Math 8 Curricular Framework

UNIT 1 FOCUS	
Real Numbers *Pacing: 3 weeks*	
STANDARDS FOR MATHEMATICAL CONTENT	**STANDARDS FOR MATHEMATICAL PRACTICE**
8.EE.A Work with radicals and integer exponents 8.NS.A Know that there are numbers that are not rational, and approximate them by rational numbers.	MP.2 Reason abstractly and quantitatively MP.7 Look for and make use of structure
INTERDISCIPLINARY CONNECTIONS	**UNIT 1 GENERAL ASSESSMENTS**
Interdisciplinary connections may include but are not limited to: STEM Project: “Going, Going, Gone?” Next Generation Science Standards: MS-PS1-3, MS-ESS3-1, MS-ESS3-4, MS-ETS1-1 **21st Century Standards** 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career. 9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions. **21st Century Skills: Career Ready Practice Standards:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP6. Demonstrate creativity and innovation.	Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Topic Assessment Topic Performance Task

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CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. *Additional interdisciplinary connections to be determined during Curriculum Development Periods*	
RESOURCES	**TECHNOLOGY INTEGRATION**
Lesson Resources Student Edition Additional Practice Workbook Teaching Resources ● Reteach to Build Understanding ● Additional Vocabulary Support ● Build Mathematical Literacy ● Enrichment	Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples 3-Act Mathematical Modeling: "Hard-Working Organs" STEM Project: "Going, Going, Gone?" Online Practice powered by MathXL Virtual Nerd Video Tutorials Animated Glossary Digital Math Tools Online Math Games **STANDARDS** 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. 8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. 8.1.8.D.2 Demonstrate the application of appropriate citations to digital content. 8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property. 8.1.8.D.4 Assess the credibility and accuracy of digital content.

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	8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse. 8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. Link: NJDOE Technology Standards *Additional technology connections to be determined during Curriculum Development Periods.*

KEY VOCABULARY
cube root, irrational number, Negative Exponent Property, perfect cube, perfect square, Power of Powers Property, Power of Products Property, Product of Powers Property, Quotient of Powers Property, scientific notation, square root, Zero Exponent Property

GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS		
English Language Learners	**Students Receiving Special Education Services**	**Advanced Learners**
• WIDA Can Do Descriptors for Grades 6-8* • WIDA Essential Actions Handbook • FABRIC Paradigm • Wall Township ESL Grading Protocol *Use WIDA Can Do Descriptors in coordination with Student Language Portraits (SLPs). **Potential Accommodations for ELLs** • Personal glossary	• New Jersey Tiered System of Supports • National Center on Universal Design for Learning - About UDL • UDL Checklist • UDL Key Terms Response to Intervention: Reteach to Build Understanding, Additional Vocabulary Support, Build Mathematical Literacy Students within this class receiving Special Education/Section 504 programming have specific goals and objectives, as well as accommodations and	• Knowledge and Skill Standards in Gifted Education for All Teachers • Pre-K-Grade 12 Gifted Programming Standards • Gifted Programming Glossary of Terms **Potential Accommodations for Advanced Learners** • Use of high level academic vocabulary/texts • Problem-based learning

- Text-to-speech
- Extended time
- Simplified / verbal instructions
- Frequent breaks
- Small group/One to one
- Additional time
- Review of directions
- Student restates information
- Extra visual and verbal cues and prompts
- Preferential seating
- Verbal and visual cues regarding directions and staying on task
- Checklists
- Immediate feedback

modifications outlined within their Individualized Education Plans (IEP)/504 Plans due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner.

Potential Accommodations for Special Education

Presentation accommodations:

- Listen to audio recordings instead of reading text
- Pre-teach unknown vocabulary through pictures or videos, and relate to prior knowledge
- Work with fewer items per page and/or materials in a larger print size
- Use a visual blocker
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of instructions/picture cues

Response accommodations:

- Give responses in a form (oral or written) that's easier for him/her
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use a spelling dictionary or electronic spell-checker
- Use a word processor to give responses in class
- Use a calculator or table of "math facts"

Setting accommodations:

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where he/she learns best (for example, near the teacher)

- Pre-assess to condense curriculum
- Interest-based research
- Authentic problem-solving
- Homogeneous grouping opportunities

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.

	● Take a test in small group setting **Timing accommodations**: ● Take more time to complete a task or a test ● Have extra time to process oral information and directions ● Take frequent breaks, such as after completing a task **Assignment modifications**: ● Complete fewer or different homework problems than peers ● Shorten assignment ● Answer fewer or different test questions ● Create alternate projects or assignments	

At Risk Learners / Differentiation Strategies		
Alternative Assessments Choice Boards Games and Tournaments Group Investigations Guided Reading Learning Contracts Leveled Rubrics Literature Circles Multiple Texts Personal Agendas	Independent Research & Projects Multiple Intelligence Options Project-Based Learning Varied Supplemental Activities Varied Journal Prompts or RAFT Writing Tiered Activities/Assignments Tiered Products Graphic Organizers Choice of Books/Activities Mini-Workshops to Reteach or Extend Think-Pair-Share by readiness or interest Use of Collaboration of Various Activities	Jigsaw Think-Tac-Toe Cubing Activities Exploration by Interest Flexible Grouping Goal-Setting with Students Homework Options Open-Ended Activities Use of Reading Buddies Varied Product Choices Stations/Centers Work Alone/Together

CONTENT STANDARD	SUGGESTED MATHEMATICAL PRACTICES	CRITICAL KNOWLEDGE & SKILLS

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8.NS.A.1 8.NS.A.2 8.EE.A.1 8.EE.A.2 8.EE.A.3 8.EE.A.4	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8	<u>Concepts:</u> ● Rational Numbers as Decimals ● Understand Irrational Numbers ● Compare and Order Real Numbers ● Evaluate Square Roots and Cube Roots ● Solve Equations Using Square Roots and Cube Roots ● Use Properties of Integer Exponents ● Use Powers of 10 to Estimate Quantities ● Understand Scientific Notation ● Mathematical Modeling ● Operations with Numbers in Scientific Notation <u>Students are able to:</u> ● Locate repeating decimals on a number line. ● Write repeating decimals as fractions. ● Classify a number as rational or irrational. ● Understand the concepts of square roots and cube roots. ● Approximate square roots by using perfect squares. ● Compare and order rational and irrational numbers. ● Evaluate square roots and cube roots to solve problems. ● Evalue perfect squares and perfect cubes. ● Solve equations involving perfect squares or cubes. ● Solve equations involving imperfect squares or cubes. ● Multiply and divide expressions with integer exponents. ● Find the power of a power. ● Simplify exponential expressions using the Zero Exponent Property and the Negative Exponent Property. ● Estimate and compare very large and very small quantities using powers of 10. ● Write very large and very small numbers in scientific notation. ● Convert scientific notation to standard form. ● Use mathematical modeling to represent a problem situation and to propose a solution. ● Test and verify the appropriateness of math models.

		● Add, subtract, multiply, and divide numbers in scientific notation. <u>Learning Goal:</u> ● Repeating decimals can be represented as an equivalent rational number. ● Every real number is either a rational number or an irrational number. ● Rational and irrational numbers can be compared and ordered using decimal approximations. ● To find the square root of a number, find the factor whose square is equal to that number. To find a cube root, find the factor whose cube is equal to that number. ● Solve equations with squares by taking the square root of each side of the equation. Solve equations with cubes by taking the cube root of each side of the equation. ● The properties of exponents are used to simplify expressions by adding, subtracting, multiplying, or dividing either the base or the exponents. ● Any nonzero number raised to the power of zero is equal to 1. Any nonzero number raised to a negative power is equal to its multiplicative reciprocal. ● An estimate of very small or very large quantity can be written as a single digit times a power of ten. ● Scientific notation is an efficient way to write very small or very large numbers. ● Many real-world problem situations can be represented with a mathematical model, but that model may not represent a real-world situation exactly. ● Operating with numbers in scientific notation is an efficient way to add, subtract, multiply, and divide very large or very small numbers.

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UNIT 2 FOCUS	
Analyze and Solve Linear Equations *Pacing: 5 weeks*	
STANDARDS FOR MATHEMATICAL CONTENT	**STANDARDS FOR MATHEMATICAL PRACTICE**
8.EE.B Understand the connections between proportional relationships, lines, and linear equations. 8.EE.C Analyze and solve linear equations and pairs of simultaneous linear equations.	MP.4 Model with mathematics. MP.7 Look for and make use of structure.
INTERDISCIPLINARY CONNECTIONS	**UNIT 2 GENERAL ASSESSMENTS**
Interdisciplinary connections may include but are not limited to: STEM Project "Modeling Population Growth" Next Generation Science Standards: MS-LS201, MS-LS2-4, MS-ESS3-4 **21st Century Standards** **9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.** **9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.** **21st Century Skills: Career Ready Practice Standards:** **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.	Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Topic Assessment Topic Performance Task

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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. *Additional interdisciplinary connections to be determined during Curriculum Development Periods*	
RESOURCES	**TECHNOLOGY INTEGRATION**
Lesson Resources Student Edition Additional Practice Workbook Teaching Resources ● Reteach to Build Understanding ● Additional Vocabulary Support ● Build Mathematical Literacy ● Enrichment	Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples 3-Act Mathematical Modeling: "Powering Down" STEM Project: "Modeling Population Growth" Online Practice powered by MathXL Virtual Nerd Video Tutorials Animated Glossary Digital Math Tools Online Math Games **STANDARDS**

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	8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. **8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.** **8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.** **8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property.** **8.1.8.D.4 Assess the credibility and accuracy of digital content.** **8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse.** **8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.** Link: NJDOE Technology Standards *Additional technology connections to be determined during Curriculum Development Periods.*

KEY VOCABULARY
slope of a line, slope-intercept form, *y*-intercept

GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS		
English Language Learners	**Students Receiving Special Education Services**	**Advanced Learners**
• WIDA Can Do Descriptors for Grades 6-8* • WIDA Essential Actions Handbook • FABRIC Paradigm • Wall Township ESL Grading Protocol *Use WIDA Can Do Descriptors in coordination	• New Jersey Tiered System of Supports • National Center on Universal Design for Learning - About UDL • UDL Checklist • UDL Key Terms	• Knowledge and Skill Standards in Gifted Education for All Teachers • Pre-K-Grade 12 Gifted Programming Standards • Gifted Programming Glossary of Terms

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with Student Language Portraits (SLPs).

Potential Accommodations for ELLs

- Personal glossary
- Text-to-speech
- Extended time
- Simplified / verbal instructions
- Frequent breaks
- Small group/One to one
- Additional time
- Review of directions
- Student restates information
- Extra visual and verbal cues and prompts
- Preferential seating
- Verbal and visual cues regarding directions and staying on task
- Checklists
- Immediate feedback

Response to Intervention:
Reteach to Build Understanding, Additional Vocabulary Support, Build Mathematical Literacy

Students within this class receiving Special Education/Section 504 programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP)/504 Plans due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner.

Potential Accommodations for Special Education

Presentation accommodations:

- Listen to audio recordings instead of reading text
- Pre-teach unknown vocabulary through pictures or videos, and relate to prior knowledge
- Work with fewer items per page and/or materials in a larger print size
- Use a visual blocker
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of

Potential Accommodations for Advanced Learners

- Use of high level academic vocabulary/texts
- Problem-based learning
- Pre-assess to condense curriculum
- Interest-based research
- Authentic problem-solving
- Homogeneous grouping opportunities

	instructions/picture cues **Response accommodations**: ● Give responses in a form (oral or written) that's easier for him/her ● Dictate answers to a scribe ● Capture responses on an audio recorder ● Use a spelling dictionary or electronic spell-checker ● Use a word processor to give responses in class ● Use a calculator or table of "math facts" **Setting accommodations**: ● Work or take a test in a different setting, such as a quiet room with few distractions ● Sit where he/she learns best (for example, near the teacher) ● Take a test in small group setting **Timing accommodations**: ● Take more time to complete a task or a test ● Have extra time to process oral information and directions ● Take frequent breaks, such as after completing a task **Assignment modifications**: ● Complete fewer or different homework problems than peers ● Shorten assignment ● Answer fewer or different test questions ● Create alternate projects or assignments	
		Students with 504 Plans

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		Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.

At Risk Learners / Differentiation Strategies		
Alternative Assessments	Independent Research & Projects	Jigsaw
Choice Boards	Multiple Intelligence Options	Think-Tac-Toe
Games and Tournaments	Project-Based Learning	Cubing Activities
Group Investigations	Varied Supplemental Activities	Exploration by Interest
Guided Reading	Varied Journal Prompts or RAFT Writing	Flexible Grouping
Learning Contracts	Tiered Activities/Assignments	Goal-Setting with Students
Leveled Rubrics	Tiered Products	Homework Options
Literature Circles	Graphic Organizers	Open-Ended Activities
Multiple Texts	Choice of Books/Activities	Use of Reading Buddies
Personal Agendas	Mini-Workshops to Reteach or Extend	Varied Product Choices
	Think-Pair-Share by readiness or interest	Stations/Centers
	Use of Collaboration of Various Activities	Work Alone/Together

CONTENT STANDARD	SUGGESTED MATHEMATICAL PRACTICES	CRITICAL KNOWLEDGE & SKILLS
8.EE.B.5 8.EE.B.6 8.EE.C.7a 8.EE.C.7b	MP.1 MP.2 MP.3 MP.4 MP.6 MP.7 MP.8	Concepts: ● Combine Like Terms to Solve Equations ● Solve Equations with Variables on Both Sides ● Solve Multistep Equations ● Equations with No Solutions or Infinitely Many Solutions ● Mathematical Modeling ● Compare Proportional Relationships

		● Connect Proportional Relationships and Slope ● Analyze Linear Equations: $y = mx$ ● Understand the y-intercept of a Line ● Analyze Linear Equations: $y = mx + b$ Students are able to: ● Combine like terms. ● Solve equations with like terms on one side of the equation. ● Make sense of scenarios and represent them with equations. Solve equations with like terms on both sides of the equation. ● Make sense of scenarios and represent them with equations. ● Plan multiple solution pathways and choose one to find the solution. ● Determine the number of solutions to an equation. ● Use mathematical modeling to represent a problem situation and to propose a solution. ● Test and verify the appropriateness of math models. ● Analyze equations, linear graphs, and tables to find unit rates and compare proportional relationships. ● Find the slope of a line using different strategies. ● Interpret a slope in context and relate it to steepness on a graph. ● Understand how the constant of proportionality and the slope relate in a linear equation. ● Write a linear equation in the form $y = mx$ when the slope is given. ● Graph a linear equation in the form $y = mx$. ● Interpret and extend the table or graph of a linear relationship to find its y-intercept. ● Graph a line from an equation in the form $y = mx + b$.

		• Write an equation that represents the given graph of a line. Learning Goal: • Combining like terms that are on one side of an equation makes it easier to solve for the variable by using inverse operations. • To solve a linear equation that has variable terms on both sides of the equation, first use inverse operations to move all variable terms to one side of the equation and constant terms to the other. Then, isolate the variable. • The Distributive Property is an important tool for simplifying expressions and combining like terms. • Equations with one variable can have zero, one, or infinitely many solutions. • Many real-world problem situations can be represented with a mathematical model, but that model may not represent a real-world situation exactly. • Proportional relationships can be represented using different models, including graphs, tables, and equations. • Slope is a measure of the steepness of a line is equal to the rate of change between quantities. In a proportional relationship, slope is the same as the unit rate and the constant of proportionality. • The slope, constant of proportionality, and unit rate are equal for proportional relationships. • The *y*-intercept of a line is the *y*-coordinate of the point where the graph of the line crosses the *y*-axis. Its meaning depends on the context of the graph. • The slope-intercept form for a linear equation, $y = mx + b$, gives information to sketch a graph of the line. It indicates that the point (0, *b*) is on the graph of the line

		and shows that the slope of the line is *m*.

UNIT 3 FOCUS	
Use Functions to Model Relationships *Pacing: 4 weeks*	
STANDARDS FOR MATHEMATICAL CONTENT	**STANDARDS FOR MATHEMATICAL PRACTICE**
8.F.A Define, evaluate, and compare functions. 8.F.B Use functions to model relationships between quantities.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics.

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INTERDISCIPLINARY CONNECTIONS	UNIT 3 GENERAL ASSESSMENTS
Interdisciplinary connections may include but are not limited to: STEM Project "Modeling Population Growth" Next Generation Science Standards: MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4 **21st Century Standards** **9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.** **9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.** **21st Century Skills: Career Ready Practice Standards:** **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.	Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Topic Assessment Topic Performance Task

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Additional interdisciplinary connections to be determined during Curriculum Development Periods	
RESOURCES	**TECHNOLOGY INTEGRATION**
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	Link: NJDOE Technology Standards *Additional technology connections to be determined during Curriculum Development Periods.*

KEY VOCABULARY

constant rate of change, function, initial value, interval, linear function, nonlinear function, qualitative graph, relation

GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS

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prompts ● Preferential seating ● Verbal and visual cues regarding directions and staying on task ● Checklists ● Immediate feedback	The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner. **Potential Accommodations for Special Education** **Presentation accommodations**: ● Listen to audio recordings instead of reading text ● Pre-teach unknown vocabulary through pictures or videos, and relate to prior knowledge ● Work with fewer items per page and/or materials in a larger print size ● Use a visual blocker ● Use visual presentations of verbal material, such as word webs and visual organizers ● Be given a written list of instructions/picture cues **Response accommodations**: ● Give responses in a form (oral or written) that's easier for him/her ● Dictate answers to a scribe ● Capture responses on an audio recorder ● Use a spelling dictionary or electronic spell-checker ● Use a word processor to give responses in class ● Use a calculator or table of "math facts" **Setting accommodations**: ● Work or take a test in a different setting, such as a quiet room with few distractions	

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	● Sit where he/she learns best (for example, near the teacher) ● Take a test in small group setting **Timing accommodations**: ● Take more time to complete a task or a test ● Have extra time to process oral information and directions ● Take frequent breaks, such as after completing a task **Assignment modifications**: ● Complete fewer or different homework problems than peers ● Shorten assignment ● Answer fewer or different test questions ● Create alternate projects or assignments	
		Students with 504 Plans
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At Risk Learners / Differentiation Strategies		
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Group Investigations	Varied Supplemental Activities	Exploration by Interest
Guided Reading	Varied Journal Prompts or RAFT Writing	Flexible Grouping
Learning Contracts	Tiered Activities/Assignments	Goal-Setting with Students

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Leveled Rubrics Literature Circles Multiple Texts Personal Agendas	Tiered Products Graphic Organizers Choice of Books/Activities Mini-Workshops to Reteach or Extend Think-Pair-Share by readiness or interest Use of Collaboration of Various Activities	Homework Options Open-Ended Activities Use of Reading Buddies Varied Product Choices Stations/Centers Work Alone/Together

CONTENT STANDARD	SUGGESTED MATHEMATICAL PRACTICES	CRITICAL KNOWLEDGE & SKILLS
8.F.A.1 8.F.A.2 8.F.A.3 8.F.B.4 8.F.B.5	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8	Concepts: ● Understand Relations and Functions ● Connect Representations of Functions ● Compare Linear and Nonlinear Functions ● Mathematical Modeling ● Construct Functions to Model Linear Relationships ● Intervals of Increase and Decrease ● Sketch Functions from Verbal Descriptions Students are able to: ● Identify whether a relation is a function. ● Interpret a function. ● Identify functions in different representations: equations, tables, and graphs. ● Identify linear and nonlinear functions in different representations. ● Compare properties of linear functions in different representations. ● Compare properties of linear functions in different representations. ● Compare properties of linear and nonlinear functions in

		different representations. ● Use mathematical modeling to represent a problem situation and to propose a solution. ● Test and verify the appropriateness of math models. ● Explain why the results from their mathematical models may not align exactly to the problem situation. ● Construct a linear function to model a relationship using an equation in the form y = mx + b. ● Describe quantitatively the behavior of a function by analyzing its graph. ● Describe the graph of a function at each interval. ● Draw a qualitative graph of a function based on a verbal description. ● Analyze and interpret the sketch of a graph of a function. Learning Goal: ● A relation is a set of ordered pairs. A function is a relation in which each input, or x-value, has exactly one output, or y-value. Arrow diagrams and tables can be used to determine whether a relation is a function. ● Different representations, such as equations, tables, and graphs, can represent a function. The graph of a linear function is a straight line; the graph of a nonlinear function is not a straight line. ● Two functions presented in different representations can be compared by looking at their properties: initial value and constant rate of change. ● Many real-world problem situations can be represented with a mathematical model, but that model may not represent a real-world situation exactly. ● A function that represents a linear relationship between two quantities can be represented by an equation written in the form y = mx + b.

		• The relationship between two quantities can be represented in a qualitative graph that shows the behavior of the function in different intervals. • You can use what you know about the behavior of a function in different intervals to sketch a qualitative graph of a function.

UNIT 4 FOCUS	
Investigate Bivariate Data *Pacing: 3 weeks*	
STANDARDS FOR MATHEMATICAL CONTENT	**STANDARDS FOR MATHEMATICAL PRACTICE**
8.SP.A Investigate patterns of association in bivariate data.	MP.1 Make sense of problems and persevere in solving them. MP.7 Look for and make use of structure.
INTERDISCIPLINARY CONNECTIONS	**UNIT 4 GENERAL ASSESSMENTS**
Interdisciplinary connections may include but are not limited to: STEM Project “How Many Fish?” Next Generation Science Standards: MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4 **21st Century Standards**	Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Topic Assessment Topic Performance Task

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9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career. **9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.** **21st Century Skills: Career Ready Practice Standards:** **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. *Additional interdisciplinary connections to be determined during Curriculum Development Periods*	
RESOURCES	**TECHNOLOGY INTEGRATION**
Lesson Resources Student Edition Additional Practice Workbook	Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples

Math 8 Curricular Framework

Teaching Resources ● Reteach to Build Understanding ● Additional Vocabulary Support ● Build Mathematical Literacy ● Enrichment	3-Act Mathematical Modeling: “Reach Out” STEM Project: “How Many Fish?” Online Practice powered by MathXL Virtual Nerd Video Tutorials Animated Glossary Digital Math Tools Online Math Games **STANDARDS** **8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.** **8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.** **8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.** **8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property.** **8.1.8.D.4 Assess the credibility and accuracy of digital content.** **8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse.** **8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.** Link: NJDOE Technology Standards *Additional technology connections to be determined during Curriculum Development Periods.*
KEY VOCABULARY	
categorical data, cluster, gap, measurement data, negative association, outlier, positive association, relative frequency table, scatter plot, trend line	

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GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS		
English Language Learners	**Students Receiving Special Education Services**	**Advanced Learners**
• WIDA Can Do Descriptors for Grades 6-8* • WIDA Essential Actions Handbook • FABRIC Paradigm • Wall Township ESL Grading Protocol *Use WIDA Can Do Descriptors in coordination with Student Language Portraits (SLPs). **Potential Accommodations for ELLs** • Personal glossary • Text-to-speech • Extended time • Simplified / verbal instructions • Frequent breaks • Small group/One to one • Additional time • Review of directions • Student restates information • Extra visual and verbal cues and prompts • Preferential seating • Verbal and visual cues regarding directions and staying on task • Checklists • Immediate feedback	• New Jersey Tiered System of Supports • National Center on Universal Design for Learning - About UDL • UDL Checklist • UDL Key Terms Response to Intervention: Reteach to Build Understanding, Additional Vocabulary Support, Build Mathematical Literacy Students within this class receiving Special Education/Section 504 programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP)/504 Plans due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner. **Potential Accommodations for Special Education** **Presentation accommodations**: • Listen to audio recordings instead of reading text	• Knowledge and Skill Standards in Gifted Education for All Teachers • Pre-K-Grade 12 Gifted Programming Standards • Gifted Programming Glossary of Terms **Potential Accommodations for Advanced Learners** • Use of high level academic vocabulary/texts • Problem-based learning • Pre-assess to condense curriculum • Interest-based research • Authentic problem-solving • Homogeneous grouping opportunities

	● Pre-teach unknown vocabulary through pictures or videos, and relate to prior knowledge ● Work with fewer items per page and/or materials in a larger print size ● Use a visual blocker ● Use visual presentations of verbal material, such as word webs and visual organizers ● Be given a written list of instructions/picture cues **Response accommodations**: ● Give responses in a form (oral or written) that's easier for him/her ● Dictate answers to a scribe ● Capture responses on an audio recorder ● Use a spelling dictionary or electronic spell-checker ● Use a word processor to give responses in class ● Use a calculator or table of "math facts" **Setting accommodations**: ● Work or take a test in a different setting, such as a quiet room with few distractions ● Sit where he/she learns best (for example, near the teacher) ● Take a test in small group setting **Timing accommodations**: ● Take more time to complete a task or a test ● Have extra time to process oral information and directions ● Take frequent breaks, such as after completing a task	

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	Assignment modifications: ● Complete fewer or different homework problems than peers ● Shorten assignment ● Answer fewer or different test questions ● Create alternate projects or assignments	
		Students with 504 Plans
		Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.

At Risk Learners / Differentiation Strategies		
Alternative Assessments	Independent Research & Projects	Jigsaw
Choice Boards	Multiple Intelligence Options	Think-Tac-Toe
Games and Tournaments	Project-Based Learning	Cubing Activities
Group Investigations	Varied Supplemental Activities	Exploration by Interest
Guided Reading	Varied Journal Prompts or RAFT Writing	Flexible Grouping
Learning Contracts	Tiered Activities/Assignments	Goal-Setting with Students
Leveled Rubrics	Tiered Products	Homework Options
Literature Circles	Graphic Organizers	Open-Ended Activities
Multiple Texts	Choice of Books/Activities	Use of Reading Buddies
Personal Agendas	Mini-Workshops to Reteach or Extend	Varied Product Choices
	Think-Pair-Share by readiness or interest	Stations/Centers
	Use of Collaboration of Various Activities	Work Alone/Together

Math 8 Curricular Framework

CONTENT STANDARD	SUGGESTED MATHEMATICAL PRACTICES	CRITICAL KNOWLEDGE & SKILLS
8.SP.A.1 **8.SP.A.2** **8.SP.A.3** **8.SP.A.4** **8.F.A.3** **8.F.B.4**	MP.1 MP.2 MP.3 MP.4 MP.7 MP.8	Concept(s): ● Construct and Interpret Scatter Plots ● Analyze Linear Associations ● Use Linear Models to Make Predictions ● Interpret Two-Way Frequency Tables ● Interpret Two-Way Relative Frequency Tables ● Mathematical Modeling Students are able to: ● Construct a scatter plot to model paired data. ● Utilize a scatter plot to identify and interpret the relationship between paired data. ● Recognize whether the paired data has a linear association, a nonlinear association, or no association. ● Draw a trend line to determine whether a linear association is positive or negative and strong or weak. ● Use the slope and y-intercept of a trend line to make a prediction. ● Make a prediction when no equation is given by drawing trend lines and writing the equation of the linear model. ● Organize paired categorical data into a two-way frequency table. ● Compare and make conjectures about data displayed in a two-way frequency table. ● Construct two-way frequency tables and two-way relative frequency tables. ● Compare and make conjectures about data displayed in a two-way relative frequency table. ● Use mathematical modeling to represent a problem situation and to propose a solution.

		● Test and verify the appropriateness of math models. ● Explain why the results from mathematical models may not align exactly with the problem situation. Learning Goal: ● A scatter plot is a graph on a coordinate plane that uses points to show the relationship between paired data. These points visually display any clusters, gaps, or outliers. ● A trend line on a scatter plot approximates the linear association between the paired data. Scatter plots can show a linear or nonlinear association, or no association. ● Trend lines in linear models can help with making predictions about a set of data. By determining the equation of a linear model, predictions of an outcome can be made. ● Data can be displayed in a two-way frequency table, making it easier to analyze. Individual data categories can be compared to all the data. Individual data can also be compared to sub-categories to make evidence-based conjectures. ● Many real-world problem situations can be represented with a mathematical model, but that model may not represent a real-world situation exactly.

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UNIT 5 FOCUS	
Analyze and Solve Systems of Linear Equations *Pacing: 4 weeks*	
STANDARDS FOR MATHEMATICAL CONTENT	**STANDARDS FOR MATHEMATICAL PRACTICE**
8.EE.C Analyze and solve linear equations and pairs of simultaneous linear equations.	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.
INTERDISCIPLINARY CONNECTIONS	**UNIT 5 GENERAL ASSESSMENTS**
Interdisciplinary connections may include but are not limited to: STEM Project "Daily Grind" Next Generation Science Standards: MS-LS1-5, MS-LS2-1, MS-ESS3-3, MS-ESS3-4 **21st Century Standards** **9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.** **9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.** **21st Century Skills: Career Ready Practice Standards:** **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	Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Topic Assessment Topic Performance Task

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. *Additional interdisciplinary connections to be determined during Curriculum Development Periods*	
RESOURCES	**TECHNOLOGY INTEGRATION**
Lesson Resources Student Edition Additional Practice Workbook Teaching Resources ● Reteach to Build Understanding ● Additional Vocabulary Support ● Build Mathematical Literacy ● Enrichment	Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples 3-Act Mathematical Modeling: "Ups and Downs" STEM Project: "Daily Grind" Online Practice powered by MathXL Virtual Nerd Video Tutorials Animated Glossary Digital Math Tools Online Math Games **STANDARDS** **8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.**

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	8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. **8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.** **8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property.** **8.1.8.D.4 Assess the credibility and accuracy of digital content.** **8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse.** **8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.** Link: NJDOE Technology Standards *Additional technology connections to be determined during Curriculum Development Periods.*

KEY VOCABULARY
solution of a system of linear equations, system of linear equations

GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS		
English Language Learners	**Students Receiving Special Education Services**	**Advanced Learners**
• WIDA Can Do Descriptors for Grades 6-8* • WIDA Essential Actions Handbook • FABRIC Paradigm • Wall Township ESL Grading Protocol *Use WIDA Can Do Descriptors in coordination with Student Language Portraits (SLPs).	• New Jersey Tiered System of Supports • National Center on Universal Design for Learning - About UDL • UDL Checklist • UDL Key Terms Response to Intervention: Reteach to Build Understanding, Additional	• Knowledge and Skill Standards in Gifted Education for All Teachers • Pre-K-Grade 12 Gifted Programming Standards • Gifted Programming Glossary of Terms **Potential Accommodations for Advanced Learners**

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Potential Accommodations for ELLs ● Personal glossary ● Text-to-speech ● Extended time ● Simplified / verbal instructions ● Frequent breaks ● Small group/One to one ● Additional time ● Review of directions ● Student restates information ● Extra visual and verbal cues and prompts ● Preferential seating ● Verbal and visual cues regarding directions and staying on task ● Checklists ● Immediate feedback	Vocabulary Support, Build Mathematical Literacy Students within this class receiving Special Education/Section 504 programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP)/504 Plans due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner. **Potential Accommodations for Special Education** **Presentation accommodations**: ● Listen to audio recordings instead of reading text ● Pre-teach unknown vocabulary through pictures or videos, and relate to prior knowledge ● Work with fewer items per page and/or materials in a larger print size ● Use a visual blocker ● Use visual presentations of verbal material, such as word webs and visual organizers ● Be given a written list of instructions/picture cues **Response accommodations**:	● Use of high level academic vocabulary/texts ● Problem-based learning ● Pre-assess to condense curriculum ● Interest-based research ● Authentic problem-solving ● Homogeneous grouping opportunities

	● Give responses in a form (oral or written) that's easier for him/her ● Dictate answers to a scribe ● Capture responses on an audio recorder ● Use a spelling dictionary or electronic spell-checker ● Use a word processor to give responses in class ● Use a calculator or table of "math facts" **Setting accommodations**: ● Work or take a test in a different setting, such as a quiet room with few distractions ● Sit where he/she learns best (for example, near the teacher) ● Take a test in small group setting **Timing accommodations**: ● Take more time to complete a task or a test ● Have extra time to process oral information and directions ● Take frequent breaks, such as after completing a task **Assignment modifications**: ● Complete fewer or different homework problems than peers ● Shorten assignment ● Answer fewer or different test questions ● Create alternate projects or assignments	
		Students with 504 Plans
		Teachers are responsible for implementing

		designated services and strategies identified on a student's 504 Plan.

At Risk Learners / Differentiation Strategies		
Alternative Assessments	Independent Research & Projects	Jigsaw
Choice Boards	Multiple Intelligence Options	Think-Tac-Toe
Games and Tournaments	Project-Based Learning	Cubing Activities
Group Investigations	Varied Supplemental Activities	Exploration by Interest
Guided Reading	Varied Journal Prompts or RAFT Writing	Flexible Grouping
Learning Contracts	Tiered Activities/Assignments	Goal-Setting with Students
Leveled Rubrics	Tiered Products	Homework Options
Literature Circles	Graphic Organizers	Open-Ended Activities
Multiple Texts	Choice of Books/Activities	Use of Reading Buddies
Personal Agendas	Mini-Workshops to Reteach or Extend	Varied Product Choices
	Think-Pair-Share by readiness or interest	Stations/Centers
	Use of Collaboration of Various Activities	Work Alone/Together

CONTENT STANDARD	SUGGESTED MATHEMATICAL PRACTICES	CRITICAL KNOWLEDGE & SKILLS
8.EE.C.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously **8.EE.C.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the	MP.2 MP.3 MP.4 MP.6 MP.7 MP.8	Concept(s): ● Estimate Solutions by Inspection ● Solve Systems by Graphing ● Solve Systems by Substitution ● Solve Systems by Elimination ● Mathematical Modeling Students are able to: ● Examine graphs of linear systems of equations to

equations. Solve simple cases by inspection. **8.EE.C.8c** Solve real-world and mathematical problems leading to two linear equations in two variables. **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. **8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values		determine the number of solutions, based on the number of intersection points. ● Compare the equations in a linear system to look for a relationship between the number of solutions and the slopes and *y*-intercepts of the equations. ● Create and examine graphs of linear systems of equations to determine the solution. ● Understand how substitution can be used to solve a linear system of equations. ● Apply this understanding to solve a system of linear equations with one solution, no solutions, or infinitely many solutions. ● Understand how the process of elimination can be used to solve a system of linear equations with no solution, one solution, or infinitely many solutions. ● Apply this understanding to solve mathematical and real-world problems. ● Use mathematical modeling to represent a problem situation and to propose a solution. ● Test and verify the appropriateness of math models. ● Explain why the results from mathematical models may not align exactly to the problem situation. Learning Goal: ● A system of linear equations can have no solution, one solution, or infinitely many solutions. The number of solutions is based on the number of intersection points of the lines in the system. The number of solutions can be determined by comparing the slopes and *y*-intercepts of the equations. ● Systems of equations can have zero solutions, one solution, or infinitely many solutions. The solution to a linear system is the point or points at which the lines intersect.

		• Substitution is a useful method for solving a system of linear equations. It is accomplished by rewriting an equation for one variable in terms of the other, and substituting that expression into the other equation and then solving. • Elimination can be used to solve a system of linear equations by adding or subtracting the equations to eliminate one variable. The resulting equation can be solved for the remaining variable or used to determine if there is no solution or an infinite number of solutions. • Many real-world situations can be represented with a mathematical model, but that model may not represent a real-world situation exactly.

UNIT 6 FOCUS	
Congruence and Similarity *Pacing: 6 weeks*	
STANDARDS FOR MATHEMATICAL CONTENT	**STANDARDS FOR MATHEMATICAL PRACTICE**
8.G.A Understand congruence and similarity using physical models, transparencies, or geometry software.	MP. 2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others.

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INTERDISCIPLINARY CONNECTIONS	UNIT 6 GENERAL ASSESSMENTS
Interdisciplinary connections may include but are not limited to: STEM Project "Forest Health" Next Generation Science Standards: MS-LS2-1, MS-LS2-4, MS-ESS3-3, MS-ESS3-4 **21st Century Standards** **9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.** **9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.** **21st Century Skills: Career Ready Practice Standards:** **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.	Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Topic Assessment Topic Performance Task

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Additional interdisciplinary connections to be determined during Curriculum Development Periods	
RESOURCES	**TECHNOLOGY INTEGRATION**
Lesson Resources Student Edition Additional Practice Workbook Teaching Resources ● Reteach to Build Understanding ● Additional Vocabulary Support ● Build Mathematical Literacy ● Enrichment	Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples 3-Act Mathematical Modeling: "Tricks of the Trade" STEM Project: "Forest Health" Online Practice powered by MathXL Virtual Nerd Video Tutorials Animated Glossary Digital Math Tools Online Math Games **STANDARDS** **8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.** **8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.** **8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.** **8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property.** **8.1.8.D.4 Assess the credibility and accuracy of digital content.** **8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse.** **8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.**

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	Link: NJDOE Technology Standards *Additional technology connections to be determined during Curriculum Development Periods.*

KEY VOCABULARY
alternate interior angle, angle of rotation, center of rotation, congruent, corresponding angles, dilation, enlargement, exterior angle of a triangle, image, line of reflection, reduction, reflection, remote interior angles, rotation, same-side interior angles, scale factor, similar, transformation, translation, transversal

GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS		
English Language Learners	**Students Receiving Special Education Services**	**Advanced Learners**
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● Extra visual and verbal cues and prompts ● Preferential seating ● Verbal and visual cues regarding directions and staying on task ● Checklists ● Immediate feedback	differentiated based upon the student's needs. The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner. **Potential Accommodations for Special Education** **Presentation accommodations**: ● Listen to audio recordings instead of reading text ● Pre-teach unknown vocabulary through pictures or videos, and relate to prior knowledge ● Work with fewer items per page and/or materials in a larger print size ● Use a visual blocker ● Use visual presentations of verbal material, such as word webs and visual organizers ● Be given a written list of instructions/picture cues **Response accommodations**: ● Give responses in a form (oral or written) that's easier for him/her ● Dictate answers to a scribe ● Capture responses on an audio recorder ● Use a spelling dictionary or electronic spell-checker ● Use a word processor to give responses in class ● Use a calculator or table of "math facts" **Setting accommodations**: ● Work or take a test in a different setting,	

	such as a quiet room with few distractions ● Sit where he/she learns best (for example, near the teacher) ● Take a test in small group setting **Timing accommodations**: ● Take more time to complete a task or a test ● Have extra time to process oral information and directions ● Take frequent breaks, such as after completing a task **Assignment modifications**: ● Complete fewer or different homework problems than peers ● Shorten assignment ● Answer fewer or different test questions ● Create alternate projects or assignments	
		Students with 504 Plans
		Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.

At Risk Learners / Differentiation Strategies

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Alternative Assessments	Independent Research & Projects	Jigsaw
Choice Boards	Multiple Intelligence Options	Think-Tac-Toe
Games and Tournaments	Project-Based Learning	Cubing Activities
Group Investigations	Varied Supplemental Activities	Exploration by Interest
Guided Reading	Varied Journal Prompts or RAFT Writing	Flexible Grouping
Learning Contracts	Tiered Activities/Assignments	Goal-Setting with Students
Leveled Rubrics	Tiered Products	Homework Options
Literature Circles	Graphic Organizers	Open-Ended Activities
Multiple Texts	Choice of Books/Activities	Use of Reading Buddies
Personal Agendas	Mini-Workshops to Reteach or Extend	Varied Product Choices
	Think-Pair-Share by readiness or interest	Stations/Centers
	Use of Collaboration of Various Activities	Work Alone/Together

CONTENT STANDARD	SUGGESTED MATHEMATICAL PRACTICES	CRITICAL KNOWLEDGE & SKILLS
8.G.A.1 **8.G.A.1a** **8.G.A.1b** **8.G.A.1c** **8.G.A.2** **8.G.A.3** **8.G.A.4** **8.G.A.5**	MP.1 MP.2 MP.3 MP.4 MP.6 MP.7 MP.8	Concept(s): ● Analyze Translations ● Analyze Reflections ● Analyze Rotations ● Compose Transformations ● Mathematical Modeling ● Understand Congruent Figures ● Describe Dilations ● Understand Similar Figures ● Angles, Lines, and Transversals ● Interior and Exterior Angles of Triangles ● Angle-Angle Triangle Similarity Students are able to: ● Understand translations.

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		• Translate a figure on a coordinate plane. • Describe a translation. • Understand and describe a reflection. • Reflect two-dimensional figures. • Identify and perform a rotation. • Determine how a rotation affects a two-dimensional figure. • Understand a sequence of transformations. • Describe and perform a sequence of transformations. • Use mathematical modeling to represent a problem situation and to propose a solution. • Understand congruence of figures using a series of transformations. • Identify congruent figures. • Understand dilations. • Dilate to enlarge or reduce a figure in a coordinate plane. • Understand similarity. • Complete a similarity transformation. • Identify similar figures. • Understand the relationships of angles formed by parallel lines and a transversal. • Find unknown angle measures. • Understand the relationship of the interior angles of a triangle. • Find unknown angle measures. • Determine whether triangles are similar. • Solve problems involving similar triangles. Learning Goal: • A translation (slide) is a transformation that moves every point of a figure the same distance and the same direction. • A reflection (flip) create images that have the same

		size and shape, but different orientation. The preimage and image are the same distance from the line of reflection but on opposite sides. ● A rotation is created by moving each point of the preimage around a fixed point. The image and preimage have the same size, shape, and orientation. ● When one transformation will not map a preimage into its image, a sequence of transformations is needed. ● Many real-world situations can be represented with a mathematical model, but that model may not represent a real-world situation exactly. ● A sequence of translations, reflections, and rotations can map one figure to another without changing its shape or size. ● A dilation is a transformation that changes the size of a figure. In a dilation, the preimage and image have the same shape, angle measures, and proportions. ● Two-dimensional figures are similar if there is a sequence of translations, reflections, rotations, and dilations that map one figure onto the other. ● If parallel lines are intersected by a transversal, then corresponding and alternate interior angles are congruent, and same-side interior angles are supplementary. ● The measure of an exterior angle of a triangle is equal to the sum of the measures of its remote interior angles. ● If two angles in one triangle are congruent to two angles in another triangle, the triangles are similar triangles.

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UNIT 7 FOCUS	
Understand and Apply the Pythagorean Theorem *Pacing: 5 weeks*	
STANDARDS FOR MATHEMATICAL CONTENT	**STANDARDS FOR MATHEMATICAL PRACTICE**
8.G.B	MP.3 Construct viable arguments and critique reasoning. MP.7 Look for and make use of structure.
INTERDISCIPLINARY CONNECTIONS	**UNIT 7 GENERAL ASSESSMENTS**
Interdisciplinary connections may include but are not limited to: STEM Project: “Rainy Days” Next Generation Science Standards: MS-ESS3-1, MS-ESS3-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4	Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Topic Assessment Topic Performance Task

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21st Century Standards **9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.** **9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.** **21st Century Skills: Career Ready Practice Standards:** **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. *Additional interdisciplinary connections to be determined during Curriculum Development Periods*	
RESOURCES	**TECHNOLOGY INTEGRATION**
Lesson Resources	Today's Challenge

Math 8 Curricular Framework

Student Edition Additional Practice Workbook Teaching Resources ● Reteach to Build Understanding ● Additional Vocabulary Support ● Build Mathematical Literacy ● Enrichment	Visual Learning Animation Plus Key Concept Additional Examples 3-Act Mathematical Modeling: “Go with the Flow” STEM Project: ”Rainy Days” Online Practice powered by MathXL Virtual Nerd Video Tutorials Animated Glossary Digital Math Tools Online Math Games **STANDARDS** **8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.** **8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.** **8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.** **8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property.** **8.1.8.D.4 Assess the credibility and accuracy of digital content.** **8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse.** **8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.** Link: NJDOE Technology Standards *Additional technology connections to be determined during Curriculum Development Periods.*
KEY VOCABULARY	

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Converse of the Pythagorean Theorem, hypotenuse, leg, proof, Pythagorean Theorem

GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS		
English Language Learners	**Students Receiving Special Education Services**	**Advanced Learners**
• WIDA Can Do Descriptors for Grades 6-8* • WIDA Essential Actions Handbook • FABRIC Paradigm • Wall Township ESL Grading Protocol *Use WIDA Can Do Descriptors in coordination with Student Language Portraits (SLPs). **Potential Accommodations for ELLs** • Personal glossary • Text-to-speech • Extended time • Simplified / verbal instructions • Frequent breaks • Small group/One to one • Additional time • Review of directions • Student restates information • Extra visual and verbal cues and prompts • Preferential seating • Verbal and visual cues regarding directions and staying on task • Checklists • Immediate feedback	• New Jersey Tiered System of Supports • National Center on Universal Design for Learning - About UDL • UDL Checklist • UDL Key Terms Response to Intervention: Reteach to Build Understanding, Additional Vocabulary Support, Build Mathematical Literacy Students within this class receiving Special Education/Section 504 programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP)/504 Plans due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner. **Potential Accommodations for Special Education**	• Knowledge and Skill Standards in Gifted Education for All Teachers • Pre-K-Grade 12 Gifted Programming Standards • Gifted Programming Glossary of Terms **Potential Accommodations for Advanced Learners** • Use of high level academic vocabulary/texts • Problem-based learning • Pre-assess to condense curriculum • Interest-based research • Authentic problem-solving • Homogeneous grouping opportunities

	Presentation accommodations: ● Listen to audio recordings instead of reading text ● Pre-teach unknown vocabulary through pictures or videos, and relate to prior knowledge ● Work with fewer items per page and/or materials in a larger print size ● Use a visual blocker ● Use visual presentations of verbal material, such as word webs and visual organizers ● Be given a written list of instructions/picture cues **Response accommodations**: ● Give responses in a form (oral or written) that's easier for him/her ● Dictate answers to a scribe ● Capture responses on an audio recorder ● Use a spelling dictionary or electronic spell-checker ● Use a word processor to give responses in class ● Use a calculator or table of "math facts" **Setting accommodations**: ● Work or take a test in a different setting, such as a quiet room with few distractions ● Sit where he/she learns best (for example, near the teacher) ● Take a test in small group setting **Timing accommodations**: ● Take more time to complete a task or a test ● Have extra time to process oral	

	information and directions ● Take frequent breaks, such as after completing a task **Assignment modifications**: ● Complete fewer or different homework problems than peers ● Shorten assignment ● Answer fewer or different test questions ● Create alternate projects or assignments	
		Students with 504 Plans
		Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.

At Risk Learners / Differentiation Strategies		
Alternative Assessments	Independent Research & Projects	Jigsaw
Choice Boards	Multiple Intelligence Options	Think-Tac-Toe
Games and Tournaments	Project-Based Learning	Cubing Activities
Group Investigations	Varied Supplemental Activities	Exploration by Interest
Guided Reading	Varied Journal Prompts or RAFT Writing	Flexible Grouping
Learning Contracts	Tiered Activities/Assignments	Goal-Setting with Students
Leveled Rubrics	Tiered Products	Homework Options
Literature Circles	Graphic Organizers	Open-Ended Activities
Multiple Texts	Choice of Books/Activities	Use of Reading Buddies
Personal Agendas	Mini-Workshops to Reteach or Extend	Varied Product Choices
	Think-Pair-Share by readiness or interest	Stations/Centers
	Use of Collaboration of Various Activities	Work Alone/Together

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CONTENT STANDARD	SUGGESTED MATHEMATICAL PRACTICES	CRITICAL KNOWLEDGE & SKILLS
8.G.B.6 **8.G.B.7** **8.G.B.8**	MP.1 MP.2 MP.3 MP.4 MP.7 MP.8	Concept(s): ● Mathematical Modeling ● Understand the Pythagorean Theorem ● Understand the Converse of the Pythagorean Theorem ● Apply the Pythagorean Theorem to Solve Problems ● Find Distance in the Coordinate Plane Students are able to: ● Use mathematical modeling to represent a problem situation and to propose a solution. ● Test and verify the appropriateness of math models. ● Explain why double the base and the height of a triangle, the area is more than double. ● Apply the Pythagorean Theorem and its converse to solve real-world problems. ● Apply the Pythagorean Theorem to solve problems that involve three dimensions. ● Apply the Pythagorean Theorem to find the distance between two points on a map or coordinate plane. ● Find the perimeter of a figure on a coordinate plane. ● Identify the coordinates of the third vertex of a triangle on the coordinate plane. Learning Goal: ● Many real-world problem situations can be represented with a mathematical model, but that model may not represent a real-world situation exactly. ● The Pythagorean Theorem can be used to determine if a triangle is a right triangle and to find the missing side length of a triangle.

		● If a triangle has side length such that $a^2 + b^2 = c^2$, the triangle is a right triangle. ● The Pythagorean Theorem and its converse can be used to solve real-world problems that involve right triangles. Both can be used to determine the unknown leg lengths of a right triangle, or to identify or verify whether a triangle is a right triangle. ● The Pythagorean Theorem can be used to find the distance between any two points on a coordinate plane by drawing a line to connect the points and using it as the hypotenuse of a right triangle where the legs are horizontal and vertical distances.

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UNIT 8 FOCUS	
Solve Problems Involving Surface Area and Volume *Pacing: 4 weeks*	
STANDARDS FOR MATHEMATICAL CONTENT	**STANDARDS FOR MATHEMATICAL PRACTICE**
8.G.C	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.
INTERDISCIPLINARY CONNECTIONS	**UNIT 8 GENERAL ASSESSMENTS**
Interdisciplinary connections may include but are not limited to: STEM Project: "Wrap It Up" Next Generation Science Standards: MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4, MS-ESS3-3 **21st Century Standards** **9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.** **9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.** **21st Century Skills: Career Ready Practice Standards:** **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.	Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Topic Assessment Topic Performance Task

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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. *Additional interdisciplinary connections to be determined during Curriculum Development Periods*	
RESOURCES	**TECHNOLOGY INTEGRATION**
Lesson Resources Student Edition Additional Practice Workbook Teaching Resources ● Reteach to Build Understanding ● Additional Vocabulary Support ● Build Mathematical Literacy ● Enrichment	Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples 3-Act Mathematical Modeling: "Measure Up" STEM Project: "Wrap it Up" Online Practice powered by MathXL Virtual Nerd Video Tutorials Animated Glossary Digital Math Tools Online Math Games **STANDARDS** **8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.**

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composite figure, cone, cylinder, sphere

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8.G.C.9	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8	Concept(s): ● Find Surface Area of Three-Dimensional Figures ● Find Volume of Cylinders ● Find Volume of Cones ● Find Volume of Spheres ● Mathematical Modeling Students are able to: ● Find the surface areas of cylinders, cones, and

		spheres. ● Recognize the relationship between the volume of a rectangular prism and the volume of a cylinder. ● Solve real-world problems involving the volume of a cylinder. ● Use the formula for the volume of a cylinder to find an unknown measure. ● Recognize the relationship between the volume of a cylinder and the volume of a cone. ● Use the Pythagorean Theorem when solving volume problems. ● Find the volume of a cone. Given the circumference of the base, find the volume of a cone. ● Recognize the relationship between the volume of a cone and the volume of a sphere. ● Find the volume of a composite figure. ● Use mathematical modeling to represent a problem situation and to propose a solution. ● Test and verify the appropriateness of their math models. ● Explain why the results from their mathematical models may not align to the problem situation. Learning Goal: ● Formulas for finding the areas of polygons, such as rectangles, squares, triangles and circles, can be used to find the surface areas of cylinders, cones, and spheres. ● Finding the volume of a cylinder is an extension of finding the volume of a rectangular prism. The volume of a rectangular prism is the product of the area of its base and its height. Similarly, the volume of a cylinder is equal to the product of the area of its circular base and its height.

		● The volume of a cone is ⅓ the volume of a cylinder given that the bases have the same radius and the heights are the same. The formula for the volume of a cone is $V=\frac{1}{3}Bh$, where B is the area of its circular base and h is the height of the cone. ● The volumes of a sphere and cone are proportionally related. The volume of a sphere is twice the volume of a cone that has the same circular base and height. The formula for the volume of a sphere is $V=4/3\pi r^3$ where r is the radius of the sphere. ● Many real-world situation can be represented with a mathematical model, but that model may not represent a real-world situation exactly.