Wall Township Public Schools	Board Approval Date: 8/19/2025

Course Title: Math 7

Course Description: In Grade 7, instruction focuses broadly on four critical areas:
(1) developing understanding of and applying proportional relationships;
(2) developing understanding of operations with rational numbers and working with expressions and linear equations;
(3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and
(4) drawing inferences about populations based on samples.*
**See the end of document for additional information related to the critical areas of focus.*

New Jersey Student Learning Standards - Mathematics

Vision for Mathematics Education in New Jersey
A New Jersey education in Mathematics builds quantitatively and analytically literate citizens prepared to meet the demands of college and career, and to engage productively in an information-driven society. All students will have access to a high-quality mathematics education that fosters a population that:

- leverages data in decision-making and as a lens for discussing, analyzing, and responding to practical questions.
- persists to make sense of and model problems arising in everyday life, society, and the workplace.
- thinks critically and strategically to assess quantitative relationships and to solutions to complex problems.
- employs precise reasoning and constructs viable arguments to deduce conclusions, recognize false statements and assess peers' reasoning.
- interprets, evaluates and critiques the mathematics embedded in social, scientific and commercial systems, as well

as the claims made in the private and public sectors.
- communicates precisely when conveying, representing, and justifying both qualitative and quantitative perspectives.

Standards for Mathematical Practice*

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report Adding It Up: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

**See end of document for additional information related to the mathematical practices.*

Inclusion of Climate Change Opportunities

( ) notes opportunities to integrate specific examples of climate change education provided by additional age-appropriate resources

The goal of inclusion of climate change education implementation is to foster generations of New Jersey students that can analyze, question, interpret, to think independently, and bring critical deduction to fulfill, and to lead in jobs created by burgeoning industries of the future green economy.

Grade 7 Overview	
Domain	**Cluster Headings**
Ratio and Proportional Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.
The Number System	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
Expressions and Equations	Use properties of operations to generate equivalent expressions. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
Geometry	Draw, construct and describe geometrical figures and describe the relationships between them. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
Statistics and Probability	Use random sampling to draw inferences about a population. Draw informal comparative inferences about two populations. Investigate chance processes and develop, use, and evaluate probability models.

Course Sequence & Pacing	
Unit Title	**Estimated Number of Instructional Periods** Days, w/Optional , with additional learning activities included**
Unit 1: Scale Drawings	14, 16, 20
Unit 2: Introducing Proportional Relationships	17, 18, 22
Unit 3: Measuring Circles	11, 15, 18
Unit 4: Proportional Relationships and Percentages	16, 18, 22
Unit 5: Operations With Positive and Negative Numbers	17, 16, 21
Unit 6: Expressions, Equations, and Inequalities	20, 22, 30
Unit 7: Angles, Triangles, and Prisms	14, 18, 22
Unit 8: Probability and Sampling	14, 20, 25
Total Instructional Periods	123, 143, 180

**Instructional periods are scheduled for 54 minutes.

Unit 1

Desired Results

Unit 1 Title: Scale Drawings

Unit Summary: Students examine and create scaled copies of figures, as well as explore scale drawings of real-life objects.

Sub-Unit 1: Scaled Copies (Lessons 1–5 + Practice Day + Quiz)

- Describe how scaling affects lengths, angles, and areas in scaled copies
- Use scale factors to create and compare scaled copies.
- Analyze how scaling affects lengths, angles, and areas in scaled copies using mathematically precise language.

Sub-Unit 2: Scale Drawings (Lessons 6–11 + Practice Day + Quiz)

- Represent distances in the real world using scales and scale drawings.
- Analyze strategies for creating a scale drawing to represent actual distances and areas using mathematically precise language.

Learning Standards

NJSLS Math:

7.G Geometry

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.

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

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.

7.RP Ratios and Proportional Relationships

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 units. *For example, if a person walks*

$\frac{1}{2}$ *mile in each* $\frac{1}{4}$ *hour, compute the unit rate as the complex fraction* $\left(\frac{1}{2}\right)/\left(\frac{1}{4}\right)$ *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.

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.*

Math Practices: MP1, MP2, MP3, MP4, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

Students will be able to,

Act as a responsible and contributing community member and employee.
Attend to financial well-being in their life and career.
Consider the environmental, social and economic impacts of decisions.
Demonstrate creativity and innovation throughout their life and career.
Utilize critical thinking to make sense of problems and persevere in solving them.
Model integrity, ethical leadership and effective management.
Plan education and career paths aligned to personal goals.
Use technology to enhance productivity, increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).

9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).

9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.

9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Computer Science & Design Thinking (*CS & DT***):** *The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world. Computational thinking is at the heart of the practices and refers to the thought processes involved in expressing solutions as computational steps that can be carried out by a computer. It requires understanding the capabilities of computers, formulating problems addressed by a computer, and designing algorithms that a computer can execute. Curriculum writers and educators will want to consider how they can design learning experiences that will enable their students to develop these skills in conjunction with the content knowledge reflected in the core ideas and performance expectations.* components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form. 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices. 8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets	
Unit Essential Questions: How can you tell whether a figure is a scaled copy of another figure? How are lengths, angles, and areas affected when creating scaled copies? How do scales and scale drawings help bring the world to a more manageable size?	**Unit Enduring Understandings:** A figure is a scaled copy of another if their corresponding sides are proportional and their corresponding angles are equal.

	When figures are scaled, the side lengths change by a constant factor, angles stay the same, and the area changes by the scale factor. Scale drawings and scale factors help us represent real-world objects and spaces in smaller or larger, more manageable sizes while keeping their proportions accurate.
Vocabulary: proportional, scale, scale drawing, scale factor, scaled copy	

Students will be able to:

1. **What Are Scaled Copies?:** Describe characteristics of scaled copies and create scaled copies using equivalent ratios. *7.G.A.1 7.RP.A.2.A MP2 MP7*
2. **Lengths and Scaled Copies:** Scale figures by applying a scale factor to each length in the figure. *7.G.A.1 7.RP.A 7.RP.A.2 MP7*
3. **Drawing Scaled Copies**: Draw accurate scaled copies on a grid by applying knowledge of scale factor. *7.G.A.1 MP3 MP5*
4. **Effects of Scale Factors:** Determine which scale factors create a copy that is larger, smaller, or the same size as the original. *7.G.A.1 7.RP.A.2.B MP6 MP7*
5. **Scaling and Area:** Explore how different scale factors affect the area of scaled copies. *7.G.A.1 7.G.B.6 MP1 MP3 MP8*
6. **Comparing Scale Factor and Scale:** Explore how scale is used to represent distances in the real world. *7.G.A.1 MP2*
7. **Scale Drawings:** Determine actual and scaled distances from a scale drawing. *7.G.A.1 7.G.B.6 7.RP.A.3 MP2 MP4*

8. **Creating Scale Drawings:** Create scale drawings given the actual dimensions of an object and the scale. *7.G.A.1 MP6*
9. **Creating Scale Drawings:** Create scale drawings of the same object using different scales. *7.G.A.1 MP7*
10. **Same Object, Different Scales:** Calculate distances on a scale drawing, given a drawing of the same object with a different scale. *7.G.A.1 MP6 MP7*
11. **Scale and Scale Factor*:** Create logos by choosing appropriate scales for scale drawings of specific sizes. *7.G.A.1 MP1 MP6*

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

**Optional Lesson*

Learning Activities: *Suggested or Potential Learning Activities*

Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons. The following activities will be used to supplement learning:

- Math IXL Skill Practice and Group Jams based on each lesson. IXL Learning engages students in an authentic way, encouraging them to own their learning, embrace new challenges, and build skills and confidence that last. The program offers personalized skills recommendations based on what each student has been practicing and what they are ready to learn next.
- Education.com practice based on each lesson. Education.com worksheets provide students with extra practice to reinforce key concepts and strengthen their skills. By offering a variety of exercises tailored to different learning levels, these worksheets help students build confidence, improve retention, and master challenging topics through consistent, hands-on practice.
- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of

all students.

Students will work in Math IXL and DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Amplify Desmos Lesson 1 "Scaling Machines" - What Are Scaled Copies

Day 2: Amplify Desmos Lesson 2 "Scaling Robots" - Lengths and Scaled Copies

Day 3: Practice Day: Activities are included in the table below*.

Day 4: Amplify Desmos Lesson 3 "Make It Scale" - Drawing Scaled Copies

Day 5: Amplify Desmos Lesson 4 "Scale Factor Challenges" - Effects of Scale Factors

Day 6: Practice Day: Activities are included in the table below*.

Day 7: Amplify Desmos Lesson 5 "Tiles" - Scaling and Area

Day 8: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–5. Consider using this time to prepare for the upcoming quiz.

Day 9: Amplify Desmos Lesson 1-5 Sub-Unit Quiz

Day 10: Amplify Desmos Lesson 6 "Introducing Scale" - Comparing Scale Factor and Scale

Day 11: Amplify Desmos Lesson 7 "Will It Fit" - Scale Drawings

Day 12: Practice Day: Activities are included in the table below*.

Day 13: Amplify Desmos Lesson 8 "Scaling States, Part 1" - Creating Scale Drawings

Day 14: Amplify Desmos Lesson 9 "Scaling States, Part 2" - Creating Scale Drawings

Day 15: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 6-9. Consider using this time to prepare for the upcoming quiz.

Day 16: Amplify Desmos Lesson 6-9 Sub-Unit Quiz 2

Day 17: Amplify Desmos Lesson 10 "Scale Buildings" - Same Object, Different Scales

Day 18: Amplify Desmos Lesson 11 "Team Spirit (Optional)" - Scale and Scale Factor

Day 19: Amplify Desmos Practice Day (Test Review): Practice the concepts and skills developed during Lessons 1–11. Consider using this time to prepare for the upcoming assessment.

Day 20: Amplify Desmos 7.1 End of Unit Assessment

Pacing Considerations

Lesson 4: This lesson supports students in developing a conceptual understanding of scaling and scale factor, which will be addressed in more depth in upcoming lessons. If students show a strong understanding of scale drawings in earlier lessons and in Problem 1 of the Pre-Unit Check, this lesson may be omitted. If omitted, be sure to discuss how the scale factor that takes one figure to another figure relates to the scale factor that takes the

second figure back to the first.

Lessons 8–9: These lessons support students in creating scale drawings using different scale factors. They could be condensed into one class period by completing Activity 1 from each lesson.

Optional Lesson 11: This lesson gives students an opportunity to use their creativity and personal experiences to apply the concepts they learned in this unit to choose an appropriate scale for a logo. This lesson can be omitted because there is no new content introduced in this lesson.

Activities for Unit 1: Amplify Lesson's 1-11*

IXL Skills for the Lesson	**Delta Math Skills for the Lesson**	**Education.com Resources for the Lesson**
• ZFM-L2 Identify Equivalent Ratios • LQR-L3 Write an Equivalent Ratio • DJ8-L4 Equivalent Ratio Word Problems • WEA-DD1 Scale Drawings of Polygons • 84H-DD2 Scale Drawings Word Problems • KCM-DD3 Scale Drawings: Scale Factor Word Problems • ZC6-DD4 Perimeter and Area: Changes in Scale	• Find the Scale Factor • Scaling Numbers (Level 1) • Scaling Numbers (Level 2) • Find the Scale Factor (Level 2) • Scaled Figures Level 1 • Scaled Figures Level 2 • Scaled Figures Level 3 • Create Scaled Drawings on a Grid (Level 1) • Create Scaled Drawings on a Grid (Level 2) • Scale Word Problems (L1) • Scale Word Problems (L2)	• Find Areas Using Scale Drawings • Find Dimensions Using Scale Drawings • Find Dimensions from Scale Drawings: Word Problems • Finding Area from Scale Drawings: Word Problems • Find the Scale Factor #1, #2, #3 • Scale Drawings: Find the Missing Side Length #1, #2, #3

Additional Activities	Understanding Scale Drawings

***G.B.6 Activity:** Design an Energy-Efficient Home for a Changing Climate

Learning Objectives:

- Students will learn about the impact of building design on energy efficiency and climate change.
- Students will apply their knowledge of area, volume, and surface area to calculate the properties of their building designs.
- Students will solve real-world problems related to minimizing heat loss and maximizing energy efficiency through building design.

Activity Steps:

1. Introduce Climate Change and its Impact on Buildings: Begin by discussing how climate change affects our environment and the need for sustainable practices, including energy-efficient buildings. Explain that buildings consume significant amounts of energy for heating and cooling, contributing to greenhouse gas emissions.
2. Explore the Surface Area to Volume Ratio: Introduce the concept of the surface area to volume ratio and explain how it relates to heat loss in buildings. A building with a larger surface area relative to its volume loses more heat, requiring more energy for heating and cooling.
3. Design Sustainable Building Models: Divide students into groups and challenge them to design and build models of sustainable houses or buildings using everyday materials (cardboard, construction paper, etc.). Encourage them to consider various shapes and features that can minimize heat loss, such as:
    1. Compact shapes: A cube is the most reasonable shape for a house to minimize heat transfer. Encourage students to explore other compact shapes.

2. Insulation: Explain the importance of insulation and how different materials have different R-values (thermal resistance).
3. Passive solar design: Incorporating features like south-facing windows to capture sunlight in winter and strategically placed shading for summer.
4. Green roofs or walls: Discuss how these can help regulate temperature and improve energy efficiency.

4. Calculate Area, Volume, and Surface Area: Have students calculate the surface area, volume, and surface area to volume ratio of their building models using the standard formulas for triangles, quadrilaterals, polygons, cubes, and right prisms.
5. Analyze and Compare Designs: Students can compare the surface area to volume ratios of their different designs and discuss how these differences might affect energy efficiency. They can present their findings to the class and explain their design choices in terms of sustainability.

Real-world Connections:

- This activity connects to the real-world problem of designing energy-efficient buildings to reduce our carbon footprint and mitigate climate change.
- Students can research sustainable architecture examples and discuss how architects apply geometry and calculations to create energy-efficient structures.
- They can also research local building codes or programs related to energy efficiency and how they incorporate geometric calculations.

Extension Activities:

- Students can research and calculate the heat loss of different building materials used in their models based on their R-values and the surface area of the building.
- They can explore different architectural software or online tools that are used to calculate energy efficiency in buildings.

- Students can design a model of a school building or other community building and calculate its energy efficiency.

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz Lessons 1-5, Sub-Unit Quiz Lessons 6-9, Show What You Know

Summative Assessments: End-of-Unit Assessment

Common Benchmark Assessments: Common Cumulative Assessment

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • blank sheets of paper (Lesson 9) • calculators (Lesson 9) • index cards (Lesson 3) • graph paper (Lessons 3, 5, 10–11) • rulers (Lessons 7–9, 11)

Math IXL Flex Diagnostic & Practice , Education.com, Delta Math, LinkIt!

Accommodations and Modifications:
Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:

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

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Specific Strategies and Practices that Support English Language Learners

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning

-Enrichment/Extension Activities within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Unit 2

Desired Results

Unit 2 Title: Introducing Proportional Relationships

Unit Summary: Students explore proportional relationships in a variety of real-world contexts and make comparisons using representations such as tables, equations, and graphs.

Sub-Unit 1: Proportional Relationships in Tables (Lessons 1–3 + Practice Day + Quiz)

- Use tables to recognize proportional relationships
- Determine a constant of proportionality from a table.

Sub-Unit 2: Proportional Relationships in Equations (Lessons 4–7 + Practice Day + Quiz)

- Write and use equations to describe proportional relationships.
- Determine a constant of proportionality from an equation.

Sub-Unit 3: Proportional Relationships in Graphs (Lessons 8–10 + Practice Day + Quiz))

- Use graphs to recognize proportional relationships.
- Determine a constant of proportionality from a graph.

Sub-Unit 4: Using Proportional Relationships (Lessons 11–13 + Practice Day)

- Use proportional relationships to solve real-world and mathematical problems.

Learning Standards

NJSLS Math:

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

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.

Math Practices: MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8

Interdisciplinary Connections
Career Readiness, Life Literacies, & Key Skills *(CLKS)*: Students will be able to, Act as a responsible and contributing community members and employee. Attend to financial well-being in their life and career. Consider the environmental, social and economic impacts of decisions. Demonstrate creativity and innovation throughout their life and career. Utilize critical thinking to make sense of problems and persevere in solving them. Model integrity, ethical leadership and effective management. Plan education and career paths aligned to personal goals. Use technology to enhance productivity, increase collaboration and communicate effectively. Work productively in teams while using cultural/global competence. **9.4.8.CT.2:** Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1–4, 6.1.8.CivicsDP.1). **9.4.8.DC.2:** Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). **9.4.8.IML.2:** Identify specific examples of distortion, exaggeration, or misrepresentation of information. **9.4.8.TL.3:** Select appropriate tools to organize and present information digitally.
Computer Science & Design Thinking *(**CS & DT****)*:**

The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world. Computational thinking is at the heart of the practices and refers to the thought processes involved in expressing solutions as computational steps that can be carried out by a computer. It requires understanding the capabilities of computers, formulating problems addressed by a computer, and designing algorithms that a computer can execute. Curriculum writers and educators will want to consider how they can design learning experiences that will enable their students to develop these skills in conjunction with the content knowledge reflected in the core ideas and performance expectations. components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form.

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
What does it mean for two things to be proportionally related? How can you tell when two things are proportionally related?	Two quantities are proportionally related when they have a constant ratio or rate, meaning one quantity is a constant multiple of the other. Proportional relationships can be identified by checking for a constant ratio between corresponding values, using tables, graphs, equations, or verbal descriptions.

Vocabulary: constant of proportionality, coordinate plane. equivalent ratios, origin, proportional relationship

Students will be able to:

1. **Using Equivalent Ratios:** Explore equivalent ratios and have initial, informal conversations about the key ideas in proportional relationships. *7.RP.A MP6 MP7*
2. **Introducing Proportional Relationships With Tables:** Explore proportional relationships and analyze tables of equivalent ratios. *7.RP.A 7.RP.A.2 7.RP.A.2.A MP7*
3. **Constant of Proportionality:** Determine, interpret, and use constants of proportionality to make sense of proportional relationships. *7.RP.A 7.RP.A.1 7.RP.A.2.A 7.RP.A.2.B MP2*
4. **Proportional Relationships and Equations:** Use repeated reasoning about tables to write equations for proportional relationships. *7.RP.A.2 7.RP.A.2.C MP8*
5. **More Equations of Proportional Relationships:** Write and interpret equations that represent proportional relationships. *7.RP.A.2 7.RP.A.2.B 7.RP.A.2.C MP2*
6. **Two Equations for Each Relationship:** Find the two constants of proportionality for a proportional relationship, discover they are reciprocals, and use them to write two equations representing the relationship. *7.RP.A 7.RP.A.2 7.RP.A.2.B 7.RP.A.2.C MP2*
7. **Equations of Proportional Relationships:** Compare proportional and nonproportional relationships. *7.RP.A.2 7.RP.A.2.A 7.RP.A.2.C MP1 MP7*
8. **Introducing Graphs of Proportional Relationships:** Explore what a proportional relationship looks like graphically. *7.RP.A.2 7.RP.A.2.A MP2 MP7*
9. **Interpreting Graphs of Proportional Relationships:** Use graphs to identify constants of proportionality. *7.RP.A.2 7.RP.A.2.B 7.RP.A.2.D MP8*
10. **Proportional Relationships and Graphs:** Use graphs and equations to compare proportional relationships. 7.RP.A.2 7.RP.A.2.A 7.RP.A.2.B 7.RP.A.2.C MP1 MP2
11. **Connecting Descriptions, Tables, Graphs, and Equations:** Connecting Descriptions, Tables, Graphs, and Equations. 7.RP.A.2
12. **Let's Put It to Work:** Use proportional relationships to model the water usage of baths and showers. 7.EE.B.4 7.RP.A.2 MP4

13. **Let's Put It to Work:** Reflect on how the mathematical modeling process offers insight into a real-world context. *7.RP.A.2 MP5*

Learning Activities: *Suggested or Potential Learning Activities*

Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons. The following activities will be used to supplement learning:

- Math IXL Skill Practice and Group Jams based on each lesson. IXL Learning engages students in an authentic way, encouraging them to own their learning, embrace new challenges, and build skills and confidence that last. The program offers personalized skills recommendations based on what each student has been practicing and what they are ready to learn next.
- Education.com practice based on each lesson. Education.com worksheets provide students with extra practice to reinforce key concepts and strengthen their skills. By offering a variety of exercises tailored to different learning levels, these worksheets help students build confidence, improve retention, and master challenging topics through consistent, hands-on practice.
- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students.

Students will work in Math IXL and DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Amplify Desmos Lesson 1 "Paint" - Using Equivalent Ratios

Day 2: Amplify Desmos Lesson 2 "Balloon Float" - Introducing Proportional Relationships With Tables

Day 3: Amplify Desmos Lesson 3 "Sugar, Spice, and Everything Nice" - Constant of Proportionality

Day 4: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills

developed during Lessons 1–3. Consider using this time to prepare for the upcoming quiz.

Day 5: Amplify Desmos Lesson 1-3 IXL Quiz

Day 6: Amplify Desmos Lesson 4 "Robot Factory" - Proportional Relationships and Equations

Day 7: Amplify Desmos Lesson 5 "Snapshots" - More Equations of Proportional Relationships

Day 8: Practice Day: Activities are included in the table below*.

Day 9: Amplify Desmos Lesson 6 "Two and Two" - Two Equations for Each Relationship

Day 10: Amplify Desmos Lesson 7 "All Kinds of Equations" - Equations of Proportional Relationships

Day 11: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–7. Consider using this time to prepare for the upcoming quiz.

Day 12: Amplify Desmos Lesson 1-7 Sub-Unit Quiz

Day 13: Amplify Desmos Lesson 8 "DinoPops" - Introducing Graphs of Proportional Relationships

Day 14: Amplify Desmos Lesson 9 "Gallon Challenge" - Interpreting Graphs of Proportional Relationships

Day 15: Amplify Desmos Lesson 10 "Three Turtles" - Proportional Relationships and Graphs

Day 16: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 8-10. Consider using this time to prepare for the upcoming quiz.

Day 17: Amplify Desmos Lesson 8-10 IXL Quiz

Day 17: Amplify Desmos Lesson 11 "Four Representations" - Connecting Descriptions, Tables, Graphs and Equations

Day 18: Practice Day: Activities are included in the table below*.

Day 19: Amplify Desmos Lesson 12 "Water Efficiency, Part 1" - Let's Put it to Work

Day 20: Amplify Desmos Lesson 13 "Water Efficiency, Part 2" - Let's Put it to Work

Day 21: Amplify Desmos Practice Day (Test Review): Practice the concepts and skills developed during Lessons 1–13. Consider using this time to prepare for the upcoming assessment.

Day 22: Amplify Desmos 7.2 End of Unit Assessment

Pacing Considerations

Lesson 1: This lesson supports students in developing their understanding of key ideas about proportional relationships, which will be addressed in more depth in upcoming lessons. If most students demonstrate a strong understanding of proportional relationships, this lesson may be omitted.

Lesson 5: This lesson supports students in developing fluency writing and using equations to make sense of proportional relationships. If students show a strong understanding working with equations of proportional relationships in earlier lessons, this lesson may be omitted. If omitted, be sure to discuss how

each part of an equation of a proportional relationship relates to a situation in Lessons 6, 7, and 10.

Lesson 11: This lesson gives students an opportunity to connect descriptions, tables, equations, and graphs of proportional relationships. There is no new content introduced in this lesson.

Lessons 12–13: This lesson gives students an opportunity to use their creativity and personal experiences to apply the concepts they learned in this unit to explore whether baths or showers use more water. There is no new content introduced in these lessons.

Activities for Unit 2: Lesson's 1-13*

IXL Skills for the Lesson	**Delta Math Skills for the Lesson**	**Education.com Resources for the Lesson**
• 2NB-L5 Unit Rates • MJQ-L8 DO the Ratios Form a Proportion? • TDA-L11 Solve Proportions • WB7-L12 Solve Proportion Word Problems • LKZ-N1 Find the Constant of Proportionality from a Table. • 6GU-N2 Write Equations for Proportional Relationships from Tables	• Constant of Proportionality from Context • Proportional Reasoning (Fractions and Decimals) • Compare Rate of Change, Proportional Representations • Comparing Rates with Conversions • Proportional Representations • Interpret Features of a Proportional Graph	• Identify Proportional Relationships From Tables • Identify the Constant of Proportionality From Tables (2) • Writing Equations for Proportional Relationships: Tables • Writing Equations for Proportional Relationships: Word Problems • Identify Proportional Relationships From Graphs

• AAN-N3 Identify Proportional Relationships by Graphing • ZUT-N4 Find the Constant of Proportionality from a graph • JKH-N5 Write Equations from Proportional Relationships from Graphs • NB5-N6 Identify Proportional Relationships from Graphs and Equations • 6V7-N7 Identify Proportional Relationships from Tables • 5DR-N8 Complete a Table and Graph Proportional Relationship. • FJW-N9 Graph a Proportional Relationship: Word Problems. • RMH-N10 Interpret Graphs of Proportional Relationships • VKK-N11 Write and Solve Equations for Proportional Relationships.	• Interpret Features of a Proportional Graph Level 2 • Equation of a Proportional Graph • Proportional Equation With Table/Context	• Identify the Constant of Proportionality From a Graph (2) • Graphing Proportional Relationships (3) • Interpreting Graphs of Proportional Relationships • Constant of Proportionality: Tables, Graphs, and Equations • Comparing Proportional Relationships • Block Party Planning: Proportional Relationships
Additional Activities	Performance Task Enrichment Task	

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), IXL Quiz Lessons 1-3, Sub-Unit Quiz Lessons 1-7, IXL Quiz Lessons 8-10, Lessons Show What You Know
Summative Assessments: End-of-Unit Assessment
Common Benchmark Assessments: Common Cumulative Assessments
Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials
Core Instructional Program: Amplify Desmos Math Online Platform
Desmos Materials by Lesson: • **c**alculators (as needed) (Lessons 1 and 7) • graph paper (Lesson 13) • markers (Lesson 13) • poster paper (Lesson 13) • scientific calculators (as needed) (Lesson 3) • straightedges (Lessons 10, 13)
Math IXL Flex Diagnostic & Practice , Education.com, Delta Math, LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students
Specific Strategies and Practices that Support Students with Disabilities: Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In

addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Specific Strategies and Practices that Support English Language Learners

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments - Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student’s 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning

-Enrichment/Extension Activities within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Unit 3

Desired Results

Unit 3 Title: Measuring Circles

Unit Summary: Students explore the relationships between the radius, diameter, circumference, and area of a circle. Students also practice writing and using equations to calculate missing measurements, which they will revisit in Units 4 and 6.

Sub-Unit 1: Circumference of a Circle (Lessons 1–4 + Practice Day + Quiz)

- Use the relationships between radius, diameter, and circumference to calculate unknown measurements.

Sub-Unit 2: Area of a Circle (Lessons 5–10 + Practice Day + Quiz)

- Calculate the areas of circles and complex shapes composed of fractions of circles.

Learning Standards

NJSLS Math:

7.G Geometry

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

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.

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.

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

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.

Math Practices: MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:
Students will be able to,
Act as a responsible and contributing community members and employee.

Attend to financial well-being in their life and career.
Consider the environmental, social and economic impacts of decisions.
Demonstrate creativity and innovation throughout their life and career.
Utilize critical thinking to make sense of problems and persevere in solving them.
Model integrity, ethical leadership and effective management.
Plan education and career paths aligned to personal goals.
Use technology to enhance productivity, increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).

9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).

9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.

9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Computer Science & Design Thinking (*CS & DT***):**

The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world. Computational thinking is at the heart of the practices and refers to the thought processes involved in expressing solutions as computational steps that can be carried out by a computer. It requires understanding the capabilities of computers, formulating problems addressed by a computer, and designing algorithms that a computer can execute. Curriculum writers and educators will want to consider how they can design learning experiences that will enable their students to develop these skills in conjunction with

the content knowledge reflected in the core ideas and performance expectations. components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form.

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
How do we measure circles when all of our tools are straight? What is π and what does it have to do with circles? How can squares help you measure the space inside circles?	Although our measuring tools are straight, we can measure circles by using consistent relationships between linear dimensions, like diameter and circumference. π (pi) is the constant ratio of a circle's circumference to its diameter, and it helps us calculate both the circumference and the area of circles. We can use squares to estimate and calculate the area of a circle by relating it to a square with a side length equal to the radius, leading to the formula for area: $A = \pi r^2$.

Vocabulary: circumference, diameter, pi, radius

Students will be able to:

1. **Perimeter and Proportional Relationships:** Examine the relationship between the diagonal length and perimeter of a square in preparation to explore analogous relationships in circles. *7.RP.A.2.A 7.RP.A.2.B MP8*
2. **Parts of a Circle:** Study both examples and non-examples of circles and develop language to describe them precisely, including the terms radius and diameter. *7.G.A MP3 MP6*
3. **Estimating and Calculating Circumference:** Explore the relationship between a circle's diameter and circumference. *7.G.B.4 7.RP.A.2.A 7.RP.A.2.B MP5 MP6*
4. **Calculating Perimeters of Complex Shapes:** Apply knowledge of circumference to calculate perimeters of shapes made from squares and parts of circles. *7.G.B.4 MP3 MP6 MP7*
5. **Estimating and Calculating Area:** Surface strategies to determine the area of complex shapes and estimate the areas of shapes with curved edges. *Building Toward: 7.G.B.4 MP3*
6. **Exploring Circle Area:** Use repeated reasoning to make sense of the relationship between radius squares and the area of a circle. *7.G.B MP8*
7. **Calculating Circle Area:** Discover a formula for the relationship between the radius and area of a circle.
8. **Relating Area to Circumference:** Use the relationship between circumference and area to derive the formula for the area of a circle. 7.G.B.4 7.RP.A.2.A MP3 MP6 MP7
9. **Calculating Areas of Complex Shapes:** Apply the area formula to solve problems involving the area of circles as well as shapes composed of parts of circles and squares. *7.G.B.4 MP7*
10. **Calculating Area Given Perimeter:** Apply knowledge of circumference and area to make sense of a challenge involving calculating the areas of two shapes based on their perimeters. *7.G.B.4 MP1 MP8*

Learning Activities: *Suggested or Potential Learning Activities*

Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons. The following activities will be used to supplement learning:

- Math IXL Skill Practice and Group Jams based on each lesson. IXL Learning engages students in an authentic way, encouraging them to own their learning, embrace new challenges, and build skills and confidence that last. The program offers personalized skills recommendations based on what each

student has been practicing and what they are ready to learn next.

- Education.com practice based on each lesson. Education.com worksheets provide students with extra practice to reinforce key concepts and strengthen their skills. By offering a variety of exercises tailored to different learning levels, these worksheets help students build confidence, improve retention, and master challenging topics through consistent, hands-on practice.
- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students.

Students will work in Math IXL and DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Amplify Desmos Lesson 1 "Toothpicks" - Perimeter and Proportional Relationships

Day 2: Amplify Desmos Lesson 2 "Is It a Circle" - Parts of a Circle

Day 3: Practice Day: Activities are included in the table below*.

Day 4: Amplify Desmos Lesson 3 "Measuring Around" - Estimating and Calculating Circumference

Day 5: Amplify Desmos Lesson 4 "Perimeter Challenges" - Calculating Perimeters of Complex Shapes

Day 6: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–4. Consider using this time to prepare for the upcoming quiz.

Day 7: Amplify Desmos Lesson 1-4 Sub-Unit Quiz

Day 8: Amplify Desmos Lesson 5 (Optional) "Area Strategies" - Estimating and Calculating Area

Day 9: Amplify Desmos Lesson 6 "Radius Squares" - Exploring Circle Area

Day 10: Practice Day: Activities are included in the table below*.

Day 11: Amplify Desmos Lesson 7 "Circle Area" - Calculating Circle Area

Day 12: Amplify Desmos Lesson 8 "Why Pi?" - Relating Area to Circumference

Day 13: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 5-8. Consider using this time to prepare for the upcoming assessment.

Day 14: Amplify Desmos Lesson 5-8 IXL Quiz

Day 15: Amplify Desmos Lesson 9 (Optional) "Area Challenges" - Calculating Areas of Complex Shapes

Day 16: Amplify Desmos Lesson 10 (Optional) "Circle vs. Square" - Calculating Area Given Perimeter

Day 17: Amplify Desmos Practice Day (Test Review): Practice the concepts and skills developed during Lessons 1–10. Consider using this time to prepare for the upcoming assessment.

Day 18: Amplify Desmos 7.3 End of Unit Assessment:

Pacing Considerations

> **Lesson 1:** This lesson supports students in developing their understanding of key ideas about proportional relationships in geometric figures, which will be addressed in more depth in upcoming lessons.

Lesson 4: This lesson supports students in developing fluency calculating the perimeter of shapes. If students show a strong understanding working with circumference of circles in earlier lessons, this lesson may be omitted. If omitted, be sure to discuss calculating the perimeter of shapes that are composed of squares and parts of circles elsewhere in the unit.

Lesson 5 (Optional): The purpose of this lesson is to surface strategies for calculating area from Math 6. This prepares students for estimating the area of circles in the next lesson. This lesson may be omitted as it mostly addresses standards from a prior course.

Lesson 9 (Optional): This lesson supports students in developing fluency calculating the area of shapes composed of squares and parts of circles. This lesson may be omitted as it addresses standards already thoroughly covered elsewhere in the unit.

Lesson 10 (Optional): This lesson supports students in developing fluency calculating area and circumference of shapes through a playful problem-solving challenge. This lesson may be omitted as it addresses standards already thoroughly covered elsewhere in the unit.

Activities for Unit 3: Lesson's 1-10*

IXL Skills for the Lesson	**Delta Math Skills for the Lesson**	**Education.com Resources for the Lesson**
• 2VL-Z13 Part of a Circle • CD9-Z14 Central Angles of Circles • KS7-BB5 Circumference of a Circles • YA8-BB6 Area of Circles	• Circumference (in terms of pi) • Circumference (rounding) • Circumference (Level 2) • Perimeter of Irregular Shapes • Area of a Circle (in terms of pi) • Area of a Circle (rounded)	• Circle Vocabulary Crossword Puzzle • Circumference of Circles • Finding the Circumference of Circles • Area of Circles

• P56-BB7 Word Problems with Circles • 2NM-BB8 Area of Semicircles and Quarter Circles • SMW-BB9 Semicircles: Calculating area, perimeter and radius • WK8-BB10 Quarter Circles: Calculating area, perimeter and radius • SMW-BB9 Semicircles: Calculating area, perimeter and radius • BB14-Area between two shapes. **Pull certain select questions from this skill for POD or Exit Tickets	• Circumference and Area of a Circle • Area of Irregular Shape	• Finding the Area of Circles • Area and Circumference of Circles • Perimeter of Semicircles #1, #2, #3 • Perimeter of Quarter Circles #1, #2 • Area of Semicircles #1, #2, #3 • Area of Quarter Circles #1, #2 • Riley's Renovation: Scale Drawing, Area, and Circumference Performance Task
Additional Activities	Performance Task Extra Practice Area/Circumference More Practice with Area Word Problem Practice Enrichment/Challenge Questions	

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz 1 & 2, Show What You Know

Summative Assessments: End-of-Unit Assessment
Common Benchmark Assessments: Common Cumulative Assessments
Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform
Desmos Materials by Lesson: • calculators (as needed) (Lesson 4) • circular objects (Lesson 3) • coloring tools (Lessons 4–5, 9) • graph paper (optional) (Lesson 6) • measuring tools (Lesson 3) • scissors (Lesson 6) • string (Lesson 3) • tape (Lesson 6)
Math IXL Flex Diagnostic & Practice , Education.com, Delta Math, LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

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

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Specific Strategies and Practices that Support English Language Learners

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

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Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments - Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning
-Enrichment/Extension Activities within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Unit 4

Desired Results

Unit 4 Title: Proportional Relationships and Percentages

Unit Summary: Students apply what they have learned about proportional relationships to solve problems involving percent change and fractional quantities.

Sub-Unit 1: Percentages as Proportional Relationships (Lessons 1–6 + Practice Day + Quiz)

- Solve problems involving percent change using representations, such as tape diagrams, double number lines, tables, and equations.

Sub-Unit 2: Applying Percentages (Lessons 7–10 + Practice Day + Quiz)

- Use proportional reasoning to solve problems in real-world situations involving percent increase and decrease and percent error.
- Interpret situations involving percent change and apply appropriate representations to solve problems.

Sub-Unit 3: Proportional Relationships With Fractions and Decimals (Lessons 11–13 + Practice Day)

- Determine unknown values in proportional relationships involving fractional quantities.
- Convert between fraction and decimal representations.

Learning Standards

NJSLS Math:

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

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."*

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

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

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

2. Apply and extend previous understandings of multiplication and division and of fractions 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.

7.RP Ratios and Proportional Relationships
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 units. *For example, if a person walks*

$\frac{1}{2}$ *mile in each* $\frac{1}{4}$ *hour, compute the unit rate as the complex fraction* $\left(\frac{1}{2}\right)/\left(\frac{1}{4}\right)$ *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.

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* $t = pn$.

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.*

Math Practices: MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

Students will be able to,

Act as a responsible and contributing community members and employee.

Attend to financial well-being in their life and career.

Consider the environmental, social and economic impacts of decisions.

Demonstrate creativity and innovation throughout their life and career.
Utilize critical thinking to make sense of problems and persevere in solving them.
Model integrity, ethical leadership and effective management.
Plan education and career paths aligned to personal goals.
Use technology to enhance productivity, increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).

9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).

9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.

9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Computer Science & Design Thinking *(CS & DT)*:

The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world. Computational thinking is at the heart of the practices and refers to the thought processes involved in expressing solutions as computational steps that can be carried out by a computer. It requires understanding the capabilities of computers, formulating problems addressed by a computer, and designing algorithms that a computer can execute. Curriculum writers and educators will want to consider how they can design learning experiences that will enable their students to develop these skills in conjunction with the content knowledge reflected in the core ideas and performance expectations. components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form.

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
How are percentages and fractions related to proportional relationships? How do proportional relationships and percentages represent change in the real world?	Percentages and fractions are both ways to express proportional relationships, showing parts of a whole and helping compare quantities in a consistent way. Proportional relationships and percentages are useful for representing and analyzing real-world changes, such as increases, decreases, discounts, and interest, by comparing the size of the change to the original amount.

Vocabulary: percent decrease, percent error, percent increase, repeating decimal, terminating decimal

Students will be able to:

1. **Working With Fractions and Percentages*:** Create mosaics and determine what percentage of each mosaic is shaded different colors. *Building Toward: 7.RP.A.3 MP6*

2. **Percent Increase and Decrease With Tape Diagrams:** Use both tape diagrams and tables to represent percent increase and percent decrease, and then use these representations to solve problems. *7.RP.A.2 7.RP.A.3 MP2*
3. Percent Increase and Decrease With Equations: Write and use equations to describe the relationship between original and new amounts after a percent increase or decrease. *7.EE.A.2 7.EE.B.4 7.RP.A.3 MP1*
4. **Percent Increase and Decrease With Double Number Lines:** Expand on understanding of double number line diagrams and percentages to model and make sense of problems involving percent change. *7.RP.A.3 MP1*
5. **Calculating Unknowns With Percentages:** Make connections between the representations of double number line diagrams, tables, and equations. *7.RP.A.3 MP3*
6. **Real-World Situations Involving Percent:** Increase Analyze and think critically about what it means for prices and minimum wage to increase by dramatically different percentages. *7.RP.A.3 MP1 MP3*
7. **Multistep Percent Problems:** Solve multistep percent problems in a common context and calculate the total after two percentages are applied. *7.EE.A.2 7.EE.B.4 7.RP.A.3 MP3 MP8*
8. **More Real-World Situations Involving Percent Increase:** Analyze and discuss advantages and disadvantages of different payment systems for restaurant workers. *7.RP.A.2 7.RP.A.3 MP1 MP4*
9. **Percent Error:** Consider why percent error is useful, determine percent error, and decide whether a measurement is within an acceptable range. *7.RP.A.3 MP3 MP8*
10. **Posing Problems Involving Percents:** Ask and answer questions about the world by applying knowledge of increasing and decreasing percentages. *7.RP.A.3 MP5 MP6*
11. **Revisiting Proportional Relationships:** Use tools, such as tables, constants of proportionality, and scale factors to determine unknown values in proportional relationships, some of which involve fractional quantities. *7.RP.A.1 7.RP.A.2 MP5*
12. **Ratios and Rates With Fractions:** Use constants of proportionality to compare proportional relationships involving fractional quantities. *7.RP.A.1 MP3*
13. **Writing Fractions as Decimals:** Convert fractions to decimals using long division and recognize patterns in the calculations for classifying decimals as terminating or repeating. *7.NS.A.2.D MP8*

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

**Optional Lesson*

Learning Activities: *Suggested or Potential Learning Activities*

Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons. The following activities will be used to supplement learning:

- Math IXL Skill Practice and Group Jams based on each lesson. IXL Learning engages students in an authentic way, encouraging them to own their learning, embrace new challenges, and build skills and confidence that last. The program offers personalized skills recommendations based on what each student has been practicing and what they are ready to learn next.
- Education.com practice based on each lesson. Education.com worksheets provide students with extra practice to reinforce key concepts and strengthen their skills. By offering a variety of exercises tailored to different learning levels, these worksheets help students build confidence, improve retention, and master challenging topics through consistent, hands-on practice.
- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students.

Students will work in Math IXL and DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Amplify Desmos Lesson 1 "Mosaics (Optional)" - Working With Fractions and Percentages

Day 2: Amplify Desmos Lesson 2 "More and Less" - Percent Increase and Decrease with Tape Diagrams

Day 3: Practice Day: Activities are included in the table below*.

Day 4: Amplify Desmos Lesson 3 "All the Equations" - Percent Increase and Decrease with Equations

Day 5: Amplify Desmos Lesson 4 "100%" - Percent Increase and Decrease with Double Number Lines

Day 6: Practice Day: Activities are included in the table below*.

Day 7: Amplify Desmos Lesson 5 "Percent Machines" - Calculating Unknowns With Percentages

Day 8: Amplify Desmos Lesson 6 "Back in My Day" - Real-World Situations Involving Percent Increase

Day 9: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–6. Consider using this time to prepare for the upcoming quiz.

Day 10: Amplify Desmos Lesson 1-6 Sub-Unit Quiz

Day 11: Amplify Desmos Lesson 7 "Tax and Tip" - Multi-Step Percent Problems

Day 12: Amplify Desmos Lesson 8 "Plate Rate" - More Real-World Situations Involving Percent Increase

Day 13: Practice Day: Activities are included in the table below*.

Day 14: Amplify Desmos Lesson 9 "Bookcase Builder" - Percent Error

Day 15: Amplify Desmos Lesson 10 "Population and Pollution" - Posing Problems Involving Percents

Day 16: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 7-10. Consider using this time to prepare for the upcoming quiz.

Day 17: Amplify Desmos Lesson 7-10 IXL Quiz

Day 18: Amplify Desmos Lesson 11 "Sticker Sizes" - Revisiting Proportional Relationships

Day 19: Amplify Desmos Lesson 12 "Peach Cobbler" - Ratios and Rates with Fractions

Day 20: Amplify Desmos Lesson 13 "Decimal Deep Dive" - Writing Fractions as Decimals

Day 21: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–13. Consider using this time to prepare for the upcoming assessment.

Day 22: Amplify Desmos 7.4 End of Unit Assessment:

Pacing Considerations

Lesson 1 (Optional): This lesson supports students in surfacing what they know about relationships between percents and fractions. This sets them up for success as they explore percent increase and decrease in the unit. If students show a strong understanding of working with percentages in Problems 3–5 of the Pre-Unit Check, this lesson may be omitted.

Lessons 7–8: These lessons give students an opportunity to use what they've learned about proportional relationships and percent change to analyze issues in our society. If students show a strong understanding

of working with percent change in earlier lessons in the unit, one of these lessons may be omitted. If omitted, be sure to discuss how percent change can empower us to better understand our society throughout the unit.

Lesson 10: This lesson gives students an opportunity to apply what they have learned about percent increase and decrease in this unit to make sense of an issue in society. There is no new math content introduced in this lesson.

Activities for Unit 4: Lesson's 1-13*

IXL Skills for the Lesson	**Delta Math Skills for the Lesson**	**Education.com Resources for the Lesson**
• D7D-01 What Percentage is Illustrated • 2HW-02 Convert Between Percents, Fractions and Decimals • JAE-03 Compare Percents to Fractions and Decimals • 29D-04 Estimate Percents of Numbers • 9XC-05 Solve Percent Problems using Strip Models • 93K-06 Percent Numbers and Money Amounts • EXE-07 Percent of Numbers Word Problems	• Which is more? (Percent Comparison) • Percent of Whole Word Problems L1 • Percent More or Less Multiplier (Level 1) • Percent More or Less Word Problems • Find Percent Increase/Decrease • Percent More or Less (Formula) L1 • Percent Change Word Problems (L3) • Expressions Percent More or Less (L1)	• Percent of Change Word Problems • Percent Word Problems • Markup and Markdown Word Problems • Simple Interest Word Problems • Calculate Unit Rates With Fractions • Unit Rates With Fractions • Matching Unit Rates with Fractions #1, #2, #3 • Writing Rational Numbers as Decimals • Block Party Planning: Proportional Relationship

• 67F-O8 Solve Percent Equations • JS6-O9 Solve Percent Equations; Word Problems • BL7-O10 Percent Change • 54S-O11 Percent Change Word Problems • RCM-O12 Percent of Change: Find the Original Amount Word Problems • 6UY-O13 Percent Error *** This IXL skill order does not align with Desmos order so teachers will have to assign skills aligned with the particular lesson they are on, recently completed and or want to revisit.	• Multistep Percent More or Less (Level 1) • Percent Increase / Decrease Expressions • Percent Error • Relative Error (1D)	Performance Task
Additional Activities	Performance Task Extra Practice Fractions/Dec/ Percents More Practice Converting between Fra/Dec/Percents Percent of a Quantity Practice Real World Problems Practice Percent Change Practice Enrichment/ Challenge Questions	

Climate Change Activity:

Activity Title: Fair Pay, Sustainable Practices: Analyzing Restaurant Payment Systems and Climate Impact

Objective: Students will analyze different restaurant payment systems (e.g., hourly wage, tipped minimum wage, service charges) and discuss

their potential environmental and social sustainability advantages and disadvantages, particularly related to climate change impacts.

Materials:

- *Computer/internet access for research*
- *Whiteboard or chart paper*
- *Markers*
- *Case studies of different restaurants using different payment systems (can be real or hypothetical)*
- *Information on the environmental impacts of the restaurant industry (e.g., energy consumption, food waste, supply chains)*
- *Information on the social impacts of different payment systems (e.g., worker wages, job security, workplace culture)*

Procedure:

1. *Introduction (15 minutes):*
    1. *Begin by introducing the concept of sustainability in the restaurant industry, highlighting both environmental and social aspects.*
    2. *Discuss how business practices can impact both the environment and the people who work in them.*
    3. *Briefly review the standard: "Analyze and discuss advantages and disadvantages of different payment systems for restaurant workers".*
2. *Exploring Payment Systems (30 minutes):*
    1. *Divide students into small groups.*
    2. *Assign each group a different restaurant payment system to research:*
        1. *Hourly wage (with or without tips)*
        2. *Tipped minimum wage*

3. *Service charges*
4. *Other potential systems (e.g., revenue sharing)*

3. *Guide groups to research the advantages and disadvantages of each system, focusing on its potential impact on:*
    1. *Worker income and job security*
    2. *Restaurant operational costs*
    3. *Customer experience*

3. *Connecting to Climate Change (45 minutes):*
    1. *Bring the groups back together.*
    2. *Facilitate a class discussion about how different payment systems can intersect with climate change:*
        1. *Transportation: Consider how payment structures might impact commuting distances or incentivize the use of public transportation.*
        2. *Energy Consumption: Discuss how higher wages could allow workers to afford more energy-efficient homes or vehicles.*
        3. *Food Sourcing: Explore how different payment systems might influence a restaurant's ability to invest in sustainable sourcing or partnerships with local farms.*
        4. *Worker Wellbeing and Heat Stress: Analyze how adequate compensation and workplace safety measures can mitigate the risks of climate change-related heat exposure in kitchens.*
    3. *Encourage students to consider the systemic impacts of different payment models.*

4. *Case Study Analysis (45 minutes):*
    1. *Provide students with case studies of restaurants that have implemented different payment systems and potentially integrated sustainable practices.*
    2. *Students analyze the case studies, focusing on the successes and challenges related to both the payment system and the sustainability initiatives.*
    3. *Have students present their findings and discuss the trade-offs and synergies observed in the case studies.*

5. *Conclusion (15 minutes):*
    1. *Summarize the key findings from the discussions and case studies.*
    2. *Reiterate the connection between restaurant payment systems, worker well-being, and climate change.*
    3. *Discuss potential policy implications and the role of consumers in promoting ethical and sustainable restaurant practices.*

Extension Activities:

- *Have students design their own sustainable restaurant payment system, considering its potential impacts on workers, the environment, and the business's bottom line.*
- *Students can research and present on local restaurants that have adopted innovative sustainability or payment models.*

This activity allows students to critically analyze the complexities of restaurant payment systems and their connection to broader sustainability issues, including the urgent challenge of climate change.

Assessment Evidence
Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz 1 & 2, Show What You Know
Summative Assessments: End-of-Unit Assessment
Common Benchmark Assessments: Common Cumulative Assessments

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • calculators (Lessons 3, 6–8, 10–11) • coloring tools, three different colors (Lessons 1, 10) • graph paper (optional) (Lesson 13) • scientific calculators (as needed) (Lessons 1, 5) • poster paper (Lesson 10)

Math IXL Flex Diagnostic & Practice , Education.com, Delta Math, LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

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

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Specific Strategies and Practices that Support English Language Learners

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups
Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice
Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments - Opportunities
for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning
-Enrichment/Extension Activities within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Unit 5

Desired Results

Unit 5 Title: Operations With Positive and Negative Numbers

Unit Summary: Students extend what they learned in Grade 6 to add, subtract, multiply, and divide positive and negative numbers.

Sub-Unit 1: Adding and Subtracting (Lessons 1–5 + Practice Day + Quiz)

- Add and subtract positive and negative numbers using a variety of strategies.
- Describe strategies for determining the sum or difference of two rational numbers.

Sub-Unit 2: Multiplying and Dividing (Lessons 6–10 + Practice Day + Quiz)

- Perform all four operations with positive and negative numbers using a variety of strategies.
- Describe strategies for determining the sum, difference, product, or quotient of two rational numbers.

Sub-Unit 3: Applying Operations (Lessons 11–13 + Practice Day)

- Apply all four operations with positive and negative numbers to analyze changes in our environment.
- Interpret information about real-world situations involving positive and negative numbers.

Learning Standards

NJSLS Math:

7.EE Expressions and Equations

B. Solve real-life and 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*

$\frac{1}{10}$ *of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *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.*

7.NS The Number System

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. *For example, in the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?*

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 $-\left(\frac{p}{q}\right) = \frac{(-p)}{q} = \frac{p}{(-q)}$. Interpret quotients of rational numbers by describing real world contexts.

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

3. Solve real-world and mathematical problems involving the four operations with rational numbers. *(Clarification: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)*

Math Practices: MP1, MP2, MP3, MP4, MP5, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)***:**

Students will be able to,

Act as a responsible and contributing community members and employee.
Attend to financial well-being in their life and career.
Consider the environmental, social and economic impacts of decisions.
Demonstrate creativity and innovation throughout their life and career.
Utilize critical thinking to make sense of problems and persevere in solving them.
Model integrity, ethical leadership and effective management.
Plan education and career paths aligned to personal goals.
Use technology to enhance productivity, increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).

9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).

9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.

9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Computer Science & Design Thinking (*CS & DT***):**

The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world. Computational thinking is at the heart of the practices and refers to the thought processes involved in expressing solutions as computational steps that can be carried out by a

computer. It requires understanding the capabilities of computers, formulating problems addressed by a computer, and designing algorithms that a computer can execute. Curriculum writers and educators will want to consider how they can design learning experiences that will enable their students to develop these skills in conjunction with the content knowledge reflected in the core ideas and performance expectations. components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form.

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
How do you represent addition, subtraction, multiplication, or division of numbers on a number line? How is solving problems with fractions or decimals the same or different from solving problems with only whole numbers? How can positive and negative numbers be used to represent real world situations?	The number line is a useful tool for representing addition, subtraction, multiplication, and division by showing the distance and direction between numbers. Solving problems with fractions and decimals follows the same mathematical principles as with whole numbers, but it often requires more careful attention to place value, equivalent forms, and precision. Positive and negative numbers are used to represent quantities in real-world situations that have direction or context, such as temperature changes, financial

	gains and losses, or elevation above and below sea level.
Vocabulary: integer, number line, positive, negative, position, rate, time	
Students will be able to: 1. **Representing Adding and Subtracting:** Develop a model for adding and subtracting positive and negative numbers. *7.NS.A.1 7.NS.A.1.A MP2 MP8* 2. **Adding and Subtracting Positive and Negative Numbers:** Use floats and anchors to reason about adding and subtracting positive and negative numbers. *7.NS.A.1 7.NS.A.1.C MP7* 3. **Adding on the Number Line:** Add and subtract positive and negative decimals and fractions on a number line. *7.NS.A.1.B 7.NS.A.1.D MP5 MP8* 4. **Number Lines and Expressions:** Reason about representing subtraction of positive and negative numbers on a number line. *7.NS.A.1 7.NS.A.1.B 7.NS.A.1.C 7.NS.A.1.D MP3 MP7* 5. **Practice with Adding and Subtracting:** Reason about the signs and values of expressions. *7.EE.B.3 7.NS.A.1 7.NS.A.1.C 7.NS.A.1.D MP1* 6. **Representing Multiplication:** Extend the floats and anchors model to make sense of multiplying positive and negative integers. *7.NS.A.2 MP2* 7. **Position, Rate, and Time:** Make sense of a different model for multiplying positive and negative numbers involving position, rate, and time. *7.NS.A.2 7.NS.A.2.A MP1* 8. **Dividing Integers:** Make sense of division of positive and negative numbers using position, rate, and time. *7.NS.A.2.B 7.NS.A.2.C MP2* 9. **Variable Expressions:** Reason about variable expressions with positive and negative numbers involving adding, subtracting, multiplying, and dividing. *7.NS.A.1 7.NS.A.1.D 7.NS.A.2 7.NS.A.2.C MP3 MP7* 10. **Practice With All Four Operations:** Reason about the signs and values of expressions that include all four operations with positive and negative numbers. *7.EE.B.3 7.NS.A.1.D 7.NS.A.2.A 7.NS.A.2.C MP1 MP3*	

11. **Real-World Situations Involving Positive and Negative Numbers, Part 1:** Apply knowledge of addition and subtraction of positive and negative numbers to make sense of changing temperatures around the world and changing sea ice. *7.EE.B.3 7.NS.A.3 MP1*
12. **Real-World Situations Involving Positive and Negative Numbers, Part 2:** Model changes on Arctic sea ice and in rising sea levels and make predictions about the future using positive and negative rates. *7.EE.B.3 7.NS.A.3 MP4*
13. **Real-World Situations Involving Positive and Negative Numbers, Part 3:** Make sense of how solar panels can affect carbon emissions and electricity costs by using operations with positive and negative numbers. *7.EE.B.3 7.NS.A.2.A 7.NS.A.3 MP3 MP4*

14. **7.NS.B.3 Solve real-world and mathematical problems involving the four operations** with rational numbers. (Clarification: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.).

Learning Activities: *Suggested or Potential Learning Activities*

Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons. The following activities will be used to supplement learning:

- Math IXL Skill Practice and Group Jams based on each lesson. IXL Learning engages students in an authentic way, encouraging them to own their learning, embrace new challenges, and build skills and confidence that last. The program offers personalized skills recommendations based on what each student has been practicing and what they are ready to learn next.
- Education.com practice based on each lesson. Education.com worksheets provide students with extra practice to reinforce key concepts and strengthen their skills. By offering a variety of exercises tailored to different learning levels, these worksheets help students build confidence, improve retention, and master challenging topics through consistent, hands-on practice.
- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of

all students.

Students will work in Math IXL and DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Amplify Desmos Lesson 1 "Floats and Anchors" - Representing Adding and Subtracting

Day 2: Amplify Desmos Lesson 2 "More Floats and Anchors" - Adding and Subtracting Positive and Negative Numbers

Day 3: Practice Day: Activities are included in the table below*.

Day 4: Amplify Desmos Lesson 3 "Bumpers" - Adding on the Number Line

Day 5: Amplify Desmos Lesson 4 "Draw Your Own" - Number Lines and Expressions

Day 6: Practice Day: Activities are included in the table below*.

Day 7: Amplify Desmos Lesson 5 "Number Puzzles" - Practice with Adding and Subtracting

Day 8: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–5. Consider using this time to prepare for the upcoming quiz.

Day 9: Amplify Desmos Lesson 1-5 Sub-Unit Quiz

Day 10: Amplify Desmos Lesson 6 "Floating in Groups" - Representing Multiplication

Day 11: Amplify Desmos Lesson 7 "Back in Time" - Position, Rate, and Time

Day 12: Practice Day: Activities are included in the table below*.

Day 13: Amplify Desmos Lesson 8 "Speeding Turtles" - Dividing Integers

Day 14: Amplify Desmos Lesson 9 "Expressions" - Variable Expressions

Day 15: Practice Day: Activities are included in the table below*.

Day 16: Amplify Desmos Lesson 10 "Integer Puzzles" - Practice with All Four Operations

Day 17: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 6-10. Consider using this time to prepare for the upcoming assessment.

Day 18: Amplify Desmos Lesson 6-10 Sub-Unit Quiz

Day 17: Amplify Desmos Lesson 11 "Temperatures Around the World" - Real-World Situations Involving Positive and Negative Numbers, Part 1

Day 18: Amplify Desmos Lesson 12 "Visiting the Arctic" - Real-World Situations Involving Positive and Negative Numbers, Part 2

Day 19: Amplify Desmos Lesson 13 "Solar Panels and More" - Real-World Situations Involving Positive and Negative Numbers, Part 3

Day 20: Amplify Desmos Practice Day (Test Review): Practice the concepts and skills developed during Lessons 1-13. Consider using this time to prepare for the upcoming assessment.

Day 21: Amplify Desmos 7.5 End of Unit Assessment:

Pacing Considerations

Lesson 5: This lesson supports students in developing fluency in reasoning about the signs and values of expressions that include adding and subtracting with positive and negative numbers. If students show a strong understanding working with adding and subtracting positive and negative numbers in earlier lessons, this lesson may be omitted.

Lesson 10: This lesson supports students in developing fluency in reasoning about the signs and values of expressions that include all four operations with positive and negative numbers. If students show a strong understanding of this content in earlier lessons, this lesson may be omitted.

Lessons 11–13: These lessons give students an opportunity to apply what they've learned about all four operations involving positive and negative numbers to better understand our environment. There is no new content in these lessons, so one or two of these lessons may be omitted. If omitted, be sure to discuss how operations using positive and negative numbers can empower us to better understand our environment.

Activities for Unit 5: Lesson's 1-13*

IXL Skills for the Lesson	**Delta Math Skills for the Lesson**	**Education.com Resources for the Lesson**
• YBC-A1 Understanding Integers • A5Y-A2 Integers on a Number Line • EM8-A3 Graph Integers on a Horizontal and Vertical Number Line	• Adding Integers on a Number Line (L1) • Plot and Find Distance (Integers on Number Line) • Subtraction of Integers (Distance	• Adding Integers Using Number Lines • Add Integers Using Number Lines #1, #2 • Integer Addition Rules

• 6PJ-A4 Understanding Absolute Value • N5B-A5 Absolute Value and Opposite Integers • JX8-A7 Compare and Order Integers • BTT-A8 Integer Inequalities and Absolute Values • ERH-B3 Integer Addition Rules • QFU-B4 Add Integers • PBC-B5 Add three or more Integers • QZA-B8 Integer Subtraction Rules • HEU-B9 Subtract Integers • 6EV-B10 Integer Addition and Subtraction Rules • FNS-B12 Add and Subtract Integers • P6A-B13 Complete Addition and Subtraction Equations with Integers • 2DD-B14 Add and Subtract Integer Word Problems • K7U-B16 Integer Multiplication Rules • DQT-B17 Multiply Integers • TQ9-B18 Integer Division Rules • 2QY-B19 Equal Quotient of Integers	on Number Line) • Subtraction of Signed Decimals (Distance on Number Line) • Subtraction as Adding the Opposite (Rewrite) • Subtraction as Adding the Opposite (L1) • Integer Multiplication in Context (– x +, – x –), Guided • Integer Multiplication in Context (+ x +, + x –), Guided • Multiplication/Division of Integers L1 • PEMDAS (Integers no Exponent) • PEMDAS (Integers with Exponents) • Evaluate Absolute Value Expressions L1 • Operations with Integers • Operations with Decimals (Positive and Negative)	• Adding Integers • Integer Addition: Missing Numbers in Equations #1, #2, #3 • Integer Addition: Matching Sums • Subtracting Integers Using Number Lines • Subtracting Integers Using Number Lines #1, #2 • Integer Subtraction Rules • Subtracting Integers • Integer Subtraction: Missing Numbers in Equations #1, #2, #3 • Integer Subtraction: Matching Differences • Add and Subtract Integers • Add and Subtract Integers: Word Problems • Adding and Subtracting Positive and Negative Fractions • Adding and Subtracting Positive and Negative Fractions and Mixed Numbers • Adding and Subtracting Rational Numbers • Subtracting Positive and Negative Decimals #1 • Multiplying Integers • Integer Multiplication: Matching Products • Integer Multiplication: Missing

• CTV- B20 Divide Integers • 5R8-B21 Integer Multiplication and DIvision Rules • R8D-B22 Multiply and Divide Integers • K94-B23 Complete Multiplication and Division Equations with Integers • B8A-B24 Add, Subtract, Multiply and Divide Integers • 7YN-B25 Evaluate Numerical Expression Involving Integers		Numbers in Equations #1, #2, #3 • Dividing Integers • Integer Division: Matching Quotients • Integer Division: Missing Numbers in Equations #1, #2, #3 • Multiply and Divide Integers • Integer Multiplication and Division: Matching • Multiply and Divide Rational Numbers • Multiplying and Dividing Positive and Negative Fractions • Multiplying and Dividing Positive and Negative Fractions and Mixed Numbers • Integer Operations #1, #2, #3 • Mixed Integer Operation Maze • Integer Operations: Matching • Integer Operations: Missing Numbers in Equations #1, #2, #3 • Rational Number Operations #1, #2, #3
Additional Activities	Performance Task Adding Integers Subtracting Integers Multiplying & Dividing Integers More Operations with Integers	

	Operations with Rational Numbers Operations with Decimals Enrichment

***NS.B.3 Climate Change Activity**

Lesson Plan Title:
"Data & Decisions: Understanding Climate Change through Math"

Grade Level:
7th Grade

CCSS Standard:
7.NS.B.3 – Solve real-world and mathematical problems involving the four operations with rational numbers.

Lesson Duration:
2 class periods (45 minutes each)

Lesson Objectives:
By the end of the lesson, students will be able to:

- Use rational numbers to analyze and interpret real climate data.
- Solve multi-step problems involving positive and negative rational numbers (including temperature changes, sea level rise, CO_2 concentrations).
- Explain how mathematical data supports understanding of climate change.

Materials Needed:

- Student worksheets (climate data tables)
- Graph paper or digital graphing tools
- Calculator
- Access to NOAA or NASA climate data (optional)

- Projector or whiteboard

Lesson Outline:
Day 1: Introduction to Climate Change Data

Warm-Up (5 min):
Quick review of rational numbers (positive, negative, decimals, fractions).

Hook (5 min):
Show a short video (1–2 minutes) on climate change trends (e.g., rising global temperatures).

Mini-Lesson (10 min):
Discuss examples of real-world data showing:
- Global temperature change over 100 years
- CO_2 concentration levels
- Sea level rise
- Highlight use of positive and negative numbers in tracking changes (e.g., temperature anomaly = +1.2°C).

Guided Practice (20 min):
Students receive a data table (e.g., yearly global temperature anomalies from 1900–2020).
Tasks:
- Find the difference in temperature between decades.
- Calculate the average temperature change per decade.
- Identify increases and decreases using signed numbers.

Exit Ticket (5 min):
One multi-step word problem involving calculating average annual change in temperature or CO_2 levels.

Day 2: Applying Math to Climate Problem Solving

Review (5 min):

Discuss yesterday's findings.

Group Activity (25 min):
In pairs or small groups, students solve a set of real-world problems using climate data. Examples:

- Calculate the rate of sea level rise over 30 years.
- Determine how much CO_2 emissions increased from 1960 to 2020.
- Create a number line showing temperature changes over time.

Graphing Task (10 min):
Students graph one dataset (e.g., temperature anomaly by decade).

Wrap-Up Discussion (5 min):
Reflect on how math helps us understand and explain climate change.
Prompt: "What does the data tell us about how the planet is changing?"

Assessment:
- Observation of group work and discussion
- Completed worksheet with rational number operations
- Accuracy of graph and calculations

Exit ticket performance

Extension (Optional):
Students write a short paragraph:
"Based on the data, what is one action you think society should take to address climate change?"

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz 1, Sub-Unit Quiz 2, Show What You Know

Summative Assessments: End-of-Unit Assessment

Common Benchmark Assessments: Common Cumulative Assessments

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • calculators (as needed) (Lessons 11–13) • coloring tools (as needed) (Lesson 9)

Math IXL Flex Diagnostic & Practice , Education.com, Delta Math, LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:
Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In

addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

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Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments - Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student’s 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

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-Enrichment/Extension Activities within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Unit 6

Desired Results

Unit 6 Title: Expressions, Equations, and Inequalities

Unit Summary: In this unit, students extend what they learned in Grade 6 about solving one-step equations to solve equations of the form px+q=r and p(x+q)=r, as well as equations that include expanding, factoring, or adding terms. Students also solve inequalities and graph their solutions on a number line.

Sub-Unit 1: Equations and Tape Diagrams (Lessons 1–4 + Practice Day + Quiz)

- Use tape diagrams to represent equations and situations in context and to determine unknown values.

Sub-Unit 2: Solving Equations (Lessons 5–12 + Practice Day + 2 Quizzes)

- Solve equations of the form px+q=r and p(x+q)=r in real-world and mathematical problems.
- Write equivalent expressions by adding, subtracting, expanding, and factoring.

Sub-Unit 3: Inequalities (Lessons 13–17 + Practice Day)

- Solve inequalities of the form px+q>r and px+q<r that represent real-world and mathematical problems.
- Create graphs that represent solutions to inequalities, including those with $\leq$ or $\geq$.

Learning Standards

NJSLS Math:

7.EE Expressions and Equations

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."*

B. Solve real-life and 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*

$\frac{1}{10}$ *of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *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 with accuracy and efficiency. 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.*

Math Practices: MP1, MP2, MP3, MP5, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

Students will be able to,
Act as a responsible and contributing community members and employee.
Attend to financial well-being in their life and career.
Consider the environmental, social and economic impacts of decisions.
Demonstrate creativity and innovation throughout their life and career.
Utilize critical thinking to make sense of problems and persevere in solving them.
Model integrity, ethical leadership and effective management.
Plan education and career paths aligned to personal goals.
Use technology to enhance productivity, increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).

9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).

9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.

9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Computer Science & Design Thinking (*CS & DT***):**

The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world. Computational thinking is at the heart of the practices and refers to the thought processes involved in expressing solutions as computational steps that can be carried out by a computer. It requires understanding the capabilities of computers, formulating problems addressed by a computer, and designing algorithms that a computer can execute. Curriculum writers and educators will want to consider how they can design learning experiences that will enable their students to develop these skills in conjunction with the content knowledge reflected in the core ideas and performance expectations. components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form.

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
Which representations help you make sense of different mathematical situations?	Different representations—such as tables, graphs, number lines, equations, and diagrams—help us

Which strategies for solving simple equations or inequalities can help you solve more complex ones? What are ways to increase efficiency when solving mathematical problems?	understand and solve mathematical situations by making relationships and patterns more visible. Strategies used to solve simple equations and inequalities, such as using inverse operations and maintaining balance, build a foundation for solving more complex problems. Recognizing patterns, choosing appropriate strategies, and using efficient tools or representations can make solving mathematical problems quicker and more accurate.
Vocabulary: expand, factor, equivalent expressions, greater-than-or-equal-to, less-than-or-equal-to, solutions to an inequality	
Students will be able to: 1. **Determining Unknowns in Patterns*:** Make predictions and determine unknown values in the relationship between the stage number of a design and the number of toothpicks and tiles that border it. *Building Toward 7.EE.B Building Toward 7.EE.B.4.A MP3 MP8* 2. **Connecting Contexts and Tape Diagrams:** Revisit tape diagrams and surface strategies for using them to determine unknown values in situations. *7.EE.B.3 MP1 MP2 MP3* 3. **Representing Contexts With Tape Diagrams and Equations:** Use knowledge about tape diagrams and situations to make sense of equations of non-proportional relationships. *7.EE.B.3 7.EE.B.4 MP1 MP2* 4. **Practice With Tape Diagrams and Equations:** Use structure to analyze and solve a question in context and interpret the meaning of its solution. *7.EE.B.3 7.EE.B.4 MP2 MP5 MP7*	

5. **Introduction to Balanced Hangers:** Develop strategies for determining an unknown weight by creating balanced hangers with fewer objects. *7.EE.B.3 MP3 MP6*
6. **Solving Equations With Balanced Hangers:** Understand strategies for solving an equation and connect those to balanced moves on a hanger. *7.EE.B.4.A MP3*
7. **Solving Equations:** Describe and use strategies for solving equations of the forms px + q = r or p(x + q) = r that involve positive and negative numbers. *7.EE.B.4.A MP7*
8. **Options for Solving One Equation:** Rewrite expressions by factoring and expanding, and then solve equations in multiple ways and compare the results. *7.EE.A.1 7.EE.A.2 7.EE.B.4.A MP3 MP7 MP8*
9. **Equivalent Expressions:** Understand that equivalent expressions have the same value for any value of the variable. *7.EE.A.1 MP3 MP6*
10. **Adding Expressions:** Write expressions with fewer terms by adding, subtracting, and expanding terms.
11. **Solving Equations Multiple Ways:** Solve equations using a variety of strategies. *7.EE.A.1 MP7*
12. **Using Equations to Solve Problems:** Represent and answer questions about situations in context. *7.EE.B.3 7.EE.B.4 7.EE.B.4.A MP1 MP2*
13. **Inequalities on the Number Line:** Extend learning about graphing inequalities and use two new symbols, greater-than-or-equal-to (≥) and less-than-or-equal-to (≤) to describe situations. *7.EE.B.4 MP2 MP3 MP6*
14. **Solutions to Inequalities:** Make sense of solving inequalities using hanger diagrams, a familiar representation. *7.EE.B.4 7.EE.B.4.B MP3*
15. **Solving Inequalities in Context:** Write and solve inequalities related to situations about budgeting and spending money. *7.EE.B.4 7.EE.B.4.B MP1 MP3*
16. **Solving Inequalities With Positive and Negative Numbers:** Solve inequalities with both positive and negative coefficients and connect the solutions of inequalities to their graphs. *7.EE.B.4.B MP3*
17. **Modeling With Inequalities:** Write and solve inequalities and critically examine what the solutions to those inequalities mean in context. *7.EE.B.4 7.EE.B.4.B MP2*

18. **EE.B.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.

**Optional Lesson*

Learning Activities: *Suggested or Potential Learning Activities*

Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons. The following activities will be used to supplement learning:

- Math IXL Skill Practice and Group Jams based on each lesson. IXL Learning engages students in an authentic way, encouraging them to own their learning, embrace new challenges, and build skills and confidence that last. The program offers personalized skills recommendations based on what each student has been practicing and what they are ready to learn next.
- Education.com practice based on each lesson. Education.com worksheets provide students with extra practice to reinforce key concepts and strengthen their skills. By offering a variety of exercises tailored to different learning levels, these worksheets help students build confidence, improve retention, and master challenging topics through consistent, hands-on practice.
- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students.

Students will work in Math IXL and DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Amplify Desmos Lesson 1 "Toothpicks and Tiles (Optional)" - Determining Unknowns in Patterns

Day 2: Amplify Desmos Lesson 2 "Smudged Receipts" - Connecting Contexts and Tape Diagrams

Day 3: Practice Day: Activities are included in the table below*.

Day 4: Amplify Desmos Lesson 3 "Equations" - Representing Contexts With Tape Diagrams and Equations

Day 5: Amplify Desmos Lesson 4 "Seeing Structure" - Practice with Tape Diagrams and Equations

Day 6: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–4. Consider using this time to prepare for the upcoming quiz.

Day 7: Amplify Desmos Lesson 1-4 Sub-Unit Quiz

Day 8: Amplify Desmos Lesson 5 "Balancing Moves" - Introduction to Balanced Hangers

Day 9: Amplify Desmos Lesson 6 "Balancing Equations" - Solving Equations With Balanced Hangers

Day 10: Practice Day: Activities are included in the table below*.

Day 11: Amplify Desmos Lesson 7 "Keeping It True" - Solving Equations

Day 12: IXL Lessons 5-7 Quiz

Day 13: Amplify Desmos Lesson 8 "Factoring and Expanding" - Options for Solving One Equation

Day 14: Amplify Desmos Lesson 9 "Always-Equal Machines" - Equivalent Expressions

Day 15: Practice Day: Activities are included in the table below*.

Day 16: Amplify Desmos Lesson 10 "Collect the Squares" - Adding Expressions

Day 17: Amplify Desmos Lesson 11 "Pass the Equation" - Solving Equations Multiple Ways

Day 18: Practice Day: Activities are included in the table below*.

Day 19: Amplify Desmos Lesson 12 "Community Day" - Using Equations to Solve Problems

Day 20: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 8–12. Consider using this time to prepare for the upcoming assessment.

Day 21: Amplify Desmos Lesson 8-12 Sub-Unit Quiz

Day 22: Amplify Desmos Lesson 13 "I Saw the Signs" - Inequalities on the Number Line

Day 23: Amplify Desmos Lesson 14 "Unbalanced Hangers" - Solutions to Inequalities

Day 24: Practice Day: Activities are included in the table below*.

Day 25: Amplify Desmos Lesson 15 "Budgeting" - Solving Inequalities in Context

Day 26: Amplify Desmos Lesson 16 "Shira the Sheep" - Solving Inequalities With Positive and Negative Numbers

Day 27: Practice Day: Activities are included in the table below*.

Day 28: Amplify Desmos Lesson 17 "Write Them and Solve Them" - Modeling With Inequalities

Day 29: Amplify Desmos Practice Day (Test Review): Practice the concepts and skills developed during Lessons 1–17. Consider using this time to prepare for the upcoming assessment.

Day 30: Amplify Desmos 7.6 End of Unit Assessment:

Pacing Considerations

Lesson 1 (Optional): This lesson may be omitted because it surfaces what students know about finding unknowns in proportional and non-proportional relationships, but these ideas will be addressed in more depth in upcoming lessons.
Lessons 2–3: These lessons may be condensed into one lesson if students show a strong understanding of matching tape diagrams with expressions in the Pre-Unit Check.

Activities for Unit 6: Lesson's 1-17*

IXL Skills for the Lesson	**Delta Math Skills for the Lesson**	**Education.com Resources for the Lesson**
• 59k-R1 Write Variable Expressions: One Operation • EGS-R2 Write Variable Expressions Two or Three Operations • XMD-R3 Write Variable Operations Word Problems • UG6-R4 Evaluate Linear Expressions	• Two Step Equations • Two Step Equations with Decimals • Two Step Equations with Fractional Coefficients (L1) • Linear Equations w/ Distribution (Lev 1) • Linear Equations w/ Distribution (Lev 2)	• Solving Two-Step Equations: Level 1, Level 2, Level 3 • Solve Two-Step Equations #1, #2, #3 • Solving Equations with Parentheses • Solve Two-Step Equations Quiz • Two-Step Equations Word Problems

• T56-R5 Write Multi-Variable Expressions • YL5-R6 Evaluate Absolute Value Expressions • ZHY-R7 Evaluate Non-Linear Expressions • E7H-R8 Identify Terms and Coefficients • BUX-R9 Sort Factors and Variable Expressions • JJG S3 Simplifying Expressions by Combining Like Terms • NUY-S5 Multiply Using the Distributive Property • 6BT-S7 Add Subtract Linear Expressions • EQA-S8 Add Subtract Linear Expressions with Exponents • DRB-S12 Identify Equivalent Linear Expressions I • KAR-S13 Identify Equivalent Linear Expressions II • KWH-S14 Identify Equivalent Linear Expressions: Word Problems III • DJS-T1 Which x satisfies the equation? • N2T-T2 Write an Equation from Words • XSC-T3 Solve Equations Using	• Fractional Linear Equations • Value that Makes Equation True (Multiple Choice) • Tape Diagram Model - Linear Equations • Tape Diagram Model - Linear Equations (Multiple Choice) • Tape Diagram Model - Equations with Distributive Property • Tape Diagram Model - Equations with Distributive Property (MC) • Solve Equations in Context (Unwinding) • Equations in Context (MC) • Write and Solve Equations in Context • Values that Make an Inequality True (MC - L2) • Linear Inequality and Number Line (L1) • Solve Inequalities in Context (Unwinding) • Inequalities in Context (MC) • Write and Solve Inequalities in Context	• A Trip With Two-Step Equations • Expanding Linear Expressions using the Distributive Property • Practice Expanding Linear Expressions #1, #2 • Factoring Linear Expressions • Factor Linear Expressions Using Area Models #1, #2, #3 • Factor Linear Expressions in Two Ways #1, #2. #3 • Expanding and Factoring Linear Expressions • Identifying Equivalent Linear Expressions • Writing Equivalent Linear Expressions • Matching Equivalent Expressions • Equivalent Expressions: Matching Activity • Equivalent Expressions: Card Sort • Equivalent Expression Word Problems: Part 1 • Equivalent Expression Word Problems: Part 1 • Equivalent Expression Word Problems: Part 2 • Starting a Skate Team: Writing and Evaluating Expressions • Combining Like-Terms #1, #2, #3

Properties • WKM-T6 Solve One Step Equations • 6KX-* Solve One Step Equations with Decimal and Fractions • CMX-T7 Solve Two Step Equations Without Parenthesis. • NSH-T8 Solve Two Step Equations with Parenthesis. • KEB-T9 Solve Two Step Equations with • 53A-T10- Solve Two Step Equations with Fractions • 8NH-T11 Choose Two Step Equations Word Problems • D2Y-T12 Solve Two Step Equations Word Problems • VSW-T13 Solve Two Step Equations Involving Like Terms • 66R-T14- Solve Two Step Equations: Complete Like Terms • 8BA-U1-Solutions to Inequalities • VLU-U2 Graph Inequalities on a Number Line • JNL-U3 Write Inequalities from Number Lines • QWH-U4 Solve One Step Inequalities • TFK-U5 Graph Solutions to One Step Inequalities		• Add Linear Expressions • Subtract Linear Expressions • Practice Adding Linear Expressions • Practice Subtracting Linear Expressions • Adding and Subtracting Linear Expressions • A Day at the Beach: Identifying and Writing Equivalent Expressions • Solving One-Step Inequalities • Solve One-Step Inequalities #1, #2, #3 • One-Step Inequality Word Problems • Solve Two-Step Inequalities #1, #2, #3 • Two-Step Inequality Word Problems

• 6HD-U6 One Step Inequalities Word Problems • XGQ-U7 Solve Two Step Inequalities • 6TT-U8 Graph Solutions to Two Step Inequalities		
Additional Activities	Performance Task for Expressions Adding Algebraic Terms Practice Subtracting Algebraic Terms Practice Simplifying Algebraic Terms Practice Expanding Algebraic Terms Practice Factoring Algebraic Terms Practice Writing Algebraic Expressions Practice Real World Algebraic Reasoning Practice Performance Task for Equations & Inequalities Understanding Equivalent Equations Practice Solving Algebraic Equations Practice Real World Algebraic Equation Practice Problems Solving Algebraic Inequalities Practice Equations and Inequalities Enrichment	

***EE.B.3 Climate Change Activity:**

Lesson Title: "Carbon Footprints and Climate Change Math"
Grade Level: 7th Grade
Standards Addressed: 7.EE.B.3
Duration: 1 class period (45–60 minutes)

Objective:
Students will use positive and negative rational numbers (fractions, decimals, whole numbers) to solve multi-step, real-life problems related to climate change, such as carbon footprints, temperature changes, and emissions reductions.

Real-Life Context:
The average American has a carbon footprint of about 16 tons of CO_2 per year, while the global average is around 4 tons. Governments and individuals are working to reduce carbon emissions to slow global warming.

Warm-Up (5–10 minutes): Mental Math & Estimation:
Prompt:
The temperature of the Earth has increased by about 1.2°C since the late 1800s.

Estimate the increase in Fahrenheit.
(Hint: Use the formula: F = (9/5)C + 32, but just estimate the increase here.)
Estimation Strategy:
$1.2 \times 2 \approx 2.4$, so an estimate is about 2.2°F.

Activity: Multi-Step Problems (30–35 minutes)
Problem Set: "Tracking Emissions"
Problem 1:
A factory emitted 15.75 tons of CO_2 last month. They installed a cleaner energy system that reduced emissions by 3.5 tons this month.

How much CO_2 was emitted this month?

If this reduction continues for 4 more months, how much total CO_2 will be reduced?

Skills used: decimals, subtraction, multiplication

Problem 2:
An energy audit showed the school uses 2,500 kWh of energy per month. Switching to solar panels will reduce usage by 22.5%.

How many kWh will the school use with solar panels?

How many kWh are saved per month?
Skills used: decimals, percents, subtraction

Problem 3:
The average car emits 4.6 metric tons of CO_2 per year. If a family owns 2 cars, and cuts their driving in half by biking and carpooling:

What will their new total annual emissions be?

How much did they reduce?

Skills used: multiplication, division, subtraction

Problem 4:
Last year, a city's average winter temperature was -3.5°C. This year, it's 1.2°C.

What's the temperature difference?

Convert that difference into Fahrenheit.

Skills used: rational numbers, negative numbers, conversion formula

Class Discussion (5–10 minutes)
Reflection Questions:

How can math help us understand and solve climate-related problems?

Extension (Optional):
Research how your family or school can reduce emissions. Estimate potential savings using math.

Were your answers reasonable? How did you check?

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quizzes, Show What You Know

Summative Assessments: End-of-Unit Assessment

Common Benchmark Assessments: Common Cumulative Assessments

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • coloring tools (as needed) (Lesson 5–6, 8, 15) • concrete model of a hanger (optional) (Lesson 5) • graph paper (as needed) (Lesson 3)

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Accommodations and Modifications:
Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

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- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups
Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice

Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments - Opportunities
for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning
-Enrichment/Extension Activities within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Unit 7

Desired Results

Unit 7 Title: Angles, Triangles, and Prisms

Unit Summary: In this unit, students solve real-life and mathematical problems involving angle measures, volume, and surface area.

Sub-Unit 1: Angle Relationships (Lessons 1–4+ Practice Day + Quiz)

- Determine unknown angle measures using facts about complementary, supplementary, and vertical angles.
- Write and solve equations for unknown angles in a diagram.

Sub-Unit 2: Drawing Triangles (Lessons 5–8 + Practice Day + Quiz)

- Construct triangles given three measures of side lengths or angles.

Sub-Unit 3: Solid Geometry (Lessons 9–13 + Practice Day)

- Solve real-world and mathematical problems involving the volume and surface area of right prisms.

Learning Standards

NJSLS Math:

7.EE Expressions and Equations

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

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

7.G Geometry

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

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.

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

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.

Math Practices: MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)***:**

Students will be able to,

Act as a responsible and contributing community members and employee.
Attend to financial well-being in their life and career.
Consider the environmental, social and economic impacts of decisions.
Demonstrate creativity and innovation throughout their life and career.
Utilize critical thinking to make sense of problems and persevere in solving them.
Model integrity, ethical leadership and effective management.
Plan education and career paths aligned to personal goals.
Use technology to enhance productivity, increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).

9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).

9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.

9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Computer Science & Design Thinking (*CS & DT***):**

The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world. Computational thinking is at the heart of the practices and refers to the thought processes involved in expressing solutions as computational steps that can be carried out by a

computer. It requires understanding the capabilities of computers, formulating problems addressed by a computer, and designing algorithms that a computer can execute. Curriculum writers and educators will want to consider how they can design learning experiences that will enable their students to develop these skills in conjunction with the content knowledge reflected in the core ideas and performance expectations. components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form.

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
What strategies are helpful for determining unknown angle measures? How many unique polygons are possible with different sets of side lengths and angle measurements? What different shapes can you make by slicing through a three-dimensional figure?	We can determine unknown angle measures by using known relationships, such as complementary and supplementary angles, vertical angles, and the angle sums in triangles and other polygons. The number and types of unique polygons that can be formed depend on the lengths of their sides and the measures of their angles, which must follow specific geometric rules. Slicing through three-dimensional figures can produce a variety of two-dimensional shapes, depending on the

	angle and location of the cut. These cross-sections help us understand the structure of 3D objects.

Vocabulary: adjacent angles, complementary angles, cross section, identical copy, supplementary angles, surface area, vertical angles, volume

Students will be able to:

1. **Exploring Angles:** Reason about the measures of angles on a pinwheel. *Building Toward 7.G.B.5 MP1 MP6 MP8*
2. **Complementary and Supplementary Angles:** Describe complementary and supplementary angles. *7.EE.B.4 7.G.B.5 MP6 MP7*
3. **Vertical Angles and Equations:** Write equations to represent complex diagrams and determine unknown angle measures. *7.EE.B.4 7.G.B.5 MP2 MP3 MP7*
4. **Writing Equations and Solving Problems With Angle Relationships:** Use and apply angle relationships to solve multistep problems and determine unknown angle measures. *7.EE.B.4 7.G.B.5 MP1 MP6*
5. **The Triangle Inequality:** Reason about the characteristics of segment lengths that do and do not create triangles. *7.G.A 7.G.A.2 MP1 MP8*
6. **Building Polygons:** Given Side Lengths Make connections between segments and circles and use those circles to create triangles with specific side lengths. *7.G.A 7.G.A.2 MP3 MP5*
7. **Building Triangles With Technology:** Make conjectures about whether triangles will be identical or non-identical when given certain measurements. *7.G.A 7.G.A.2 MP3 MP5*
8. **Drawing Triangles With Rulers and Protractors:** Draw triangles using rulers and protractors given three measurements. *7.G.A 7.G.A.2 MP1 MP6 MP7*
9. **Describing Cross Sections:** Explore and describe possible cross sections of solids. *7.G.A.3 MP3 MP6*
10. **Using Base Area to Calculate Volume:** Expand knowledge of volume and use strategies to calculate the volumes of rectangular and triangular prisms. *7.G.B 7.G.B.6 MP3*
11. **Calculating Volumes of Right Prisms:** Determine the volume of prisms with complex bases by using a variety of volume strategies. *7.G.B 7.G.B.6 MP1 MP3 MP7*

12. **Surface Area of Right Prisms:** Apply different strategies to calculate surface areas of prisms with complex bases. *7.G.B 7.G.B.6 MP5*
13. **Applying Volume and Surface Area:** Decide whether to use volume or surface area strategies in order to solve a real-world problem. *7.G.B 7.G.B.6 MP4*

Learning Activities: *Suggested or Potential Learning Activities*

Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons. The following activities will be used to supplement learning:

- Math IXL Skill Practice and Group Jams based on each lesson. IXL Learning engages students in an authentic way, encouraging them to own their learning, embrace new challenges, and build skills and confidence that last. The program offers personalized skills recommendations based on what each student has been practicing and what they are ready to learn next.
- Education.com practice based on each lesson. Education.com worksheets provide students with extra practice to reinforce key concepts and strengthen their skills. By offering a variety of exercises tailored to different learning levels, these worksheets help students build confidence, improve retention, and master challenging topics through consistent, hands-on practice.
- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students.

Students will work in Math IXL and DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Amplify Desmos Lesson 1 "Pinwheels (Optional)" - Exploring Angles

Day 2: Amplify Desmos Lesson 2 "Friendly Angles" - Complementary and Supplementary Angles

Day 3: Amplify Desmos Lesson 3 "Angle Diagrams" - Vertical Angles and Equations

Day 4: Practice Day: Activities are included in the table below*.

Day 5: Amplify Desmos Lesson 4 "Missing Measures" - Writing Equations and Solving Problems with Angle Relationships

Day 6: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–4. Consider using this time to prepare for the upcoming quiz.

Day 7: Amplify Desmos Lesson 1-4 Sub-Unit Quiz

Day 8: Amplify Desmos Lesson 5 "Can You Build It" - The Triangle Inequality

Day 9: Amplify Desmos Lesson 6 "Is It Enough" - Building Polygons Given Side Lengths

Day 10: Practice Day: Activities are included in the table below*.

Day 11: Amplify Desmos Lesson 7 "More Than One?" - Building Triangles with Technology

Day 12: Amplify Desmos Lesson 8 "Can You Draw It?" - Drawing Triangles with Rulers and Protractors

Day 13: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 5-8. Consider using this time to prepare for the upcoming quiz.

Day 14: Amplify Desmos Lesson 5-8 Sub-Unit Quiz

Day 15: Amplify Desmos Lesson 9 "Slicing Solids" - Describing Cross Sections

Day 16: Amplify Desmos Lesson 10 "Simple Prisms (Optional)" - Using Base Area to Calculate Volume
Day 17: Amplify Desmos Lesson 11 "Complex Prisms" - Calculating Volumes of Right Prisms

Day 18: Practice Day: Activities are included in the table below*.

Day 19: Amplify Desmos Lesson 12 "Surface Area Strategies" - Surface Area of Right Prisms

Day 20: Amplify Desmos Lesson 13 "Popcorn Possibilities" - Applying Volume and Surface Area

Day 21: Amplify Desmos Practice Day (Test Review): Practice the concepts and skills developed during Lessons 1–13. Consider using this time to prepare for the upcoming assessment.

Day 22: Amplify Desmos 7.7 End of Unit Assessment:

Pacing Considerations

Lesson 1 (Optional): This lesson can be omitted because it is a review of angles and how to estimate angle measures from Grade 4.

Lesson 10 (Optional): This lesson can be omitted because it is a review of calculating the volumes of rectangular prisms and triangular prisms from Grade 6.

Lesson 13: This lesson gives students an opportunity to apply their knowledge of surface area and volume to solve a complex problem. There is no new content introduced in this lesson.

Practice Day 2 (Optional): This practice day is optional because it addresses supporting or additional work.

Activities for Unit 7: Lesson's 1-13*

IXL Skills for the Lesson	**Delta Math Skills for the Lesson**	**Education.com Resources for the Lesson**
• 2UG-Y1 Name Measure and Classify Angles • JPE-Y2 Lines, Line Segments and Rays • 58L-Y3 Parallel, Perpendicular and Intersecting Lines • HKG-Y4 Identify Supplementary, Complimentary, Vertical and Adjacent Angles • CST-Y5 Find Measures of Supplementary, Complimentary, Vertical and Adjacent Angles • DN9-Y6 Write and Solve Equations Solving using Angle Relationships • 4U6-Z8 Find Missing Angles of Triangles • RFP-CC1 Surface Area of Cubes and Prisms • URT-CC5 Volume of Cubes and Prisms • 8WV-CC6 Volume of Cubes and	• The Triangle Inequality • Name Angles • Drawing Angles Level 1 • Measuring Angles with a Protractor • Identify Angles with Terminology • Investigate Vertical Angles with a Protractor • Vertical/Adjacent/Complementary Angles L1 • Vertical/Adjacent/Complementary Angles (Algebraic) • Angle Terminology with Equations • Surface Area of Rectangular Prisms • Surface Area of Square Pyramids • Surface Area of a Cylinder • Volume of Rectangular Prism Visually • Volume of Rectangular Prisms	• Angle Relationships Handout • Angle Relationships Guided Notes • Identifying Complementary, Supplementary, Vertical, and Adjacent Angles • Complementary and Supplementary Angles #1, #2, #3 • Solving Problems Using Angle Relationships #1, #2 • How Many Triangles Can Be Created? • Constructing Triangles Given Conditions • Constructing Geometric Shapes • Cross Sections of Three-Dimensional Figures: Part 1 • Cross Sections of Three-Dimensional Figures: Part 2

Rectangular Prisms Word Problems •	• Identify Cross Sections of Solids	• Surface Area of Prisms • Volume of Right Prisms
Additional Activities	Performance Task Angles Complementary, Supplementary & Adjacent Angles Practice Angles that Share a Vertex Practice Finding Missing Angles/ Complimentary Angles Practice Interior Exterior Angles of Triangles Practice Constructing Triangles Given Angles or Side Length Practice Constructing Triangles Given Angles or Side Lengths Practice 2/ Reteach	

Assessment Evidence
Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quizzes, Show What You Know
Summative Assessments: End-of-Unit Assessment
Common Benchmark Assessments: Common Cumulative Assessments
Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: 8.5" by 11" paper (optional) (Lesson 13) • coloring tools (as needed) (Lesson 10) • compasses (Lesson 8) • linkage strips (optional) (Lesson 5) • pinwheel (optional) (Lesson 1) • protractors (Lessons 4, 6–8) • rulers (Lessons 4–8, 12) • three-dimensional figures (as needed) (Lesson 9) • tracing paper (Lessons 6–7)

Math IXL Flex Diagnostic & Practice , Education.com, Delta Math, LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

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

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Specific Strategies and Practices that Support English Language Learners
English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups
Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice
Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments - Opportunities
for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning
-Enrichment/Extension Activities within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Unit 8

Desired Results

Unit 8 Title: Probability and Sampling

Unit Summary: Students learn about probability as a way to describe the likelihood of unknown events and use simulations to estimate the probability of real-world situations. They use samples to draw conclusions about and compare populations.

Sub-Unit 1: Probability (Lessons 1–8 + Practice Day + Quiz)

- Compare the results of repeated experiments and the expected probability.
- Determine the probability of events by identifying the sample space or designing and using simulations.
- Interpret the results from repeated experiments to determine fairness, probability, and the likelihood of events.

Sub-Unit 2: Sampling (Lessons 9–15 + Practice Day)

- Use measures of center and measures of variability from random samples to draw conclusions about and compare populations.
- Explain the purpose of sampling which methods of obtaining a sample tend to produce representative samples.

Learning Standards

NJSLS Math:

7.EE Expressions and Equations

B. Solve real-life and 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*

$\frac{1}{10}$ *of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *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.*

7.RP Ratios and Proportional Relationships

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 units. *For example, if a person walks*

$\frac{1}{2}$ *mile in each* $\frac{1}{4}$ *hour, compute the unit rate as the complex fraction* $\left(\frac{1}{2}\right)/\left(\frac{1}{4}\right)$ *miles per hour, equivalently 2 miles per hour.*

2. Recognize and represent proportional relationships between quantities.

7.SP. Statistics and Probability

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.*

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.*

C. Investigate chance processes and develop, use, & 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 ½ indicates an event that is neither unlikely or 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?*

Math Practices: MP1, MP3, MP7

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

Students will be able to,
Act as a responsible and contributing community member and employee.
Attend to financial well-being in their life and career.
Consider the environmental, social and economic impacts of decisions.
Demonstrate creativity and innovation throughout their life and career.
Utilize critical thinking to make sense of problems and persevere in solving them.
Model integrity, ethical leadership and effective management.
Plan education and career paths aligned to personal goals.
Use technology to enhance productivity, increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).

9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).

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Computer Science & Design Thinking (*CS & DT***):**

The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world. Computational thinking is at the heart of the practices and refers to the thought processes involved in expressing solutions as computational steps that can be carried out by a computer. It requires understanding the capabilities of computers, formulating problems addressed by a computer, and designing algorithms that a computer can execute. Curriculum writers and educators will want to consider how they can design learning experiences that will enable their students to develop these skills in conjunction with the content knowledge reflected in the core ideas and performance expectations. components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form.

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
How can we determine how likely an event is to happen? How can we simulate events in the world to make predictions? When is a sample representative of a population?	The likelihood of an event can be determined by analyzing the ratio of favorable outcomes to the total number of possible outcomes, known as probability.

How might this affect our analysis?	Simulations can model real-world events by mimicking randomness and variability, helping us make predictions and estimate probabilities when exact calculations are difficult. A sample is representative of a population when it reflects the population's characteristics fairly and without bias. If a sample is not representative, it can lead to inaccurate or misleading conclusions in data analysis and predictions.
Vocabulary: compound (multistep) event, event, experiment, outcome, population, probability, random, relative frequency, representative (sample), sample, sample space, simulation, tree diagram	
Students will be able to: 1. **Chance Experiments*:** Use phrases such as "likely" and "equally likely as not" to describe the likelihood of different events. *Building Toward: 7.SP.C.6 MP3* 2. **Intro to Probability:** Connect likelihood with probability written in different forms and use sample spaces to help determine probabilities. *7.EE.B.3 7.SP.C.5 7.SP.C.7.A MP5* 3. **Predicting Sample Spaces:** Use repeated experiments and proportionality to make predictions and recognize that the number of repeated experiments affects the accuracy of a prediction. *7.RP.A 7.SP.C.5 7.SP.C.6 MP1 MP3* 4. **Repeated Experiments:** Recognize that the results of a repeated experiment will approach, but may not exactly match, the probability of the event. *7.SP.C.6 7.SP.C.7 7.SP.C.7.B MP1 MP3 MP8*	

5. **Comparing Probabilities and Experiments:** Decide whether an object is fair by comparing probabilities from a model to the results of a repeated experiment. *7.SP.C.6 7.SP.C.7 7.SP.C.7.B MP2 MP8*
6. **Compound Events:** Use lists, tables, and tree diagrams to represent the sample space of events. Determine the probabilities of compound events and whether games are fair. *7.SP.C.8 7.SP.C.8.A 7.SP.C.8.B MP5*
7. **Estimating Probabilities Using Simulation**: Use probability tools to simulate compound real-world events. *7.SP.C.8 7.SP.C.8.C MP2 MP3 MP4*
8. **Designing Simulations*:** Design and perform simulations to estimate the probabilities of compound events. *7.SP.C.8 7.SP.C.8.C MP1 MP4*
9. **Using Mean and MAD to Compare Groups:** Analyze and compare sets of data by calculating the mean and mean absolute deviation (MAD) to make a recommendation for a real-world situation. *7.SP.B 7.SP.B.4 MP2 MP3*
10. **Sampling From Large Populations:** Explore the advantages and disadvantages of using samples to answer a question about a population. *7.SP.A.1 MP1 MP3 MP7*
11. **Sampling Bias:** Explore techniques for gathering a sample and explain whether a given sampling method is likely to produce representative data. *7.SP.A.1 MP3*
12. **Using Percentages to Predict Populations:** Use data from a sample to estimate the number of marigolds in a large flower garden using proportional relationships and percentages. *7.RP.A 7.SP.A.1 7.SP.A.2 MP1 MP3*
13. **Using Median and IQR to Make Predictions:** Draw conclusions about a population using quantitative data and estimate a measure of center of a population based on one or more samples of the population. *7.SP.A.2 7.SP.B.3 7.SP.B.4 MP3 MP6*
14. **Comparing Populations:** Compare two populations by comparing the difference between the centers of samples with a measure of variability. *7.SP.B.3 7.SP.B.4 MP1 MP6*
15. **Putting It All Together*:** Analyze real data about air quality and generate random samples to compare the air quality of different places. *7.SP.A.1 7.SP.A.2 7.SP.B.4 MP1 MP2 MP4*

**Optional Lessons*

Learning Activities: *Suggested or Potential Learning Activities*

Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons. The following activities will be used to supplement learning:

- Math IXL Skill Practice and Group Jams based on each lesson. IXL Learning engages students in an authentic way, encouraging them to own their learning, embrace new challenges, and build skills and confidence that last. The program offers personalized skills recommendations based on what each student has been practicing and what they are ready to learn next.
- Education.com practice based on each lesson. Education.com worksheets provide students with extra practice to reinforce key concepts and strengthen their skills. By offering a variety of exercises tailored to different learning levels, these worksheets help students build confidence, improve retention, and master challenging topics through consistent, hands-on practice.
- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students.

Students will work in Math IXL and DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Amplify Desmos Lesson 1 "How Likely (Optional)" - Chance Experiments

Day 2: Amplify Desmos Lesson 2 "Prob-bear-bilities" - Intro to Probability

Day 3: Practice Day: Activities are included in the table below*.

Day 4: Amplify Desmos Lesson 3 "Mystery Bag" - Predicting Sample Spaces

Day 5: Amplify Desmos Lesson 4 "Spin Class" - Repeated Experiments

Day 6: Practice Day: Activities are included in the table below*.

Day 7: IXL Lessons 1-4 Quiz

Day 8: Amplify Desmos Lesson 5 "Is It Fair?" - Comparing Probabilities and Experiments

Day 9: Amplify Desmos Lesson 6 "Fair Games" - Compound Events

Day 10: Practice Day: Activities are included in the table below*.

Day 11: Amplify Desmos Lesson 7 "Weather or Not" - Estimating Probabilities Using Simulation

Day 12: Amplify Desmos Lesson 8 "Simulate It (Optional)" - Designing Simulations

Day 13: Amplify Desmos Practice Day (Quiz Review): Practice the concepts and skills developed during Lessons 1–8. Consider using this time to prepare for the upcoming quiz.

Day 14: Amplify Desmos Lesson 1-8 Sub-Unit Quiz

Day 15: Amplify Desmos Lesson 9 "Car, Bike, or Train?" - Using Mean and MAD to Compare Groups

Day 16: Amplify Desmos Lesson 10 "Crab Island" - Sampling from Large Populations

Day 17: Amplify Desmos Lesson 11 "Headlines" - Sampling Bias

Day 18: Practice Day: Activities are included in the table below*.

Day 19: IXL Lessons 9-11 Quiz

Day 20: Amplify Desmos Lesson 12 "Flower Power" - Using Percentages to Predict Populations

Day 21: Amplify Desmos Lesson 13 "Plots and Samples" - Using Medians and IQR to Make Predictions

Day 22: Amplify Desmos Lesson 14 "School Newspaper" - Comparing Populations

Day 23: Amplify Desmos Lesson 15 "Air Quality (Optional)" - Putting It All Together

Day 24: Amplify Desmos Practice Day (Test Review): Practice the concepts and skills developed during Lessons 1–15. Consider using this time to prepare for the upcoming assessment.

Day 25: Amplify Desmos 7.8 End of Unit Assessment:

Pacing Considerations

Lesson 1 (Optional): This lesson surfaces what students know about likelihood, which will be addressed further in upcoming lessons. If omitted, the vocabulary from this lesson should be defined during Lesson 2.

Lesson 8 (Optional): If students show a strong understanding of designing and performing their own simulations to estimate probabilities of real-world situations, this lesson may be omitted.

Lesson 15 (Optional): There is no new content in this lesson so it may be omitted. If omitted, be sure to discuss throughout the unit how probability and sampling can be empowering to better understand the

environment in which we live.

Practice Days 1 and 2 (Optional): These Practice Days are optional because they address supporting or additional work.

Activities for Unit 8: Lesson's 1-15*

IXL Skills for the Lesson	**Delta Math Skills for the Lesson**	**Education.com Resources for the Lesson**
• J6M-II1 Sample Spaces of Simple Events • ZZB-II2 Probability of Simple Events • F88-II3 Probability of Simple Events and Opposite Events • 8TP-II4 Probability of Mutually Exclusive Events and Overlapping Events • 9AA-II5 Experimental Probability • WP6-II6 Making Predictions using Experimental Probability • VST-II7 Use collected Data to Find Probabilities and Make Predictions • 9UW II8- Using Theoretical Probability to Make Predictions • D87-II14 Which Simulation Represents the Situation?	• Probability Language (Level 1) • Convert Fraction/Decimal/Percent • Simple Probability (L1) • Simple Probability (L2) • Most/Least Likely • Expected Value • Fundamental Counting Principle • Interpret Dot Plot • Interpret Histograms / Bar Charts • Interpret Box Plot • Finding the Mean and Median • Interpret Mixed Representations • Center and Spread Visually • Compare Representations of Data	• Intro to Probability: Fruit • Probability of Simple Events • What's the Probability? • Experimental Probability • Probability Models • Experimental Probability Models • Probability Dice: Practice With Probability Models • Make Predictions Using Theoretical Probability • Make Predictions Using Experimental Probability • Sample Spaces of Compound Events • Probabilities of Compound Events • Simulate Compound Events #1, #2, #3 • Probability: The First 100 Digits of Pi

• U2A-HH1 Calculate Mean, Mode, Mean and Range • CYK-HH2 Interpret Graphs and Charts to Find the Mean, Median, Mode and Range • ZWS-HH3 Mean, Mode, Mean and Range Find the Missing Number • 9UP-HH4 Changes in Mean, Mode, Mean and Range • YNM-HH5 Calculate Mean Absolute Deviation • NZN-HH6 Calculate Quartiles and Interquartile Range • XHL-HH7 Identify and Outlier • YHZ-HH8 Populations and Samples • 2BM- HH10 Make Inferences from Multiple Samples		• A Festival of Fun: Probability Performance Task • Making Comparative Inferences • Drawing Inferences Using Data
Additional Activities	Probability Performance Task Defining Outcomes, Events and Sample Space Practice Finding Probability of Simple Events Practice Probability and Relative Frequency Practice Developing Probability Models/Simulation Practice Probability Enrichment Interpreting Quartiles and Quartile Ranges Practice Box Plots and Mean Absolute Deviation Practice Understanding Random Sampling Methods Practice Using Statistics to Make Inferences about Populations Practice	

	Performance Task for Statistics

Assessment Evidence

Formative Assessments: Pre-Unit Check, Sub-Unit Quizzes, Show What You Know

Summative Assessments: End-of-Unit Assessment Form A and B

Common Benchmark Assessments: Common Cumulative Assessments

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • calculators (as needed) (Lesson 12) • coins, two different types (Lessons 1–2, 5–8) • coloring tools (Lessons 2–4) • containers for paper letters (e.g., bag, bowl, or cup) (Lessons 1, 8) • number cubes, two different types (Lessons 1–2, 5, 7–8) • paper clips for spinners (Lessons 1–2, 4, 6–7)

Math IXL Flex Diagnostic & Practice , Education.com, Delta Math, LinkIt!

Accommodations and Modifications:
Students with Disabilities, English Language Learners,
Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:

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

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Specific Strategies and Practices that Support English Language Learners

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice Alternate or reduced work within Digital Platforms such as Math IXL, Delta Math, and Link It assignments - Opportunities

for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning

-Enrichment/Extension Activities within Digital Platforms such as Math IXL, Delta Math, and Link It assignments

Grade 7 Content Emphases

Major, Supporting, and Additional Clusters

Emphases are given at the cluster level. Refer to the New Jersey Student Learning Standards for Mathematics for the specific standards that fall within each cluster.

Key: **M** — Major, **S** — Supporting Clusters, **A** — Additional Clusters

Grade 7: Major, Supporting, and Additional Clusters

Indicator	Type	Cluster Heading
7.RP.A	**M**	Analyze proportional relationships and use them to solve real-world and mathematical problems
7.NS.A	**M**	Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers
7.EE.A	**M**	Use properties of operations to generate equivalent expressions
7.EE.B	**M**	Solve real-life and mathematical problems using numerical and algebraic expressions and equations
7.G.A	**A**	Draw, construct and describe geometrical figures and describe the relationships between them
7.G.B	**A**	Solve real-life and mathematical problems involving angle measure, area, surface area and volume
7.SP.A	**S**	Use random sampling to draw inferences about a population
7.SP.B	**A**	Draw informal comparative inferences about two populations
7.SP.C	**S**	Investigate chance processes and develop, use, and evaluate probability models.

Required Fluencies in Grade 7

7.EE.B.4a Solve equations of the form $px + q = r$ and $p(x + q) = r$.