MOUNT HOLLY TOWNSHIP SCHOOL DISTRICT
SEVENTH GRADE MATHEMATICS CURRICULUM

2016 Mathematics Standards with companion June 2020 NJSLS
Board Approval: September 28, 2022

District Administration

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Mrs. Amie Dougherty	Director of Curriculum and Instruction
Mrs. Tifanie Pierce	Director of Special Services
Mrs. Carolyn McDonald	Director of Equity and Student Services
Mr. Daniel Finn	Principal 5-8
Mr. Thomas Braddock	Principal 2-4
Mrs. Nicole Peoples	Principal PreK-2
Mrs. Kinny Nahal	Assist Principal 5-8
Mrs. Evon DiGangi	School Business Administrator

Mount Holly Township Board of Education

Mrs. Janet DiFolco	Board President
Ms. Jennifer Mushinsky	Board Vice-President
Mrs. Brianna Banks	Board Member
Mrs. Janene Ciotti	Board Member
Mr. William Monk	Board Member

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New Jersey Mathematics Standards:
2016 New Jersey Student Learning Standards - Mathematics

New Jersey Computer Science and Design Thinking Standards
2020 New Jersey Student Learning Standards: Computer Science and Design Thinking

New Jersey Career Readiness, Life Literacies, and Key Skills Standards
2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies & Key Skills

Grade Seven Pacing Guide

Mathematics Curriculum	**Grade 7**

Interdisciplinary Connections: The Mathematics Program, My Math/Glencoe Math, links mathematics instruction across multiple disciplines. These interdisciplinary standards are incorporated into each grade level, providing purposeful application and meaningful learning.

Math Discipline	*Connection to other Disciplines*
Domain 1: RP. Ratios and Proportional Reasoning	NJSLSA.R3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text. 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.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

	MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.
Domain 2: NS. The Number System	NJSLSA.R3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text. 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.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
Domain 3: EE. Expressions and Equations	NJSLSA.R3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text. 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.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations. MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

Domain 4: G. Geometry	NJSLSA.R3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text. 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.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
Domain 5: SP. Statistics and Probability	NJSLSA.R3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text. 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.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations. MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Computer Science and Design Thinking

Core Ideas	Performance Expectations
People use digital devices and tools to automate the collection, use, and transformation of data. The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.	8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
Computer models can be used to simulate events, examine theories and inferences, or make predictions.	• 8.1.8.DA.5: Test, analyze, and refine computational models. • 8.1.8.DA.6: Analyze climate change computational models and propose refinements.
Individuals design algorithms that are reusable in many situations. Algorithms that are readable are easier to follow, test, and debug.	8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.
Career Readiness, Life Literacies, and Key Skills	
Financial Institutions/Psychology	
Core Ideas	**Performance Expectations**
There are a variety of factors that influence how well suited a financial institution and/or service will be in meeting an individual's financial needs.	9.1.8.FI.1: Identify the factors to consider when selecting various financial service providers. 9.1.8.FI.2: Determine the most appropriate use of various financial products and services to borrow and access money for making purchases (e.g., ATM, debit cards, credit cards, check books, online/mobile banking). 9.1.8.FI.3: Evaluate the most appropriate financial institutions to assist with meeting various personal financial needs and goals. 9.1.8.FI.4: Analyze the interest rates and fees associated with financial products.

An individual's values and emotions will influence the ability to modify financial behavior (when appropriate), which will impact one's financial well-being.	9.1.8.FP.1: Describe the impact of personal values on various financial scenarios. 9.1.8.FP.2: Evaluate the role of emotions, attitudes, and behavior (rational and irrational) in making financial decisions. 9.1.8.FP.3: Explain how self-regulation is important to managing money (e.g., delayed gratification, impulse buying, peer pressure, etc.). 9.1.8.FP.4: Analyze how familial and cultural values influence savings rates, spending, and other financial decisions. 9.1.8.FP.5: Determine how spending, investing, and using credit wisely contributes to financial well-being.
Planning and Budgeting	
A budget aligned with an individual's financial goals can help prepare for life events.	9.1.8.PB.1: Predict future expenses or opportunities that should be included in the budget planning process. 9.1.8.PB.2: Explain how different circumstances can affect one's personal budget. 9.1.8.PB.3: Explain how to create budget that aligns with financial goals. 9.1.8.PB.4: Construct a simple personal savings and spending plan based on various sources of income and different stages of life (e.g. teenager, young adult, family).
Saving money can impact an individual's ability to address emergencies and accomplish their short-and long-term goals.	9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).
Career Awareness, Exploration, Preparation, and Training	
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.

	9.2.8.CAP.2: Develop a plan that includes information about career areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.
There are resources to help an individual create a business plan to start or expand a business.	9.2.8.CAP.20: Identify the items to consider when estimating the cost of funding a business.
Diversity, Equity, and Inclusion:	
Culturally Responsive Practices in Mathematics Education: **8 Powerful Ways to Promote Equity in the Classroom** **Who Do You Call On? Rooting Out Implicit Bias'** **Why Representation Matters**	
Examining Poverty, Inequity, and Hidden Biases: Lessons addressing financial psychology in Grades 6-8 will include explicit media, lessons, and topics related to the following **essential questions:** ● What problems arise when we relate to people as members of a group, rather than as unique individuals? ● How do power and privilege shape the relationships people have with each other as well as with institutions? ● How is empathy a seed of social action?	Resources: Ben DeSoto 'Understanding Poverty' exhibit Why Chicken Means So Much to Me How Rich are the Super Rich? Average Household Income Graphic Inventing a Better World Lesson

Domain 1: Ratios and Proportional Relationships

Chapter 1: Ratios and Proportional Reasoning (15 days)
Chapter 2: Percents (17 days)

NJ 2016 Student Learning Standards: Mathematics Grade 7

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

1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different unites. *For example, if a person walks ½ mile in each ¼ hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*

2. Recognize and represent proportional relationships between quantities.
   - 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.
   - b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
   - c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.*
   - 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.

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.*

NJDOE Mathematics Curricular Framework Guide Document and Supports	**Mathematical Practices**

Mathematics Curricular Framework	**MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.** **highlight appropriate indicators for unit/domain** MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics. MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
Career Readiness, Life Literacies, and Key Skills Integration **NJSLS - CRLLKS 2020** **highlight appropriate indicators for unit/domain** CRLLKS1. Act as a responsible and contributing community members and employee. CRLLKS2. Attend to financial well-being. CRLLKS3. Consider the environmental, social and economic impacts of decisions. CRLLKS4. Demonstrate creativity and innovation. CRLLKS5. Utilize critical thinking to make sense of problems and persevere in solving them CRLLKS6. Model integrity, ethical leadership and effective	**21st Century Student Outcomes** http://www.battelleforkids.org/networks/p21 **Learning and Innovation Skills** **highlight appropriate indicators for unit/domain** Think Creatively Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Life and Career Skills**

management. CRLLKS7. Plan education and career paths aligned to personal goals. CRLLKS8. Use technology to enhance productivity increase collaboration and communicate effectively.persevere in solving them. CRLLKS9. Work productively in teams while using cultural/global competence. CRP12. Work productively in teams while using cultural global competence.	**highlight appropriate indicators for unit/domain** Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams
Enduring Understandings ● Two quantities that are in proportional relationship can be used to solve real-world and mathematical problems ● Percents represent proportional relationships to 100	**Essential Questions** ● How can you show that two objects are proportional? ● How can percent help you understand situations involving money?
Content Knowledge Determine whether the relationship between two quantities is proportional and solve multi-step problems Find percent of increase and decrease and use percents to solve problems involving sales tax, tips, markups and discounts, and simple interest	**Skills** 1. Identify a direct proportion and recognize that the constant of proportionality can be a constant rate 2. Use a graph to interpret a direct proportion and identify the constant of proportionality 3. Solve real-world direct proportion problems 4. Create direct proportions to solve for the amount of taxes, commissions, mark-up/downs 5. Create direct proportions to solve for the percent of change/percent error

Primary and Supplementary Resources

Glencoe Math Resources
Chapter 1: Ratios and Proportional Reasoning
Chapter 2: Percents

Glencoe Math Online Resources

EdConnect Login

NJSLA Mathematics Operational Evidence Statements
https://docs.google.com/spreadsheets/d/18M5r1jk4P729fTpAlWAzrw1gE6tken233I-Yk0U712M/edit#gid=554025491

NJSLA Released Items
https://nj.digitalitemlibrary.com/home
https://resources.newmeridiancorp.org/

Illustrative Mathematics

iReady
i-Ready makes differentiated instruction a practical reality for teachers and students. *i-Ready*:

- integrates powerful assessments and rich insights with effective and engaging instruction in reading and mathematics to address students' individual needs.
- empowers teachers every day to make more informed instructional decisions.
- motivates students with access to their own personalized path to growth.

XtraMath

- This program helps students practice their math facts for addition, subtraction, multiplication, and addition.
- Can individualize the fluency skills for each student.
- Can run reports to determine progress.

Khan Academy

- ➢ a set of online tools that help educate students. The organization produces short lessons in the form of YouTube videos.
- ➢ Its website also includes supplementary practice exercises and materials for educators.

7th grade Flip Book:
https://drive.google.com/file/d/1Z7cUax2ZKZIX0qLDnd8Owwe9aUoKLepk/view?usp=sharing

101 Math Discourse Questions:
http://www.casamples.com/downloads/100MathDiscourseQuestions_Printable.pdf

Asking Effective Questions
http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_AskingEffectiveQuestions.pdf

Fluency Support for Grades 6-8
https://drive.google.com/file/d/1rNBWYvsveLgDm3JwOx1Ace1iH4aKonyR/view?usp=sharing

Achieve the Core Coherence Map
https://achievethecore.org/coherence-map/7

Assessments:

- ➢ Quiz 1
- ➢ Quiz 2
- ➢ Mid Chapter Assessment
- ➢ End of Chapter Assessment
- ➢ Performance Task
- ➢ Benchmark Assessment
- ➢ Exit tickets

Differentiation in the Mathematics Classroom

Special Education Students

- ➢ Chunk content
- ➢ Small group instruction
- ➢ Notes packets/graphic organizers provided
- ➢ Anchor charts/multiplication charts/reference sheets provided
- ➢ Calculators provided as needed
- ➢ Modified assessments/assignments and extra time given
- ➢ YouTube clips used to supplement content visually
- ➢ Number Lines
- ➢ Vocabulary Enrichment

English Language Learners

- ➢ Create Vocabulary Banks
- ➢ Use manipulatives
- ➢ Modify teacher talk and practice wait time
- ➢ Elicit nonverbal responses, like a thumbs up or down
- ➢ Use sentence frames
- ➢ Comprehensible input
- ➢ Contextualized instruction
- ➢ A low-anxiety learning environment
- ➢ Meaningful engagement in learning activities

At-Risk Students

- ➢ Reduce the number of problems given
- ➢ Provide calculators
- ➢ Give extra time
- ➢ Individualized instruction
- ➢ One-on-one check in
- ➢ Communicate with family
- ➢ iReady

504 Students

- ➢ Provide a checklist of the steps needed to complete the problem
- ➢ Provide place value charts
- ➢ Provide lots of white-space to make it less busy
- ➢ If still struggling, reteach and retest

Gifted and Talented Students

- ➢ Use more-challenging numbers
- ➢ Add additional steps by combining standards
- ➢ Introduce the next-grade-level standard
- ➢ Know Their Interests – Start by having students complete an interest inventory like this one Student Interest Survey
- ➢ Keep Them Active - Gifted students often need to have the ability to move when learning
- ➢ Offer Flexible Seating - Try to offer different seating options for students: beanbag chairs, carpet squares, pillows, director chairs … the list can go on and on.
- ➢ Share Current Events - Current events are important to incorporate into gifted programming. We want these students to be thinking about how they can use their talents to solve real-world problems.
- ➢ Practice Like Professionals - Allow students to practice like the professionals. Use the same processes that professionals use.

➢ Locate Authentic Audiences - The work students create should have a real audience and be appreciated by those who authentically would benefit from its completion. Younger students are a great first authentic audience.

Domain 2: The Number System

Chapter 3: Integers
Chapter 4: Rational Numbers

NJ 2016 Student Learning Standards: Mathematics Grade 7

7.NS.A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

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

- a. Describe situations in which opposite quantities combine to make 0
- 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.
- c. Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that 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.
- d. Apply properties of operations as strategies to add and subtract rational numbers.

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

- 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.
- 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.
- c. Apply properties of operations as strategies to multiply and divide rational numbers.
- 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.

3. Solve real-world and mathematical problems involving the four operations with rational numbers.[1]

NJDOE Mathematics Curricular Framework Guide Document and Supports Mathematics Curricular Framework	**Mathematical Practices** **MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.** **highlight appropriate indicators for unit/domain** MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics. MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
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highlight appropriate indicators for unit/domain CRLLKS1. Act as a responsible and contributing community members and employee. CRLLKS2. Attend to financial well-being. CRLLKS3. Consider the environmental, social and economic impacts of decisions. CRLLKS4. Demonstrate creativity and innovation. CRLLKS5. Utilize critical thinking to make sense of problems and persevere in solving them CRLLKS6. Model integrity, ethical leadership and effective management. CRLLKS7. Plan education and career paths aligned to personal goals. CRLLKS8. Use technology to enhance productivity increase collaboration and communicate effectively.persevere in solving them. CRLLKS9. Work productively in teams while using cultural/global competence.	**Learning and Innovation Skills** **highlight appropriate indicators for unit/domain** Think Creatively Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Life and Career Skills** **highlight appropriate indicators for unit/domain** Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams
Enduring Understandings ● The operations of addition, subtraction, multiplication, and division can be applied to rational numbers, including negative numbers ● Real numbers are represented as points on an infinite line and are used to count, measure, estimate, or approximate values	**Essential Questions** ● What happens when you add, subtract, multiply, and divide integers? ● What happens when you add, subtract, multiply, and divide fractions?

Content Knowledge	**Skills**
● Add, subtract, multiply and divide integers ● Solve multi-step real-life problems by performing operations on rational numbers	1. Add integers with the same signs and different signs 2. Subtract integers by adding their opposites and find the distance between two numbers on a number line 3. Multiply and divide integers 4. Use addition, subtraction, multiplication, and division with integers 5. Add, subtract, multiply and divide rational numbers 6. Add, subtract, multiply and divide decimals and percents 7. Find the absolute value of rational numbers, express numbers in m/n form, and locate rational numbers on the number line 8. Use long division to represent rational number as decimals and compare rational numbers on the number line 9. Approximate the value of irrational numbers on a number line 10. Compare rational and irrational numbers on a number line

Primary and Supplementary Resources

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Chapter 4: Rational Numbers

Glencoe Math Online Resources

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https://resources.newmeridiancorp.org/

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- motivates students with access to their own personalized path to growth.

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- This program helps students practice their math facts for addition, subtraction, multiplication, and addition.
- Can individualize the fluency skills for each student.
- Can run reports to determine progress.

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- a set of online tools that help educate students. The organization produces short lessons in the form of YouTube videos.
- Its website also includes supplementary practice exercises and materials for educators.

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101 Math Discourse Questions:
http://www.casamples.com/downloads/100MathDiscourseQuestions_Printable.pdf

Asking Effective Questions
http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_AskingEffectiveQuestions.pdf

Fluency Support for Grades 6-8
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- Vocabulary Enrichment

English Language Learners

- Create Vocabulary Banks
- Use manipulatives
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- A low-anxiety learning environment
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At-Risk Students ➢ Reduce the number of problems given ➢ Provide calculators ➢ Give extra time ➢ Individualized instruction ➢ One-on-one check in ➢ Communicate with family ➢ iReady	**504 Students** ➢ Provide a checklist of the steps needed to complete the problem ➢ Provide place value charts ➢ Provide lots of white-space to make it less busy ➢ If still struggling, reteach and retest
Gifted and Talented Students ➢ Use more-challenging numbers ➢ Add additional steps by combining standards ➢ Introduce the next-grade-level standard ➢ Know Their Interests – Start by having students complete an interest inventory like this one Student Interest Survey ➢ Keep Them Active - Gifted students often need to have the ability to move when learning ➢ Offer Flexible Seating - Try to offer different seating options for students: beanbag chairs, carpet squares, pillows, director chairs … the list can go on and on. ➢ Share Current Events - Current events are important to incorporate into gifted programming. We want these students to be thinking about how they can use their talents to solve real-world problems. ➢ Practice Like Professionals - Allow students to practice like the professionals. Use the same processes that professionals use. ➢ Locate Authentic Audiences - The work students create should have a real audience and be appreciated by those who authentically would benefit from its completion. Younger students are a great first authentic audience.	

Domain 3: Expressions and Equations
Chapter 5: Expressions Chapter 6: Equations and Inequalities
NJ 2016 Student Learning Standards: Mathematics Grade 7

7.EE.A. Use properties of operations to generate equivalent expressions.

1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*

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

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. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*

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.

- a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
- b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*

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CRLLKS8. Use technology to enhance productivity increase collaboration and communicate effectively.persevere in solving them. CRLLKS9. Work productively in teams while using cultural/global competence.	Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams
Enduring Understandings ● Algebraic expressions containing rational numbers and several variables can be simplified, expanded, or factored to write equivalent expressions ● Algebraic equations and inequalities can be used to model mathematical or real-world situations and to find the value of the variables	**Essential Questions** ● How can you use numbers and symbols to represent mathematical ideas? ● What does it mean to say two quantities are equal?
Content Knowledge ● Apply the properties of operations to simplify and evaluate algebraic expressions ● Use the properties of equality to solve equations and inequalities algebraically	**Skills** 1. Add algebraic terms with fractional and decimal coefficients 2. Subtract algebraic terms with fractional and decimal coefficients 3. Simplify algebraic expressions with more than two terms and two variables 4. Expand algebraic expressions involving fractions, decimals, and negative factors 5. Factor algebraic expressions with two variables and negative terms 6. Translate verbal descriptions into algebraic expressions

	with one or more variables and using parentheses 7. Solve real-world problems using algebraic reasoning 8. Identify equivalent equations 9. Solve algebraic equations with variables on the same side of the equation, with variables on both sides, and in factored form 10. Solve real-world problems algebraically 11. Solve multi-step algebraic inequalities and graph the solution set 12. Solve real-world algebraic inequalities

Primary and Supplementary Resources

Glencoe Math Resources
Chapter 5: Expressions
Chapter 6: Equations and Inequalities

Glencoe Math Online Resources

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Domain 4: Geometry
Chapter 7: Geometric Figures Chapter 8: Measure Figures
NJ 2016 Student Learning Standards: Mathematics Grade 7

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

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.

2. Draw (with technology, with ruler and protractor, as well as freehand) 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.

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. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

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.

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.

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.

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collaboration and communicate effectively.persevere in solving them. CRLLKS9. Work productively in teams while using cultural/global competence.	Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams
Enduring Understandings ● Angles formed on a straight line, or by parallel lines and a transversal, have special properties that are useful in solving problems ● Triangles and quadrilaterals can be constructed using a compass, a protractor, and a straightedge ● Solids such as pyramids, cylinders, cones, prisms, and spheres are all around you. You can find their surface areas and volumes using their given dimensions to solve real-world problems	**Essential Questions** ● How does geometry help us describe real-world objects? ● How do measurements help you describe real-world objects?
Content Knowledge ● Draw two- and three-dimensional figures and solve problems involving scale drawings of geometric figures ● Use formulas to find area and circumference of a circle and to find the surface area and volume of prisms and pyramids	**Skills** 1. Explore and apply the properties of complementary, supplementary, and adjacent angles 2. Explore and apply the properties of vertical angles and angles that share a vertex 3. Create equations to solve for unknown angles by applying the properties of AI, AE, and Corresponding angles 4. Create algebraic equations to solve for interior and exterior angles of a triangle 5. Construct a triangle with given conditions and determine

	whether a unique triangle, more than one triangle, or no triangle can be drawn from given side lengths 6. Identify the scale factor in a diagram and solve problems using scale drawings of geometric figures 7. Recognize the cross sections of cylinders, cones, pyramids, prisms, and spheres 8. Use the given dimensions to solve for volume and surface area of cylinders and prisms 9. Use the given dimensions to solve for volume and surface area of pyramids and cones 10. Use the given dimensions to solve for volume and surface area of spheres 11. Use formulas and dimensions to solve for the volume and surface area of composite solids

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Domain 5: Statistics and Probability

Chapter 9: Probability
Chapter 10: Statistics

NJ 2016 Student Learning Standards: Mathematics Grade 7

7.SP.A. Use random sampling to draw inferences about a population.

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.

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

7.SP.B. Draw informal comparative inferences about two populations.

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

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

7.SP.C. Investigate chance processes and develop, use, and evaluate probability models.

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

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

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

- a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*
- b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*

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

- a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
- b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.
- c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*

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Enduring Understandings	**Essential Questions**
● Measures of central tendency can be used to estimate the center of data. Measures of variation estimate how far data are spread out from the center. These measures are used to draw conclusions about populations. ● Events happen around you every day, some more likely than others. You can use probability to describe how likely an event is to occur.	● How can you predict the outcome of future events? ● How do you know which type of graph to use when displaying data?
Content Knowledge	**Skills**
● Develop probability models and find probabilities of simple and compound events ● Use random samples to make predictions and compare populations	1. Understand and solve problems by calculating and interpreting the quartiles and interquartile range 2. Represent and make conclusions from data using a stem and leaf plot 3. Draw and interpret box plots, calculate and interpret Mean Absolute Deviation 4. Understand and apply different random sampling methods and simulate random sampling 5. Make and use inferences about one (or more) populations to estimate its population mean 6. Understand and apply the concepts of outcomes, events, population and sample space to everyday events 7. Use a Venn Diagram to illustrate events and find the 8. probability of real-world events 9. Find and compare relative frequencies and use them to make predictions 10. Understand and apply uniform and non-uniform probability models and compare experimental probability with theoretical probability

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