teacher Observation - Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics	Interactive Whiteboard Classroom Laptop Set LearnZillion

Youtube EngageNY	Illustrative Mathematics Youtube EngageNY District Task Resources
DIFFERENTIATION:	
[Sparta Twp. Public Schools Differentiation Strategies](#)	
TEACHER NOTES:	

CONTENT AREA:	Math	GRADE LEVEL	7
UNIT 6:	Unit 6: Inequalities		

UNIT SUMMARY

In this unit, students will extend their knowledge of solving equations to solve and graph inequalities. Students will recognize that, while the process of solving is similar, solutions to inequalities are typically sets of numbers as opposed to single solutions.

NEW JERSEY STUDENT LEARNING STANDARDS

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

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 6.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Students will understand that: ● The same number can be added or subtracted from both sides of an inequality and not change the equality. ● Multiplying or dividing both sides of an inequality by the same positive number does not change the equality. ● Multiplying or dividing both sides of an inequality by the same negative numbers changes the inequality. ● Solving an inequality involves finding the	● How do the graphs of single variable inequalities represent the solution set? ● How is solving an inequality similar to or different than solving an equation?

set of values that make the inequality true. • The order of operations must be considered when solving an inequality.	

UNIT LEARNING TARGETS (Students will know how to…)

● Determine which values make an inequality true
● Use substitution to determine whether a given number is part of the solution set of an inequality
● Identify the operations used to simplify each step of an inequality
● Solve and graph one-step inequalities
● Solve and graph two-step inequalities
● Solve and graph multi-step inequalities
● Use variables to represent numbers when writing and solving an inequality
● Solve real-life problems by writing and solving an inequality
● Check for reasonableness of answers

LEARNING ACTIVITIES: (Students will be able to…)

- Students will make sense of real world situations and how constraints relate to specific inequality symbols
- Students will model real world situations on a number line, paying specific attention to symbols
- Students will attend to precision within the number line diagrams used to model the inequality and the words used to represent the symbols that model the inequality.
- Students will reason abstractly and quantitatively by writing and solving inequalities to represent real world situations.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Solving inequalities ● Graphing Inequalities ● Representing and solving real world problems with inequalities	District Summative Assessment: Math 7- Unit 6	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
	Interactive Whiteboard Classroom Laptop Set

Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	LearnZillion Illustrative Mathematics Youtube EngageNY District Task Resources
DIFFERENTIATION:	
[Sparta Twp. Public Schools Differentiation Strategies](#)	
TEACHER NOTES:	

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 7:	Unit 7 Ratios and Proportionality		

UNIT SUMMARY

In this unit, students will compute unit rates involving complex fractions. They will be introduced to the concept of proportionality by writing and solving proportions to represent real world problems. Students will work with the constant of proportionality in various forms and demonstrate proportional relationships in tables, graphs, equations and scale drawings.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
- 7.RP.A.2 Recognize and represent proportional relationships between quantities.
- 7.RP.A.2.A 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.A.2.B Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- 7.RP.A.2.C Represent proportional relationships by equations.
- 7.RP.A.2.D 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. G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

21st CENTURY LIFE AND CAREER READY PRACTICES

 CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 7.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● Proportional reasoning is essential in problem solving ● Understanding mathematical relationships allows us to make predictions, calculate and model unknown quantities. ● Proportional relationships express how quantities change in relationship to each other. ● Scale factor is proportional and can be found in the real world.	● How do quantities change in relation to each other? ● How do we use proportional relationships to solve real world problems? ● How is scale factor used in the real world? ●

UNIT LEARNING TARGETS (Students will know how to…)

● Compute unit rates associated with complex fractions
● Decide whether two quantities are in a proportional relationship
● Identify the constant of proportionality in tables, graphs and equations
● Solve problems involving scale drawings using proportional reasoning

LEARNING ACTIVITIES: (Students will be able to…)

● Students will reason abstractly and quantitatively by writing and solving proportions to represent real world situations.
● Students will look for and make use of structure to look for properties to set up and solve proportions
● Students will use tools strategically to model scale factor within scale drawings
● Students will attend to precision with units and measurements in scale drawings
● Students will model proportional relationships using equations, tables ,and graphs and scale factor using pictures.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Unit rates with complex fractions ● The constant of proportionality ● The COP in various forms ● Scale Factor and Scale Drawings	● District Summative Assessment: Math 7-Unit 7	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7

UNIT 8:	Unit 8 Percents

UNIT SUMMARY

In this unit students will be introduced to the concept of percents and how they apply in the real world. They will use their knowledge of proportional relationships to understand percents are always equivalent to a number out of 100. Students will solve real world problems and write expressions to represent percents in the real world in various ways.

NEW JERSEY STUDENT LEARNING STANDARDS

7.RP.A.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.

21st CENTURY LIFE AND CAREER READY PRACTICES

 CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 8.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● Proportional reasoning and percents can be used to model and understand relationships which exist throughout numerous aspects of the world. ●	● How do percents help me as a consumer? ● How do ratios and proportions help as make understanding of percentages?

UNIT LEARNING TARGETS (Students will know how to…)

● Use proportional relationships to solve multi-step ratio and percent problems

- Solve problems involving tax, tip, markup, markdown, percent increase/decrease, percent error and simple interest
-

LEARNING ACTIVITIES: (Students will be able to…)

- Students will reason abstractly and quantitatively by relating proportions and percents to real-world situations comparing quantities.
- Students will use appropriate tools to solve percent problems, including proportions, equations, unit rates and calculators.
- Students will attend to precision paying attention to the appropriate answers given the context of the problem and assess their answers for reasonableness.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
- Percent Of a Number - Percent Markups, tax, tip - Percent markdown - Percent Increase/decrease, error, simple interest	District Summative Assessment: Math 7- Unit 8	- IXL - Student Presentation - Teacher Observation - Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 9:	Unit 9 Triangles and Angles		

UNIT SUMMARY

In this unit students review basic geometric terms that exist in the two dimensional plane. They will identify shapes and angles based on properties, names, points, lines, and shapes in the 2d plane. Students will then investigate triangles and their properties and draw freehand based on given characteristics paying particular attention to conditions that form a triangle. Students will create equations based on angle facts to solve for problems within geometric shapes.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.G.A.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.B.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.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 9.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Students will understand that: ● Shapes exist in two dimensional form and are classified based on characteristics. ● Specific conditions are needed to form triangles and triangles have specific characteristics.	● How do we represent points, lines and shapes in the coordinate plane? ● What conditions are needed to form a triangle? ● How do we describe triangles?

We can use equations and angle characteristics to solve for missing values.	How can angle relationships be used to write equations?
	How can we construct accurate drawings of triangles and angle relationships?

UNIT LEARNING TARGETS (Students will know how to…)

- Know how to name a point, line, ray, plane.
- Know basic geometric terms and symbols
- Identify types of triangles based on characteristics
- Explore conditions needed for triangles to exist
- Understand angle relationships and related vocabulary
- Use angle relationships to solve for missing values

LEARNING ACTIVITIES: (Students will be able to…)

- Students will construct viable arguments and critique the reasoning in regards to classifications of geometric terms and conditions of triangles.
- Use the appropriate tools to draw triangles other geometric shapes. Use equations, drawings, and manipulatives to create angle relationships and solve for missing values.
- Students will use clear vocabulary and definitions when speaking about and describing geometry terms.
- Students will give precise answers appropriate to the problem context, for examples, assess their solutions to angle relationship equations as logical or illogical.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
- Geometric Terms and Classification - Types of Triangles and Conditions - Angle facts and relationships	District Summative Assessment-Math 7-Unit 9	- IXL - Student Presentation - Teacher Observation - Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

[Sparta Twp. Public Schools Differentiation Strategies](#)

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 10:	Unit 10-Area, Perimeter, and Circumference		

UNIT SUMMARY

In this unit, students will investigate the area and perimeter of 2D figures. They will explore formulas and apply them to compound figures and 2D figures in real world situations. Students will extend their understanding of area and perimeter to the area and circumference of circles and apply these formulas to real world problems.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.G.B.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.B.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.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 10.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
● Area is additive, meaning the area of a figure is the same as the sum of the area of non-overlapping regions of the figure. ● It is possible to find the area of a figure by creating a new region of known or equal area. ● We can find unknown measurements if we know sufficient information about the figure.	● What is the universal way to calculate the perimeter of all 2D figures? ● How are perimeter and area different in the coordinate plane and units of measure? ● How are the parts of a circle related? ● How can the circumference and area of a circle be calculated?

● Formulas can be used to find circumference and area of circles.	

UNIT LEARNING TARGETS (Students will know how to…)

- Know how to find the perimeter of 2D figures
- Know and use formulas for finding the area of 2D figures
- Know the formulas for area and circumference of a circle
- Informally derive the relationship between circumference and area of a circle
- Use the formulas for area and circumference of a circle to solve problems

LEARNING ACTIVITIES: (Students will be able to…)

- Students will attend to precision when calculating area of figures.
- Students will look for and make use of the structure of polygons and the formulas for their areas when calculating the area of composite shapes.
- Students will reason abstractly by decomposing compound figures into simpler polygons and quantitatively by representing the area of each decomposed shape with numeric expressions to find the total area of the compound figure.
- Students will attend to precision when calculating the area and circumference of circles. Students will recognize that there is a difference in the degree of precision used when pi is rounded versus when it is not rounded.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Perimeter of 2D Shapes ● Area of 2D Shapes ● Circumference and area of Circles ● Problem solving with area, perimeter, and circumference formulas ● Area and perimeter of compound shapes	District Summative Assessment-Math 7: Unit 10- Area, Perimeter and Circumference	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics	Interactive Whiteboard

Youtube EngageNY	Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY
DIFFERENTIATION:	
[Sparta Twp. Public Schools Differentiation Strategies](#)	
TEACHER NOTES:	

CONTENT AREA:	Math	GRADE LEVEL:	7
UNIT 11:	Unit 11- SA, Volume, Cross Sections		

UNIT SUMMARY

Students will first investigate the characteristics of three dimensional figures and the differences between 3D and 2D. They will then apply these characteristics to surface area, volume, and cross sections. Students will use previously learned understanding of area to extend to surface area of 3D figures. Students will then investigate the difference between area and volume, learning the formulas for volume of 3D figures and using them to solve real world problems. Students will then explore resulting figures when slicing three dimensional figures in a 3D plane.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.G.A.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.B.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.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 11.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● Surface area is two dimensional while volume is three dimensional. ● Three dimensional shapes can be sliced to form two dimensional shapes.	● How can we use the area of known shapes to calculate the surface area of three dimensional figures? ● How are three dimensional shapes different than two dimensional?

	● How can we form two dimensional shapes from theoretically slicing three dimensional shapes?

UNIT LEARNING TARGETS (Students will know how to…)

- Calculate the surface area of composite figures using previously known area formulas of geometric shapes
- Understand the difference between area and volume and how they are represented in the coordinate plane (2D/3D)
- Calculate the volume of three dimensional figures
- Identify specific ways a three dimensional figure can be sliced to result in a certain two dimensional figure

LEARNING ACTIVITIES: (Students will be able to…)

- Make sense of given problems and persevere in multiple step area and volume tasks
- Use models to represent 2D and 3D figures to calculate Surface area and volume
- Use appropriate tools to construct virtual and physical representations of three dimensional figures to show resulting cross sections
- Students will attend to precision when determining the appropriate units for surface area and volume

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Area and Surface Area ● 3D Figures and Volume ● Cross Sections	District Summative Assessment-Math 7: Unit 11	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies
TEACHER NOTES:

CONTENT AREA:	Math	GRADE LEVEL:	7
UNIT 12:	Unit 12 Statistics- Measures of Central Tendency and Data Displays		

UNIT SUMMARY

Students will use previously learned knowledge of finding measures of center and variation, like mean, median, mode, range and mean absolute deviation to make inferences about two populations Students will use data to informally assess the degree of visual overlap of two numerical data distributions.

NEW JERSEY STUDENT LEARNING STANDARDS

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.
7.SP.4
Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 12.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Students will understand that: ● Two populations can be compared by visually assessing their data sets.	● How can we represent data from population samples to allow for visual assessment?

● We can make informal comparative inferences about populations by examining visual representations of measures of center and variability.	● What representation is best used for the type of data collected? ● Can we look for repetition and patterns in data distributions to make inferences? ● What does it mean when there is a visual overlap between data sets?

UNIT LEARNING TARGETS (Students will know how to…)

● Model abstractly to make generalizations about a population.
● Identify visual overlaps of a data set.
● Make informal arguments about populations and compare data.
● Use appropriate tools to model data displays.

LEARNING ACTIVITIES: (Students will be able to…)

● Students will model abstractly and quantitatively by relating statistical measures to make generalizations about a population.
● Students will use repeated reasoning to identify visual overlaps of a data sets.

● Students will make informal arguments about populations and compare and critique reasoning of others.
● Students will use appropriate tools to model data displays

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Data Displays ● Comparing Populations from data displays ● Making inferences from data displays and measures of center	District Summative Assessment-Math 7: Unit 12	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:
[Sparta Twp. Public Schools Differentiation Strategies](#)
TEACHER NOTES:

CONTENT AREA:	Math	GRADE LEVEL:	7
UNIT 13:	Unit 13- Sampling		

UNIT SUMMARY

In this unit students will use prior knowledge of data collection and distributions to analyze populations and samples. Students will look at valid and invalid inferences based on specific types of sampling. Students will use data to make inferences about population samples and create displays that represent their data.

NEW JERSEY STUDENT LEARNING STANDARDS

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.

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.

7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

21st CENTURY LIFE AND CAREER READY PRACTICES

 CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 13.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.R5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● Representative samples can be used to examine larger populations ● Measures of center and variability of representative samples can be used to describe populations ● Data collected from representative samples of populations can be used to make inferences about two populations	● How can we gain understanding about a large population by looking at a smaller portion? ● What types of samples are representative of a population? ● How can we use collected data to make predictions about similar samples? ● How can measures of center and variability help us understand a sample population?

UNIT LEARNING TARGETS (Students will know how to…)

● Identify different types of population samples
● Use representative samples to represent populations
● Make predictions about a population from collected data from a sample
● USe data distributions and measures of variability to compare two populations

LEARNING ACTIVITIES: (Students will be able to…)

● Students will model abstractly and quantitatively by relating statistical measures to make generalizations about a population.
● Students will use appropriate tools like data displays to make inferences about populations
● Students will attend to precision when calculating measures of center and variability
● Students will look for structure and repeated reasoning in data drawn from population samples to make predictions and comparisons

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Types of Population Samples ● Predictions from population Samples ● Making inferences from data distributions to compare two populations	District Summative Assessment-Math 7 Unit 13	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics

EngageNY	Youtube EngageNY
DIFFERENTIATION:	
[Sparta Twp. Public Schools Differentiation Strategies](#)	
TEACHER NOTES:	