Belvidere Cluster Wide
Mathematics Curriculum
7th grade (Advanced)
Updated Fall 2018

All Belvidere Cluster curriculum and instruction areas are aligned to the New Jersey Student Learning Standards (NJSLS) in accordance with the NJ Department of Education's curriculum implementation requirements.

Interdisciplinary Connections

– English Language Arts
– Science and Scientific Inquiry (Next Generation)
– Social Studies, including American History, World History, Geography, Government and Civics, and Economics
– Technology
– Visual and Performing Arts
– World languages

Technology Standards and Integration
Chromebooks
iXL.com
Holt/Textbook online resources
Interactive SmartBoard activities

NJSLA Technology
8.1.2.A.2
Create a document using a word processing application.
8.1.2.A.4
Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.P.B.1
Create a story about a picture taken by the student on a digital camera or mobile device.
8.1.P.C.1
Collaborate with peers by participating in interactive digital games or activities.
8.1.2.E.1
Use digital tools and online resources to explore a problem or issue.

CAREER EDUCATION
(NJDOE CTE Clusters)

– Agriculture, Food & Natural Resources
– Architecture & Construction
– Arts, A/V Technology & Communications
– Business Management & Administration
– Education & Training
– Finance
– Government & Public Administration

– Health Science
– Hospitality & Tourism
– Human Services
– Information Technology
– Law, Public Safety, Corrections & Security
– Manufacturing
– Marketing
– Science, Technology, Engineering & Mathematics (STEM)
– Transportation, Distribution & Logistics

21st Century Skills/ Themes
– Financial, Economic, Business and Entrepreneurial Literacy
– Creativity and Innovation
– Critical Thinking
– Problem Solving
– Communication
– Collaboration
– Information Literacy

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP5. Consider the environmental, social and economic impacts of decisions.
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP10. Plan education and career paths aligned to personal goals.
CRP11. Use technology to enhance productivity.
CRP12. Work productively in teams while using cultural global competence.

Accommodations

Special Education
– Printed copy of board work/notes provided
– Additional time for skill mastery
– Assistive technology
– Behavior management plan
– Center-Based Instruction
– Check work frequently for understanding
– Computer or electronic device utilization
– Extended time on tests/ quizzes
– Have student repeat directions to check for understanding
– Highlighted text visual presentation
– Modified assignment format
– Modified test content
– Modified test format
– Modified test length
– Multiple test sessions
– Multi-sensory presentation
– Preferential seating
– Preview of content, concepts, and vocabulary
– Reduced/shortened written assignments

– Secure attention before giving instruction/directions
– Shortened assignments
– Student working with an assigned partner
– Teacher initiated weekly assignment sheet
– Use open book, study guides, test prototypes
– Choice of activities
– Cubing activities
– Exploration by interest
– Flexible grouping
– Goal setting with students
– Jigsaw
– Mini workshops to re-teach or extend skills Open-ended activities
– Think-Pair-Share
– Varied supplemental materials

ELL
– Allowing students to correct errors (looking for understanding)
– Teaching key aspects of a topic Eliminate nonessential information Using videos, illustrations, pictures, and drawings to explain or clarify
– allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slideshows, videos, etc.) to demonstrate student's learning
– Allowing students to correct errors (looking for understanding)
– Allowing the use of note cards or open-book during testing
– Decreasing the amount of work presented or required
– Having peers take notes or providing a copy of the teacher's notes
– Modifying tests to reflect selected objectives
– Providing study guide
– Reducing the number of answer choices on a multiple choice test
– Tutoring by peers
– Using true/false, matching, or fill in the blank tests in lieu of essay tests

At Risk
– Allowing students to correct errors (looking for understanding)
– Teaching key aspects of a topic Eliminate nonessential information allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slideshows, videos, etc.) to demonstrate student's learning
– Allowing students to select from given choices .
– Allowing the use of note cards or open-book during testing
– Collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test
– decreasing the amount of work presented or required .
– Having peers take notes or providing a copy of the teacher's notes
– Marking students' correct and acceptable work, not the mistakes
– Modifying tests to reflect selected objectives
– Providing study guides
– Reducing or omitting lengthy Outside reading assignments
– Reducing the number of answer choices on a multiple choice test
– Tutoring by peers
– Using authentic assessments with real-life problem-solving
– Using true/false, matching, or fill in the blank tests in lieu of essay tests
– using videos, illustrations, pictures, and drawings to explain or clarify

– Cubing activities
– Flexible grouping
– Goal setting with students
– Jigsaw
– Mini workshops to re-teach or extend skills Open-ended activities
– Think-Pair-Share
– Varied supplemental materials

<u>Gifted and Talented</u>
– Alternative formative and summative assessments
– Choice boards
– Games and tournaments
– Group investigations
– Guided Reading
– Independent research and projects Interest groups
– Learning contracts
– Leveled rubrics
– Multiple intelligence options
– Multiple texts
– Personal agendas
– Project-based learning
– Problem-based learning
– Stations/centers
– Think-Tac-Toes
– Tiered activities/assignments
– Tiered products
– Varying organizers for instructions

<u>504</u>
– Printed copy of board work/notes provided
– Additional time for skill mastery
– Assistive technology
– Behavior management plan
– Center-Based Instruction
– Check work frequently for understanding
– Computer or electronic device utilization
– Extended time on tests/ quizzes
– Have student repeat directions to check for understanding
– Highlighted text visual presentation
– Modified assignment format
– Modified test content
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– Choice of activities
– Cubing activities
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– Varied supplemental materials

Belvidere Cluster Wide Mathematics Curriculum 7th Grade Advanced Unit Plan	
Title: 2D Geometry	
Grade Level: 7th Grade	Approximate Length of Time: 3 weeks
Chapter Summary: This chapter will allow students to solve for area and perimeter of different 2D geometrical shapes. They will calculate the area of rectangles, parallelograms, triangles, trapezoids, circles, irregular figures, and shaded figures. They will also explore special pairs of angles and the relationships they hold.	
Learning Targets	
PARCC ■ Major Clusters; ☐ Supporting Clusters; ○ Additional Clusters	
Domain: Geometry	
Cluster: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	
Standard #s:	Standards:
7.G.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
7.G.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.
7.G.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.
Domain: Expressions and Equations	
Cluster: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
Standard # :	Standard:
7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
7.EE.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
Chapter Essential Question: · What is difference between area and perimeter?	Chapter Enduring Understandings: · Formulas can be determined and used to calculate the area of both regular and irregular shapes.

Chapter Objectives:

- Students will calculate the perimeter of different 2D geometrical figures.
- Students will calculate the circumference and area of different circles.
- Students will be able to determine whether a triangle is possible or not.
- Students will discover special pairs of triangles and the relationships they yield.
- Students will calculate the area of rectangles, parallelograms, triangles and trapezoids.
- Students will use previous knowledge of area formulas to calculate the area of irregular and shaded figures.

Evidence of Learning

Possible Formative Assessments:

- SMART Response questions used throughout the chapter.
- Quizzes
- Homework/Classwork
- Labs/projects
- IXL.com
- tenmarks.com

Summative Assessment:

- Chapter Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

- Choice boards - projects
- Skit
- Demonstration
- Journaling
- Conferencing

Suggested Lesson Plan	
Topics	Approximate Timeframe
Topic #1: Special Pairs of Angles	1.5 days
Topic #2: Perimeter & Circumference Lab: RAFT – Finding Pi	2 days
Topic #3: Area of Rectangles	1 day
Topic #4: Area of Parallelograms	1.5 days
Topic #5: Area of Triangles	1 day
Topic #6: Area of Trapezoids	1 day
Topic #7: Area of Circles	1.5 days
Topic #8: Mixed Review	1 day
Topic #9: Area of Irregular Figures	2 day
Topic #10: Area of Shaded Regions	1.5 days
Review and Chapter Test	2 days

Materials and Curriculum Resources:

- https://njctl.org/courses/math/7th-grade/
- http://www.raftbayarea.org/ideas/Finding%20Pi.pdf

- http://www.kahnacademy.org
- Approved Classroom Textbooks

<table>
<tr><td colspan="2" align="center">Belvidere Cluster Wide
Mathematics Curriculum
7th Grade Advanced
Unit Plan</td></tr>
</table>

Title: 2D Geometry

Grade Level: 7	**Approximate Length of Time:** 5 weeks

Chapter Summary: Students will be able to use models to show their understanding of congruent and similar one and two-dimensional figures.

<table>
<tr><td colspan="2" align="center">Learning Targets</td></tr>
<tr><td colspan="2">PARCC ■ Major Clusters; □ Supporting Clusters; ○ Additional Clusters</td></tr>
<tr><td colspan="2">Domain: Geometry</td></tr>
<tr><td colspan="2">Cluster: Understand congruence and similarity using physical models, transparencies, or geometry software.</td></tr>
<tr><td>Standard #s:</td><td>Standards:</td></tr>
<tr><td>8.G.1</td><td>Verify experimentally the properties of rotations, reflections, and translations:
<ol type="a">
Lines are taken to lines, and line segments to line segments of the same length.
Angles are taken to angles of the same measure.
Parallel lines are taken to parallel lines.</td></tr>
<tr><td>8.G.2</td><td>Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</td></tr>
<tr><td>8.G.3</td><td>Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</td></tr>
<tr><td>8.G.4</td><td>Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</td></tr>
<tr><td>8.G.5</td><td>Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. <i>For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.</i></td></tr>
<tr><td colspan="2">Domain: Standards for Math Practice</td></tr>
<tr><td>Standard#:</td><td>Standard:</td></tr>
<tr><td>MP1</td><td>Making sense of problems and persevere in solving them.</td></tr>
<tr><td>MP2</td><td>Reason abstractly and quantitatively.</td></tr>
<tr><td>MP3</td><td>Construct viable arguments and critique the reasoning of others.</td></tr>
<tr><td>MP4</td><td>Model with mathematics.</td></tr>
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MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

Chapter Essential Questions:	**Chapter Enduring Understandings:**
● How can you use models of one and two-dimensional figures to show congruent figures? ● How can you use models of one and two-dimensional figures to show similar figures?	● Congruent figures can be formed by a series of transformations. ● Similar figures can be formed by a series of transformations. ● Understand angle relationships in one and two-dimensional figures.

Chapter Objectives:
- *Students will be able to transform figures on a coordinate plane.*
- *Students will be able to use their understanding of angle relationships to find unknown angles.*
- *Students will be able to describe a sequence of transformations that will result in congruent figures.*
- *Students will be able to describe a sequence of transformations and dilations that will result in similar figures.*

Evidence of Learning

Possible Formative Assessments:
- SMART Response questions used throughout the chapter.
- Quizzes
- Homework/Classwork
- Labs/Projects
- IXL.com
- firstinmath.com
- tenmarks.com

Summative Assessment:
- Unit Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:
- Choice boards - projects
- Skit
- Demonstration
- Journaling
- Conferencing

Suggested Lesson Plan

Topics	Approximate Timeframe
Topic #1: Translations	3.5 days

Suggested Lab: Translations	
Topic #2: Rotations	3 days
Topic #3: Reflections	2.5 days
Topic #4: Dilations Suggested Lab: Dilations	3 days
Topic #5: Symmetry	2 days
Topic #6: Congruence & Similarity	3.5 days
Topic #7: Special Pairs of Angles	3.5 days
Topic #8: Remote Exterior Angles	2 days
Review & Unit Test	2 days

Materials and Curriculum Resources:

- https://njctl.org/courses/math/8th-grade-math/
- https://www.engageny.org/resource/grade-8-mathematics-module-2-topic-overview
- http://kahnacademy.com
- Approved Classroom Textbooks

Lesson Components

21st Century Skills

- Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Themes

- Critical Thinking and Problem Solving
- Communication and Collaboration
- Life and Career Skills

Title: 3D Geometry

Grade Level: 7	**Approximate Length of Time:** 2 weeks

Chapter Summary: This chapter will allow students to learn about 3-dimensional solids and how to calculate their volume. They will also use these formulas to solve real world problems.

Learning Targets

PARCC ■ Major Clusters; □ Supporting Clusters; ○ Additional Clusters

Domain: Geometry

Cluster: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

Standard #:	Standard:
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Domain: Standards for Math Practice

Standard#:	Standard:
MP1	Making sense of problems and persevere in solving them.
MP2	Reason abstractly and quantitatively.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

Chapter Essential Question:	**Chapter Enduring Understanding:**
· What is a 3-dimensional figure? · How can I find the volume of a 3-dimensional figure? · How can the volume of a 3-dimensional figure help me solve real world problems?	· There are different formulas that can be used when solving for the volume of a 3-dimensional figure.

Chapter Objectives:
- *Students will identify what a 3-dimensional figure is.*
- *Students will use a formula to find the volume of a prism and cylinder.*
- *Students will use a formula to find the volume of pyramids, cones & spheres.*

Evidence of Learning

Possible Formative Assessments:

· SMART Response questions used throughout the chapter.
· Quizzes
· Homework/Classwork
· Labs/Projects
· Q and A
· IXL.com
· tenmarks.com
· firstinmath.com

Summative Assessment:

· Unit Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

● Choice boards - projects
● Skit
● Demonstration
● Journaling
● Conferencing

Suggested Lesson Plan	
Topics	**Approximate Timeframe**
Topic #1: 3-Dimensional Solids	3 days
Suggested Lab #1: Volume Activity Topic #2: Volume-Prisms and Cylinders	2 days
Topic #3: Volume-Pyramids, Cones & Spheres Suggested Lab: RAFT – Volume Verification	3 days
Review and Chapter Test	2 days

Materials and Curriculum Resources:

· https://njctl.org/courses/math/8th-grade-math/
· http://www.njctl.org/courses/math/8th-grade-math/3d-geometry/volume-activity
· http://www.raftbayarea.org/ideas/Volume%20Verification.pdf
· http://www.kahnacacemy.org
· Approved Classroom Textbook

Lesson Components

21st Century Skills

● Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Themes

● Critical Thinking and Problem Solving
● Communication and Collaboration
● Life and Career Skills

Title: Data

Grade Level: 7	Approximate Length of Time: 3 weeks

Chapter Summary: This chapter will allow students to examine scatter plots and interpret data into a graph. They will be able to understand different patterns and lines of best fit within graphs. They will use linear models and two variable data to explain real life situations. They also will examine frequencies and bivariate data.

Learning Targets

PARCC ■ Major Clusters; ▫ Supporting Clusters; ○ Additional Clusters

Domain: Statistics & Probability

Cluster: Investigate patterns of association in bivariate data.

Standard #s:	Standards:
8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Domain: Standards for Math Practice	
Standard#:	Standard:

MP1	Making sense of problems and persevere in solving them.
MP2	Reason abstractly and quantitatively.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

Chapter Essential Questions:	Chapter Enduring Understandings:
· How can information from a problem be represented in a way to see a pattern or a frequency? · What is a line of best fit and how can it simply a conclusion? · Are interpretation and prediction an accurate conclusion for a problem?	· Scatter plots, line of best fit, and frequencies all help interpret data within a problem. · Patterns can be modeled using different graphs. · Straight lines are widely used to model relationships.

Chapter Objectives:
- · Student will be able to graph scatter plots.
- · Students will interpret and examine data to come to a conclusion.
- · Students will know about line of best fit and two variable data relationships.
- · Students will understand patterns of association in bivariate categorical data.
- · Students will use frequency to solve real life problems and make predictions for future ones.

Evidence of Learning

Possible Formative Assessments:
- · SMART Response questions used throughout the chapter.
- · Quizzes
- · Homework/Classwork
- · Labs/Projects
- · Q and A
- · IXL.com
- · firstinmath.com
- · tenmarks.com

Summative Assessment:
- ● Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:
- ● Choice boards - projects
- ● Skit
- ● Demonstration
- ● Journaling

● Conferencing	

Suggested Lesson Plan	
Topics	Approximate Timeframe
Topic #1: Two Variable Data Suggested Lab: RAFT – Stars on the HR Diagram	3 days
Topic #2: Line of Best Fit Suggested Lab: Illustrative Mathematics – Bird Eggs	3 days
Topic #3: Determining the Prediction Equation	4 days
Topic #4: Two Way Table	3 days
Review and Chapter Test	2 days

Materials and Curriculum Resources:

- https://njctl.org/courses/math/8th-grade-math/
- http://www.raftbayarea.org/ideas/Stars%20on%20the%20HR%20Diagram.pdf
- http://www.illustrativemathematics.org/illustrations/41
- http://www.kahnacademy.com
- Approved Classroom Textbooks

Lesson Components

21st Century Skills

- Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Themes

- Critical Thinking and Problem Solving
- Communication and Collaboration
- Life and Career Skills

Title: Drawing Geometric Figures

Grade Level: 7th Grade	Approximate Length of Time: 1 week

Chapter Summary: This chapter will have students determining if a triangle can be created using the given conditions. Students will also create some simple geometric constructions.

Learning Targets

PARCC ■ Major Clusters; □ Supporting Clusters; ○ Additional Clusters

Domain: Geometry

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

Standard #s:	Standards:
7.G.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

Chapter Essential Questions:	Chapter Enduring Understandings:
· Can we determine if three side lengths would create a triangle?	· Geometric figures can be drawn based on given conditions.

Chapter Objectives:

- · Students will be able to determine is a triangle is possible.
- · Students will be able to draw triangles freehand, with ruler and protractor and with technology.

Evidence of Learning

Possible Formative Assessments:

- · SMART Response questions used throughout the chapter.
- · Quiz
- · homework/classwork
- · labs/projects
- · IXL.com
- · tenmarks.com
- · firstinmath.com

Summative Assessment End of unit test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

- ● Choice boards - projects
- ● Skit
- ● Demonstration
- ● Journaling
- ● Conferencing

Lesson Plan

Topics	Approximate Time Frame

Topic #1: Determining if a Triangle is Possible	2 days
Topic #2: Geometric Constructions: The Basics	2.5 days

Curriculum Resources:

· https://njctl.org/courses/math/7th-grade/
· http://kahnacademy.org
· Approved Classroom Textbooks

Belvidere Cluster Wide
Mathematics Curriculum
7th Grade Advanced
Unit Plan

Title: Equations & Inequalities	
Grade Level: 7th Grade	Approximate Length of Time: 4 weeks

Chapter Summary: This chapter will introduce students to different properties equations can have. They will be able to combine like terms, solve multi-step equations, and deal with inequalities. Also, they will identify what the associative, commutative, and distributive properties are.

Learning Targets

PARCC ■ Major Clusters;   □ Supporting Clusters;   ○ Additional Clusters

Domain: Expressions and Equations

Cluster: Use properties of operations to generate equivalent expressions

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

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

Standard #s:	Standards:
7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

7.EE.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width? b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions

Domain: Standards for Math Practice

Standard#:	Standard:
MP1	Making sense of problems and persevere in solving them.
MP2	Reason abstractly and quantitatively.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

Chapter Essential Questions:	Chapter Enduring Understandings:
· How are equations solved? · What are different properties of equations and how can they help solve them? · What happens when two sides of an equation are not equal?	· Equations can be solved using different properties. · Sometimes there is more than one step to solve in an equation. · Inequalities are used when solving for real life application problems.

Chapter Objectives:

- ·   Students will examine commutative and associative properties of different equations.

- ·   Students will combine like terms within an equation and learn to use the distributive property to solve equations.

- ·   Students will solve multi-step equations involving different techniques.

- ·   Students will graph and solve inequalities involving addition, subtraction, multiplication, and division.

Evidence of Learning

Possible Formative Assessments:

- ·   SMART Response questions used throughout the chapter.
- ·   Quizzes
- ·   Homework/Classwork
- ·   Labs/Projects
- ·   IXL.com
- ·   tenmarks.com
- ·   firstinmath.com

Summative Assessment:

· Unit Test

Benchmark Assessments:
Mid and end of unit teacher-created checkpoints
Textbook unit test

Possible Alternative Assessments:
- Choice boards - projects
- Skit
- Demonstration
- Journaling
- Conferencing

Suggested Lesson Plan	
Topics	Approximate Timeframe
Topic #1: Equations & Identities	0.5 day
Topic #2: Solving an Equation for a Variable	1.5 days
Topic #3: One Step Equations	2 days
Topic #4: Two Step Equations Suggested Lab: RAFT – Shape up with Algebra	2 days
Topic #5: Multi-Step Equations Suggested Lab: RAFT – Modeling Simple Equations	2 days
Topic #6: Distributing Fractions in Equations	1 day
Topic #7: Writing & Solving Algebraic Equations Lab: RAFT – Dive into Square Pools	3 days
Topic #8: Graphing & Writing Inequalities with One Variable	3 days
Topic #9: Simple Inequalities Involving Addition & Subtraction	1 day
Topic #10: Simple Inequalities involving Multiplication & Division Suggested Lab: Multiplying or Dividing by a Negative Number	2 days
Review & Unit Test	2 days

Materials and Curriculum Resources:

· https://njctl.org/courses/math/7th-grade/

· http://www.raftbayarea.org/ideas/Shape%20Up%20with%20Algebra.pdf

· http://www.raftbayarea.org/ideas/Modeling%20Simple%20Equations.pdf

· http://www.raftbayarea.org/ideas/Dive%20into%20Square%20Pools.pdf

· http://www.kahnacademy.org

· Approved Classroom Textbooks

Lesson Components

21st Century Skills
- Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Themes
- Critical Thinking and Problem Solving
- Communication and Collaboration
- Life and Career Skills
- Information Literacy
- ICT Literacy

Belvidere Cluster Wide
Mathematics Curriculum
7th Grade Advanced
Unit Plan

Title: Equations with Roots and Radicals

Grade Level: 7	**Approximate Length of Time: 2 weeks**

Chapter Summary: This chapter will allow students to evaluate squares and radicals in equations. They will explore how to simplify and approximate square roots to help solve expressions.

Learning Targets

PARCC ■ Major Clusters; ☐ Supporting Clusters; ⭕ Additional Clusters

Domain: Expressions and Equations

Cluster: Expressions and Equations work with radicals and integer exponents.

Standard #s:	**Standards:**
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

Domain: Standards for Math Practice

Standard#:	**Standard:**
MP1	Making sense of problems and persevere in solving them.
MP2	Reason abstractly and quantitatively.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

Chapter Essential Questions:	**Chapter Enduring Understanding:**
● How do radicals and squares help solve real world problems? ● How are radicals and squares useful for solving equations and manipulating numbers?	● Squares and Radicals can help solve real world problems. ● Squares and Radicals affect the numbers that are being used within an operation. ● The rules for radicals can be applied to variable expressions.

Chapter Objectives:
● *Students will be able to use their understanding of square roots to simplify roots of variables.*

- *Students will evaluate square and cube roots of perfect square and cubes to solve equations.*

Evidence of Learning

Possible Formative Assessments:

- SMART Response questions used throughout the chapter.
- Quizzes
- Homework/Classwork
- Labs/Projects
- IXL.com
- tenmarks.com
- firstinmath.com

Summative Assessment:

- Unit Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

- Choice boards - projects
- Skit
- Demonstration
- Journaling
- Conferencing

Suggested Lesson Plan

Topics	Approximate Timeframe
Topic #1: Radical Expressions Containing Variables	1 days
Topic #2: Simplifying Non-Perfect Square Radicands	1.5 days
Topic #3: Simplifying Roots of Variables *Activity: Radical Makeover*	1.5 days
Topic #4: Solving Equations with Perfect Square & Cube Roots	1.5 days
Review and Chapter Test	2 days

Materials and Curriculum Resources:

- http://njctl.org/courses/math/8th-grade-math/
- http://kahnacademy.org
- Approved Classroom Textbooks

Lesson Components

21st Century Skills

- Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Themes

- Critical Thinking and Problem Solving
- Communication and Collaboration
- Life and Career Skills

Belvidere Cluster Wide Mathematics Curriculum 7th Grade Advanced Unit Plan		
Title: Expressions		
Grade Level: 7th Grade		Approximate Length of Time: 3 weeks
Chapter Summary: This chapter will introduce students to different properties expressions can have. They will be able to combine like terms, write expressions when given a verbal phrase, and evaluate both numeric and algebraic expressions.		
Learning Targets		
PARCC ■ Major Clusters; ■ Supporting Clusters; ○ Additional Clusters		
Domain: Number System		
Cluster: Apply and extend previous understandings of operations with fractions.		
Standard #:	Standard:	
7.NS.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. d. Apply properties of operations as strategies to add and subtract rational numbers.	
7.NS.2	Apply and extend previous understandings of multiplication and division to multiply and divide rational numbers. c. Apply properties of operations as strategies to multiply and divide rational numbers	
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.	
Cluster: Use properties of operations to generate equivalent expressions		
Standard #:	Standard:	
7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	
7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how 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."*	
Cluster: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.		
Standard #s:	Standards:	
7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	
Domain: Standards for Math Practice		
Standard#:	**Standard:**	
MP1	Making sense of problems and persevere in solving them.	

MP2	Reason abstractly and quantitatively.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.

Chapter Essential Questions:	Chapter Enduring Understandings:
· What is a numeric expression & how is it evaluated? · What is an algebraic expression & how is it simplified? · How is an algebraic expression evaluated?	· A numeric expression is an expression of numbers and operations. When evaluating them, there is a specific order, called the order of operations. · An algebraic expression is an expression that contains both numbers and variables that is simplified using the distributive property and combining like terms. · An algebraic expression is evaluated using substitution followed by the order of operations.

Chapter Objectives:

- · Students will identify constants, coefficients, and variables in an algebraic expression.
- · Students will evaluate a numerical expression using the correct order of operations.
- · Students will use the distributive property to simplify algebraic expressions.
- · Students will learn to simplify algebraic expressions by combine like terms.
- · Students will translate verbal phrases into mathematical and algebraic expressions.
- · Students will evaluate algebraic expressions when each variable is assigned a value using substitution and the order of operations.

Evidence of Learning

Possible Formative Assessments:

- · SMART Response questions used throughout the chapter.
- · Quizzes
- · Homework/Classwork
- · Q and A
- · Labs/Projects
- · IXL.com
- · tenmarks.com
- · firstinmath.com

Summative Assessment:

- · Unit Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

- ● Choice boards - projects
- ● Skit
- ● Demonstration
- ● Journaling

● Conferencing	

Lesson Plan	
Topics	Approximate Timeframe
Topic #1: Mathematical Expressions	1 day
Topic #2: Order of Operations	2 days
Topic #3: The Distributive Property	2 days
Lab – Comparing Cards Topic #4: Like Terms Suggested Lab – Ordering Combo Meals	3 days
Topic #5: Translating Words into Expressions	2 days
Topic #6: Evaluating Expressions	2 days
Review & Chapter Test	2 days

Materials and Curriculum Resources:

· https://njctl.org/courses/math/7th-grade/
· http://kahnacademy.org
· Approved Classroom Textbooks

Lesson Components

21st Century Skills
● Financial, Economic, Business, and Entrepreneurial Literacy
21st Century Themes
● Critical Thinking and Problem Solving
● Communication and Collaboration
● Life and Career Skills

Belvidere Cluster Wide
Mathematics Curriculum
7th Grade Advanced
Unit Plan

Title: Numbers & Operations

Grade Level: 7th Grade	Approximate Length of Time: 5 weeks

Chapter Summary: This chapter will allow students to further their understanding of the number system. They will explore rational numbers and perform numerous operations using them. They will add, subtract, multiply, and divide rational numbers when solving equations. They will also extend their knowledge of rational numbers to decimals and real world applications.

Learning Targets

PARCC ■ Major Clusters;   ▢ Supporting Clusters;   ◯ Additional Clusters

Domain: The Number System

Cluster: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers

Standard #s:	Standards:
7.NS.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.
7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

Chapter Essential Question:	Chapter Enduring Understandings:
· How do operations affect rational numbers? · How can we use rational numbers to solve real world application problems?	· Previous understanding of operations of numbers can be directly applied to rational numbers. · Rational numbers can be used to solve real word problems.

Chapter Objectives:
- · Students will be applying their prior knowledge of the number system to problems involving rational numbers.
- · Students will be able to add, subtract, multiply and divide rational numbers.
- · Students will transform rational numbers into decimals.
- · Students will solve real world problems using rational numbers.

Evidence of Learning

Possible Formative Assessments:
- · SMART Response questions used throughout the chapter.
- · Quizzes
- · Homework/Classwork
- · Q and A
- · Labs/Projects
- · IXL.com

| · firstinmath.com |
| · tenmarks.com |

| Summative Assessment: |
| ·   Unit Test |

| Benchmark Assessments: |
| Mid and end of unit teacher-created checkpoints |
| Textbook unit test |

| **Possible Alternative Assessments:** |
| ●   Choice boards - projects |
| ●   Skit |
| ●   Demonstration |
| ●   Journaling |
| ●   Conferencing |

| Suggested Lesson Plan ||
Topics	Timeframe
Topic #1: Addition, Natural Numbers & Whole Numbers	0.5 day
Topic #2: Addition Subtraction and Integers Suggested Lab: RAFT – The Absolutely Valuable Game	3.5 days
Topic #3: Addition and Subtraction of Integers	3.5 days
Topic #4: Multiplication and Division of Integers	2.5 days
Topic #5: Operations with Rational Numbers Suggested Lab: RAFT – Fraction Action Game	3 days
Topic #6: Addition and Subtraction of Rational Numbers Suggested Lab: RAFT – Above and Below Zero Game Suggested Lab: RAFT – Graphing Race to the Edge	3.5 days
Topic #7: Multiplication and Division of Rational Numbers	2.5 days
Topic #8: Converting Rational Numbers to Decimals	1.5 days
Topic #9: Exponents	2 days
Topic #10: Real Numbers	0.5 day
Review and Unit Test	2 days

| Materials and Curriculum Resources: |
| ·   https://njctl.org/courses/math/7th-grade/ |
| ·   http://www.raftbayarea.org/ideas/Fraction%20Action%20Game.pdf |
| ·   http://www.raftbayarea.org/ideas/Absolutely%20Valuable%20Game.pdf |
| ·   http://www.raftbayarea.org/ideas/Above%20and%20Below%20Zero%20Game.pdf |
| ·   http://www.raftbayarea.org/ideas/Graphing%20Race%20to%20the%20Edge.pdf |
| ·   http://www.kahnacademy.org |
| ·   Approved Classroom Textbooks |

<table>
<tr><td colspan="2" align="center">**Belvidere Cluster Wide**
Mathematics Curriculum
Grade 7
Unit Plan</td></tr>
</table>

Title: Numbers and Operations

Grade Level: 7	Approximate Length of Time: 3 weeks

Chapter Summary: This chapter starts off reviewing skills learned in 7ᵗʰ grade/ This unit will then allow students to evaluate squares and radicals. They will explore how to simplify and approximate square roots to help solve expressions. The chapter will also introduce different properties of exponents and solving equations using them. These skills will be necessary when solving problems involving Pythagorean Theorem or exponential notations.

<table>
<tr><td colspan="2" align="center">**Learning Targets**</td></tr>
<tr><td colspan="2">PARCC ■ Major Clusters; ☐ Supporting Clusters; ○ Additional Clusters</td></tr>
<tr><td colspan="2">**Domain: The Number System**</td></tr>
<tr><td colspan="2">**Cluster: Know that there are numbers that are not rational, and approximate them by rational numbers.**</td></tr>
</table>

Standard #s:	Standards:
8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).

Domain: Expressions and Equations

Cluster: Expressions and Equations work with radicals and integer exponents.

Standard #s:	Standards:
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

Domain: Standards for Math Practice

Standard#:	Standard:
MP1	Making sense of problems and persevere in solving them.
MP2	Reason abstractly and quantitatively.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

Chapter Essential Question:	Chapter Enduring Understanding:

● What is the difference between rational and irrational numbers?	● Squares and Radicals can help solve real world problems. ● Squares and Radicals affect the numbers that are being used within an operation.

Chapter Objectives:
- *Students will be able to find the squares and square roots of both rational and irrational numbers.*
- *Students will know the perfect squares. They will also be able to simplify perfect square radical expressions as well as non-perfect square radicands.*
- *Students will use the perfect squares to approximate square roots.*
- *Students will understand the properties of exponents and will use them to solve equations with perfect square and cube roots.*

Evidence of Learning

Possible Formative Assessments:
- SMART Response questions used throughout the chapter.
- Quizzes
- Homework/Classwork
- Q and A
- Labs/Projects
- IXL.com
- First in Math
- TenMarks Education

Summative Assessment:
- Chapter Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:
- Choice boards - projects
- Skit
- Demonstration
- Journaling
- Conferencing

Suggested Lesson Plans

Topics	Approximate Timeframe
Presentation Part 1	
Topic #1: Addition, Natural Numbers & Whole Numbers	0.5 day
Topic #2: Addition, Subtraction and Integers	0.5 day
Topic #3: Multiplication and Division of Integers	0.5 day
Topic #4: Operations with Rational Numbers	0.5 day
Topic #5: Converting Repeating Decimals to Fractions	1.5 days
Topic #6: Exponents, Squares, Square Roots and Perfect Squares *Activity: A Penny for Your Thoughts*	1.5 days
Presentation Part 2	
Topic #7: Squares of Numbers Greater than 20	1 day
Topic #8: Simplifying Perfect Square Radical Expressions	1.5 days

Topic #9: Approximating Square Roots *Activity: Root Race*	1.5 days
Topic #10: Rational & Irrational Numbers	1.5 days
Topic #11: Real Numbers	0.5 day
Topic #12: Properties of Exponents *Activity: Laws of Exponents*	2 days
Review and Unit Test	2 days

Materials and Curriculum Resources:

- http://njctl.org/courses/math/8th-grade-math/
- District Approved Textbooks

Lesson Components

21st Century Skills

- Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Themes

- Critical Thinking and Problem Solving
- Communication and Collaboration
- Life and Career Skills

Belvidere Cluster Wide
Mathematics Curriculum
7th Grade Advanced
Chapter Plan

Title: Percents	
Grade Level: 7th Grade	Appoximate Length of Time: 2 weeks

Chapter Summary: This chapter will introduce students to percents. They will learn the different types of percent problems and how to represent the percent equations algebraically. They will also learn how to solve real world application problems involving percents.

Learning Targets

PARCC ■ Major Clusters; ☐ Supporting Clusters; ⬤ Additional Clusters

Domain: Ratios and Proportional Relationships

Cluster: Analyze proportional relationships and use them to solve real-world and mathematical problems.

Standard #:	Standard:
7.RP.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.

Domain: Expressions and Equations

Cluster: Use properties of operations to generate equivalent expressions

Standard # :	Standard:
7.EE.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.

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

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

Chapter Essential Question:	Chapter Enduring Understandings:
· How are percents used to help solve real world application problems? · What are the different ways percent problems are represented?	· Percents are used in real world problems. · Percents can be applied to problems in different ways.

Chapter Objectives:

- · Students will be able to relate fractions, decimals, and percents to each other.
- · Students will solve three different types of percent problems.
- · Students will represent percent equations in an algebraic context.
- · Students will apply percent of increase and percent of decrease when solving problems.

· Students will use their knowledge of percents to help them solve real world problems.
Evidence of Learning

Possible Formative Assessments:

· SMART Response questions used throughout the chapter.
· Quizzes
· Homework/Classwork
· Labs/Projects
· Q and A
· IXL.com
· tenmarks.com
· firstinmath.com
·

Summative Assessment:

· Unit Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

● Choice boards - projects
● Skit
● Demonstration
● Journaling
● Conferencing

Suggested Lesson Plans	
Lessons	Approximate Timeframe
Lesson #1:Relating Fractions, Decimals and Percents	1 days
Lesson #2: Three Types of Percent Problems	2 days
Lesson #3: Percent of Change	1 days
Lesson #4: Representing Percent Equations Algebraically	1 days
Lesson #5: Applied Percent of Decrease	0.5 day
Lesson #6: Applied Percent of Increase	0.5 day
Lesson #7: Real-life Application Problems	2 days
Review & Chapter Test	2 days

Materials and Curriculum Resources:

· https://njctl.org/courses/math/7th-grade/
· http://kahnacademy.org
· Approved Classroom Textbooks

Belvidere Cluster Wide
Mathematics Curriculum
7th Grade Advanced
Unit Plan

Title: Ratios & Proportions

Grade Level: 7th Grade	**Appoximate Length of Time:** 4 weeks

Chapter Summary: This chapter will give students the opportunity to analyze proportional relationships to solve ratios, proportions, and real-world math problems.

Learning Targets

PARCC ■ Major Clusters; □ Supporting Clusters; ○ Additional Clusters

Domain: Ratios and Proportional Relationships

Cluster: Analyze proportional relationships and use them to solve real-world and mathematical problems.

Standard #:	Standard:
7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
7.RP.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.

Domain: Geometry

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

Standard # :	Standard:
7.G.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.

Chapter Essential Questions:	**Chapter Enduring Understandings:**
● How do you recognize and represent proportional relationships between quantities? ● How do you apply proportions?	● Utilize proportional relationships to solve real-world problems.

Chapter Objectives:
- *Students will be able to write ratios for various situations.*
- *Students will be able to determine if ratios are equivalent as well as how to determine an unknown in an equivalent ratio.*
- *Students will be able to calculate unit rates to solve word problems.*
- *Students will use proportions to solve problems.*
- *Students will use proportions to determine the relationship in a table and graph, determine the constant of proportionality, write equations and understand graphs or proportions.*
- *Students will use proportions to solve problems involving scale drawings and similar figures.*

Evidence of Learning

Possible Formative Assessments:
- SMART Response questions used throughout the chapter.
- Quizzes

- Homework/Classwork
- Labs/Projects
- Q and A
- IXL.com
- tenmarks.com
- firstinmath.com

Summative Assessment:

- Unit Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

- Choice boards - projects
- Skit
- Demonstration
- Journaling
- Conferencing

Suggested Lesson Plan	
Topics	**Approximate Timeframe**
Topic #1: Writing Ratios	1 days
Topic #2: Equivalent Ratios	1 days
Topic #3: Rates	2.5 days
Topic #4: Proportions	1.5 days
Topic #5: Direct & Indirect Relationships in Tables and Graphs	1 days
Topic #6: Constant of Proportionality	2 days
Topic #7: Writing Equations for Proportions	1.5 days
Topic #8: Understanding Graphs of Proportions	1 days
Topic #9: Problem Solving	1 days
Topic #10: Scale Drawings Suggested Lab: RAFT – Planet Beads Suggested Lab: RAFT – Sun and Planets to Scale	4 days
Topic #11: Similar Figures Suggested Lab: RAFT – Building it Bigger	2 days
Unit Review and Unit Test	2 days

Materials and Curriculum Resources:

- https://njctl.org/courses/math/7th-grade/
- http://www.raftbayarea.org/ideas/Planet%20Beads.pdf
- http://www.raftbayarea.org/ideas/Sun%20and%20Planets%20to%20Scale.pdf
- http://www.raftbayarea.org/ideas/Building%20it%20Bigger.pdf
- http://www.kahnacademy.org/
- Approved Classroom Textbooks

Title: Scientific Notation

Grade Level: 7	Approximate Length of Time: 2 weeks

Chapter Summary: This chapter will introduce the concept of scientific notation to students. It will demonstrate the purpose of scientific notation and how to write numbers using this form. They will be able to convert numbers between scientific notation and standard form, as well as perform different operations within equations.

Learning Targets	
PARCC ■ Major Clusters; ☐ Supporting Clusters; ○ Additional Clusters	
Domain: Expressions & Equations	
Cluster: Expressions and equations work with radicals and integer exponents.	
Standard #s:	Standards:
8.EE.3	Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Domain: Standards for Math Practice	
Standard#:	**Standard:**
MP1	Making sense of problems and persevere in solving them.
MP2	Reason abstractly and quantitatively.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

Chapter Essential Question:	Chapter Enduring Understanding:
- How will scientific notation help when writing numbers and equations? - How is scientific notation used in real world application problems? - How numbers are compared and manipulated using scientific notation?	- Scientific notation will help demonstrate very large and very small numbers when solving real world application problems. - Numbers can be represented in scientific notation and still be manipulated using operations such as addition, subtraction, multiplication, and division.

Chapter Objectives:
- Students will express numbers using scientific notation.
- Students will recognize the difference between scientific notation and standard form.
- Students will distinguish the difference between different numbers written in scientific notation.
- Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.
-

Evidence of Learning	
Possible Formative Assessments:	
● SMART Response questions used throughout the chapter. ● Quizzes ● Homework/Classwork ● Q and A ● Labs/Projects ● IXL.com ● First in Math ● TenMarks Education	
Summative Assessment: ● Chapter Test	
Benchmark Assessments: Mid and end of unit teacher-created checkpoints Textbook unit test	
Possible Alternative Assessments: ● Choice boards - projects ● Skit ● Demonstration ● Journaling ● Conferencing	

Suggested Lesson Plan	
Topics	**Approximate Timeframes**
Topic #1: Purpose of Scientific Notation Lab: RAFT – One in a Million	1.5 days
Topic #2: How to Write Numbers in Scientific Notation	0.5 day
Topic #3: How to convert between Scientific Notation and Standard Form	1.5 days
Topic #4: Magnitude	1 day
Topic #5: Comparing Numbers in Scientific Notation	1.5 days
Topic #6: Multiply and Divide with Scientific Notation	0.5 day
Topic #7: Addition and Subtraction with Scientific Notation	1.5 days
Review and Unit Test	2 days

Materials and Curriculum Resources:
- https://njctl.org/courses/math/8th-grade-math/
- http://www.raftbayarea.org/ideas/One%20in%20a%20Million.pdf
- District Approved Textbooks

Lesson Components
21st Century Skills
● Financial, Economic, Business, and Entrepreneurial Literacy
21st Century Themes
● Critical Thinking and Problem Solving   ● Communication and Collaboration   ● Life and Career Skills

Belvidere Cluster Wide
Mathematics Curriculum
7th Grade Advanced
Unit Plan

Title: Solving Equations	
Grade Level: 7	Approximate Length of Time: 4 weeks

Chapter Summary: This chapter explores linear equations. Students learn to solve equations starting with a review of inverse operations and two-step equations and progressing to more complex equations. The chapter concludes with using the skills to solve word problems and transforming formulas.

Learning Targets

PARCC ■ Major Clusters;   ☐ Supporting Clusters;   ◯ Additional Clusters + Additional Standard

Domain: Expressions & Equations

Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations.

Standard #s:	Standards:

8.EE.7	Solve linear equations in one variable.
	
	    a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
	
	    b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Domain: Standards for Math Practice

Standard#:	Standard:
MP1	Making sense of problems and persevere in solving them.
MP2	Reason abstractly and quantitatively.
MP3	Construct viable arguments and critique the reasoning of others.
MP4	Model with mathematics.
MP5	Use appropriate tools strategically.
MP6	Attend to precision.
MP7	Look for and make use of structure.
MP8	Look for and express regularity in repeated reasoning.

Chapter Essential Question:	Chapter Enduring Understanding:
● How can the value of an unknown variable be found?	● How to solve an equation in one variable for that variable. · How to translate word problems into an equation.

Chapter Objectives:
- *Students will be able to solve two-step equations.*
- *Students will be able to solve multiple-step equations.*
- *Students will be able to solve equations that contain fractions.*
- *Students will be able to solve equations that contain the same variable on both sides of the equation.*
- *Students will be able to simplify and compare algebraic expressions that contain the same variable.*
- *Students will be able to and translate word problems into equations and solve them.*

Evidence of Learning

Formative Assessments:

· SMART Response questions used throughout the chapter.

· Quizzes

· Homework/Classwork

· Labs/Projects

· IXL.com

· firstinmath.com

· tenmarks.com

Summative Assessment:

· Unit Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

● Choice boards - projects
● Skit
● Demonstration
● Journaling
● Conferencing

Suggestd Lesson Plan	
Topics	Approximate Timeframe
Topic 1: Review of Two-Step Equations	1 day
Topic 2: Multi Step Equations	2 days
Topic 3: Solving Equations that Contain Fractions	2 days
Topic 4: Equations with the Same Variable on Both Sides	2 days
Topic 5: Comparing Expressions with the Same Variable	1 day
Topic 6: Writing & Solving Algebraic Equations	2 days
Topic 7: Translating and Solving Consecutive Integer Problems	2 days
Suggested Lab: RAFT – Occasions for an Equation	2 days
Topic 8: Transforming Formulas	2 days
Review and Chapter Test	2 days

Materials and Curriculum Resources:

· https://njctl.org/courses/math/8th-grade-math/

· http://www.raftbayarea.org/ideas/Occasions%20for%20an%20Equation.pdf

· http://www.kahnacademy.org

· Approved Classroom Textbooks

Lesson Components

21st Century Skills

● Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Themes

● Critical Thinking and Problem Solving
● Communication and Collaboration
● Life and Career Skills

<table>
<tr><td colspan="2" align="center">Belvidere Cluster Wide
Mathematics Curriculum
7th Grade Advanced
Unit Plan</td></tr>
<tr><td colspan="2">Title: Statistics & Probability</td></tr>
<tr><td>Grade Level: 7th Grade</td><td>Approximate Length of Time: 4 weeks</td></tr>
<tr><td colspan="2">Chapter Summary: This chapter will introduce students to the concept of solving problems that involve different types of events. They will examine sampling, compare two populations, and distinguish properties of events. Permutations, combinations, and probability will be learned to help solve problems. The fundamental counting principle will also be utilized throughout the chapter. Students will also work with statistical measures.</td></tr>
<tr><td colspan="2" align="center">Learning Targets</td></tr>
<tr><td colspan="2">PARCC ■ Major Clusters; □ Supporting Clusters; ○ Additional Clusters</td></tr>
<tr><td colspan="2">Domain: Statistics and Probability</td></tr>
<tr><td colspan="2">Cluster: Use random sampling to draw inferences about a population.</td></tr>
<tr><td>Standard #s:</td><td>Standards:</td></tr>
<tr><td>7.SP.1</td><td>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</td></tr>
<tr><td>7.SP.2</td><td>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.</td></tr>
<tr><td colspan="2">Cluster: Draw informal comparative inferences about two populations.</td></tr>
<tr><td>Standard #s :</td><td>Standards:</td></tr>
<tr><td>7.SP.3</td><td>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.</td></tr>
<tr><td>7.SP.4</td><td>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</td></tr>
<tr><td colspan="2">Cluster: Investigate chance processes and develop, use, and evaluate probability models.</td></tr>
</table>

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

Chapter Essential Questions:	Chapter Enduring Understandings:
· How does probability relate to real world application problems? · How can measures of center and variation be used to compare two sets of data? · How are different events classified and what can I use to solve them?	· Events are classified into different types. This determines the route to solving the problem. · Probability, measures of center, and measures of variation all are used to help solve real world application problems.

Chapter Objectives:

- Students will be introduced to the concept of sampling.

- Students will be able to draw inferences about a population based off a sample.

- Students will be able to compare two populations and solve real world application problems with them.

- *Students will be able to measure the difference between the centers by expressing it as a multiple of a measure of variability.*

- *Students will understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.*

- Students will be able to use experimental and theoretical probability to determine the likelihood of an event occurring.

- Students will use the fundamental counting principle to solve problems.

- *Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation*

Evidence of Learning

Possible Formative Assessments:

· SMART Response questions used throughout the chapter.
· Quizzes
· Homework/Classwork
· Labs/Projects
· Q and A
· IXL.com
· tenmarks.com
· firstinmath.com

Summative Assessment:

· Unit Test

Benchmark Assessments:

Mid and end of unit teacher-created checkpoints

Textbook unit test

Possible Alternative Assessments:

● Choice boards - projects
● Skit
● Demonstration
● Journaling
● Conferencing

Suggested Lesson Plan	
Topics	Approximate Time frame

Topic #1:Introduction to Probability	1 days
Topic #2:Experimental and Theoretical	2 days
Topic #3:Sampling Suggested Lab: RAFT – Ample Samples	3 days
Topic #4:Word Problems	2 days
Topic #5:Probability of Compound Events Suggested Lab: RAFT – Adventures in Probability Suggested Lab: RAFT – Monty Hall Makes a Deal	4 days
Topic #6:Measures of Center	2 days
Topic #7:Measures of Variation	2 days
Topic #8:Mean Absolute Deviation	2 days
Review & Unit Test	2 days

Materials and Curriculum Resources:

· https://njctl.org/courses/math/7th-grade/
· http://www.raftbayarea.org/ideas/Ample%20Samples.pdf
· http://www.raftbayarea.org/ideas/Adventures%20in%20Probability.pdf
· http://www.raftbayarea.org/ideas/Monty%20Hall%20Makes%20a%20Deal.pdf
· http://www.kahnacademy.org
· Approved Classroom Textbooks