

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Concept Focus Unit	Domains/Standards	Time
Unit 1: <u>Proportional Reasoning</u>	SMP: 2,5,6 7.RP.1, 7.NS.2-d,3, 7.EE4-a,7.G.1	11 days
Unit 2: <u>Proportional Relationships</u>	SMP: 4,6,8 7.RP2 a-d	12 days
Unit 3: <u>Proportional Relationships with Percent</u>	SMP: 1,2,5 7.RP3,7.EE3	10 days
Unit 4: <u>Rational Number operations – Addition/Subtraction</u>	SMP: 1,6,7 7.NS.1 a-d, 7.NS3, 7.EE.3	12 days
Unit 5: <u>Rational Number Operations- Multiplication/Division</u>	SMP: 1,6,7 7.NS.2 a-c,7.NS.3, 7.EE.3	9 days
Unit 6: <u>Solving Equations</u>	SMP: 1,2,4,7 7.EE.1,7.EE.2,7.EE.4-a,c	13 days
Unit 7: <u>Solving Equations and Inequalities</u>	SMP: 1,2,4,7 7.EE.4 a-b	11 days
Unit 8: <u>Probability of Simple Events</u>	SMP: 3,4 7.SP.5,7.SP6,7.SP/7 a-b,7.RP.3	12 days
Unit 9: <u>Probability of Compound Events</u>	SMP: 4,5,6 7.SP8 a-c,7.RP3	11 days
Unit 10: <u>Sampling, Inferences, and Comparing Populations</u>	SMP: 3,4,6 7.SP.1,7.SP.2, 7.SP3, 7.SP.4,	12 days
Unit 11: <u>Scale Drawings</u>	SMP: 4,6,8 7.G.1	12 days
Unit 12: <u>Geometric Constructions</u>	SMP: 3,5,7 7.G.2, 7.G.5	11 days
Unit 13: <u>2-D figures</u>	SMP: 1,2,7,8 7.G.4, 7.G.6	12 days
Unit 14: <u>3-D figures</u>	SMP: 4,5,7 7.G3,7.G.6	12days
PARCC testing: Performance Based Assessment (PBA): March 16-April 10 computer-based; March 23 – April 3 paper-based End of Year assessment (EOY): May 4 – 29 computer-based; May 11 – 22 paper-based		
Review and Extend	All standards	May/June
Final Assessment	All standards	June

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7

New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

This NBPS Math Curriculum map reflects the MA 2011 Mathematics Curriculum Frameworks and is aligned to the Common Core State Standards for mathematical content as well as the following eight standards of Mathematical practice.

Standards for Mathematical Practice (SMP)

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.

The Standards for Mathematical Practice (SMP) will need to be an integral part of mathematical instruction. In grades 6-8, each instructional unit will highlight suggested standards of mathematical practice to focus on for that unit. Teachers are encouraged to use any standards of math practice that are appropriate for any given lesson but the assessment for that unit will incorporate the focus SMP for that unit. In this way, teachers will assure that each of the 8 SMP will be a focus in several units throughout the year.

WIDA English Language Development standard 3 - The Language of Mathematics

English language learners **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics**.

Unit plans will include specific Performance Indicators (PI) and performance tasks and lesson plans will need to include specific language objectives appropriate to the content and ELD level of students.

Listed below are important and useful resources available on the Internet for teachers. Please add appropriate online resources as needed.

Website:	Notes:
www.ati-online.com (select Galileo K-12)	Each teacher will receive access information to the Galileo K-12 program, which will be used for district math assessments and intervention options. Common unit assessments, district benchmark assessments, assessment analysis reports, instructional dialogs (instructional supports), and student histories will be available to support standards-based instruction in mathematics.
http://katm.org/wp/?page_id=91	Grade level “flip books” with suggestions for integration of Standards for Math Practice for each standard, explanation of the content standard, instructional strategy recommendations, student misconceptions to address, etc. Developed with NC, Ohio, and Arizona departments of education.
www.parcconline.org	Implementation of the common core guidelines for gr. 3-8 and HS. This guide was used for reference as the district math curriculum maps were revised.
www.khanacademy.org	Khan Academy is a website with a library of over 3000 educational video clips. The mathematics videos explain important topics and concepts in mathematics.
www.wida.us	WIDA standards for ELL students include specific standards for content areas such as math. This website has a downloadable library of resources for teachers.

Grade 7

New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 1: Proportional Reasoning	Suggested number of days: 11
<p>In this unit, students investigate and solve problems involving rates. As part of this work, students apply positive rational number operations to write and solve equations of the form $px + q = r$ and $p(x + q) = r$ in which $q = 0$ (i.e., 1- step equations), thereby reinforcing their grade 6 work in writing and solving equations (6.EE.7)</p> <p><u>Comments:</u></p> <ul style="list-style-type: none"> In this unit, all work with 7.NS.3 focuses on positive rational numbers, including positive complex fractions. Negative rational numbers will be addressed in units 4-7. 7.RP.1 and 7.NS.3 are closely connected because they both deal with complex fractions. Since every ratio has an associated unit rate, this is an appropriate place to include conversion of rational numbers to decimals (7.NS.2d); for example 2miles in three hours can be expressed by the decimal 0.6 repeating The equations (7.EE.4a) in this unit are strictly one-step. Students solve multi-step equations in units 6 and 7. Students will solve problems leading to inequalities in unit 7. Work with scale drawings (7.G.1) should be included as an instance of proportional reasoning. Since area relationships in scale drawings are not proportional, they will be addressed in unit 13. 	
State Standards	Suggested Resources:
<i>Cluster Heading: Analyze proportional relationships and use them to solve real-world and mathematical problems.</i>	
<p>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. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.</p> <ul style="list-style-type: none"> Create appropriate ratios to find unit rates in various contexts. Apply the adjective/noun theme for division to compute unit rates, i.e., 10 miles/ 2 hours is found by dividing the adjectives $10/2$ and dividing the nouns (units) miles/hour (mph) Use simplification strategies such as multiplying by a selected form of one to simplify complex fractions, i.e., $\frac{1/2}{1/4} \times \frac{4}{4} = \frac{1/2 \times 4}{1} = 2 \text{ miles/hours}$ 	<p>MA Model Curriculum Unit: Proportions and Proportional Reasoning</p> <p>Glencoe: Ch. 1: Lessons and Assessments</p> <p>CMP: Common Core Investigations: Inv. 1.1 CMP: <u>Comparing and Scaling</u> Inv. 3.1, 3.2, 3.3</p> <p>PH: 5.1, 5.2</p>
Cluster heading: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers	
<p>7.NS.2d 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</p> <ul style="list-style-type: none"> Explain why a number is rational – a number that can be written as a ratio of whole numbers. Determine the decimal form of fractions through long division until the decimal terminates in zeroes or repeats. 	<p>PH: 3.9</p>
<p>7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers. (Note: Computations with rational numbers extend the rules for manipulating fractions to complex fractions – $1/2 / 1/4$)</p> <ul style="list-style-type: none"> Read and solve word problems that involve real life situations using the four operations, their properties and order of operations for rational numbers including complex fractions. Students need to be familiar with various types of problem situations. See this map Appendix for table 1 and table 2 from MA 2011 Math Curriculum Frameworks. 	<p>CMP: ACE Extension questions from <u>Accentuate the Negative</u></p> <p>PH: 1.5, 4.7, 7.6, 11.4</p>

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 1: Proportional Reasoning (continued)	Suggested number of days: 11
State Standards	Suggested Resources
<i>Cluster Heading: Solve real-world and mathematical problems using numerical and algebraic expressions and equations.</i>	
<p>7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equation and inequalities to solve problems by reasoning about the quantities.</p> <p>❖ 7.EE.4a 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?</p> <ul style="list-style-type: none"> • Apply the order of operations to simplify expressions in an equation • Apply the distributive property to simplify expressions in an equation • Translate word problems into equations that can be solved to find the variable. <p>See Map Appendix: Table 3 Properties of Operations, Table 4 Properties of Equality</p>	<p>MA Model Curriculum Unit: Proportions and Proportional Reasoning</p> <p>Glencoe: Ch. 1: Lessons and Assessments</p> <p>CMP: Common Core Investigations: 1.1</p> <p>CMP: Variables and Patterns-Inv. 1 Moving Straight Ahead-Inv. 1</p> <p>PH: 1.9</p>
<i>Cluster Heading: Draw, construct, and describe geometrical figures and describe the relationships between them.</i>	
<p>7.G.1 Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p> <ul style="list-style-type: none"> • Given the scale on a map or diagram, compute the actual lengths and use these measurements to calculate the area. 	<p>CMP: Comparing and Scaling: Inv. 4 Stretching and Shrinking: Inv.1, 2</p>

Standards for Mathematical Practice – Unit 1	<p>In this unit, students will use appropriate tools (tables, graphs, equations, and verbal descriptions) strategically (SMP.5) to solve problems dealing with proportional reasoning. They also attend to precision (SMP.6) and reason abstractly and quantitatively (SMP2) as they write and solve 1-step equations.</p>
2. Reason abstractly and quantitatively	
5. Use appropriate tools strategically.	
6. Attend to precision.	

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 2: Proportional Relationships	Suggested number of days: 12
The standards in this unit are a critical area for this grade. They build on the work of the previous unit to reinforce and formalize understandings of proportional relationships. The unit also builds foundational understandings for slope that will be formalized in grade 8.	
State Standards	Suggested Resources
<i>Cluster Heading:</i> Analyze proportional relationships and use them to solve real-world and mathematical problems.	
7.RP.2 Recognize and represent proportional relationships between quantities.	
❖ 7.RP.2a 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.	MA Model Curriculum Unit: <i>Proportions and Proportional Reasoning</i> Glencoe: Ch. 1: Lessons and Assessments CMP: Common Core Investigations: 1.1, 1.2 PH: 5.4, 5.5
Test if ratios are equivalent and can form a proportion Represent information in a table or graph to determine if the quantities are in a proportional relationship. Recognize that a line through the origin is a representation of a direct variation which is proportional	
❖ 7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	PH: 5.6, 5.7, 7.9 CMP: <u>Comparing and Scaling</u> Inv. 3.4 <u>Stretching and Shrinking</u> Inv. 2.1,2.2, 3.3 Algebra Four block templates
Given various representations of proportional relationships, identify the constant of proportionality. For example, in a table identify the rule, on a graph find the rate of change as reflected in the change to the quantities, in an equation find the constant of proportionality as the coefficient of the input or independent variable, etc. Extend and analyze patterns using graphs, words, tables, symbolic expressions	
❖ 7.RP.2c 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 $t = pn$.	PH: 6.6,6.7 CMP: Common Core Inv. 1.2
Create equations to represent proportional relationships of the form $y = mx$	
7.RP.2d 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.	CMP: Common Core Inv. 1.1 PH: 10.2,10.3
Explain the meaning of a coordinate (x,y) in the context of the graph, i.e., $(1, 8)$ means \$ 8 earned for 1 hr. of work. Recognize that the coordinate $(1,r)$ identifies the unit rate because r – the y value at $x=1$ represents the rate of change or constant of proportionality.	

Standards for Mathematical Practice – Unit 2	Students model with mathematics (SMP.4) and attend to precision (SMP.6) as they look for and express repeated reasoning (SMP.8) by generating various representations of proportional relationships and use those representations to identify and describe constants of proportionality.
1. Make sense of problems and persevere in solving them.	
6. Attend to precision.	
7. Look for and make use of structure.	

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 3: Proportional Relationships with Percent	Suggested number of days: 10
This unit builds on the previous unit as it extend student’ understanding of ration and rate reasoning to percents. Students also write and solve 1-step equations as part of their work with percents; for example, the question “ If Kevin paid a total of \$13.50, including 8% sales tax, what was the original price of the item he purchased?” can be represented by the equation $1.08x = \$13.50$	
State Standards	Suggested Resources
<i>Cluster Heading: Analyze proportional relationships and use them to solve real-world and mathematical problems.</i>	
7.RP.3 Use proportional relationships to solve multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	MA Model Curriculum Unit: <i>Proportions and Proportional Reasoning</i> Glencoe: Ch. 2 and 3: Lessons and Assessments CMP: Common Core Investigations: PH: 6.1,6.4,6.5
<ul style="list-style-type: none"> • Recognize when a problem context represents a proportional relationship • Solve percent problems by using proportions • Solve problems involving simple interest, finding tax, markups and mark downs, gratuities and commissions, fees, percent increase, percent decrease and percent of error. 	
<i>Cluster Heading: Solve real-world and mathematical problems using numerical and algebraic expressions and equations.</i>	
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 $9\frac{3}{4}$ 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.	PH: 2.5, 2.6 CMP: <u>Variables and Patterns</u> Inv. 2,3,4 <u>Moving Straight Ahead</u> Inv. 2.1 – 2.3, 3.1-3.4,4.1-4.3 See Map Appendix: Table 3 Properties of Operations, Table 4 Properties of Equality
<ul style="list-style-type: none"> • Convert between forms as appropriate, e.g., $\frac{1}{4}$ off the price is the same as multiplying the price by .25. 	

Standards of Mathematical Practice – Unit 3	The content standards in this unit specify that students use tools strategically (SMP.5) as they solve multi-step real-life mathematical problems (SMP.1) using numerical and algebraic expressions (SMP.2)
1. Make sense of problems and persevere in solving them.	
2. Reason abstractly and quantitatively.	
5. Use appropriate tools strategically.	

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 4: Rational Number Operations – Addition and Subtraction	Suggested number of days: 12
<p>The purpose of this unit is to provide an opportunity for students to reinforce and extend their understanding of addition and subtraction with rational numbers. It builds on students’ solid understanding of integers, other rational numbers, and absolute value as described in (6.NS.) Positive and negative fractions, decimals, and whole numbers should be included in this unit.</p> <p><u>Comments:</u></p> <ul style="list-style-type: none"> • Work with 7.NS.3 should focus on addition and subtraction of positive and negative rational numbers. • In this unit, 7.EE.3 will focus on problem situations involving addition and subtraction of rational numbers. Problems involving multiplication and division will be addressed in unit 5. 	
State Standards	Suggested Resources
<i>Cluster heading: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers</i>	
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.	
<ul style="list-style-type: none"> • Represent addition and subtraction on a vertical number line, i.e., temperature change on a thermometer • Represent addition and subtraction on a horizontal number line. 	<p>Glencoe: Chapters 3 and 4: Lessons and Assessments CMP: Common Core Investigations: CMP: <u>Accentuate the Negative</u> Inv. 1.1 -1.4, 2.1- 2.3 ACE questions See Teacher’s Edition for ACE questions PH: 1.6, 1.7</p>
<p>❖ 7.NS.1a Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</p> <ul style="list-style-type: none"> • Describe real world situations that can be represented with integers to represent opposite quantities that equal zero. For example, credit and debt , gain and loss, or above and below sea level, 	
<p>7.NS.1b 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.</p> <ul style="list-style-type: none"> • Show addition of two integers $p + q$ on a number line. Explain the absolute value of an integer as the distance from 0 on a number line. • Identify the additive inverse (opposite) of an integer. • Recognize opposites on a number line as being integers that are the same distance from zero on a number line, i.e., -3 and 3. • Show that a number and its opposite have a sum of zero (explain the additive inverses) • Interpret sums of rational numbers in real world contexts that use integers. 	
<p>7.NS.1c. 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.</p> <ul style="list-style-type: none"> • Explain subtraction as the opposite of addition. • Show that the distance between any 2 integers is the same as the absolute value of the difference between them on a number line. • Describe real world situations that use subtraction of rational numbers, i.e., finding length of time from one date BC to another date AD. 	

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 4: Rational Number Operations – Addition and Subtraction - continued	Suggested number of days: 12
State Standards	Suggested Resources
Cluster heading: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers	
❖ 7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers. <ul style="list-style-type: none"> • Zero property of addition ($-4 + 0 = -4$) • Additive inverse ($-4 + 4 = 0$) • Associative property of addition ($6 + -2 + -3 = 6 + (-2 + -3)$) • Commutative property of addition $6 + -2 + -4 = 6 + (-2 + -4)$ 	Glencoe: Chapters 3 and 4: Lessons and Assessments CMP: Common Core Investigations CMP: <u>Accentuate the Negative</u> Inv. 2.4 ACE questions PH: 1.2,3.10, 4.3
7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers <ul style="list-style-type: none"> • Read and solve word problems that involve real life situations using the four operations, their properties and order of operations. Note: Students need to be familiar with various types of problem situations. **	PH: 1.5, 4.7, 7.6, 11.4 **See this map Appendix for table 1 and table 2 from MA 2011 Math Curriculum Frameworks.
Cluster Heading: Solve real-world and mathematical problems using numerical and algebraic expressions and equations.	
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 $9\frac{3}{4}$ 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. <ul style="list-style-type: none"> • Write and evaluate expressions with 2 operations using rational numbers 	PH: 2.5, 2.6 CMP: <u>Variables and Patterns</u> Inv. 2,3,4 <u>Moving Straight Ahead</u> Inv. 2.1 – 2.3, 3.1-3.4, 4.1-4.3 See Map Appendix: Table 3 Properties of Operations, Table 4 Properties of Equality

Standards of Mathematical Practice – Unit 4	Looking for and making use of structure (SMP.7) aids students’ understanding of addition and subtraction of positive and negative rational numbers. Students also engage in SMP.1 and SMP.6 in order to solve the multi-step problems presented in this unit.
1. Make sense of problems and persevere in solving them.	
6. Attend to precision	
7. Look for and make use of structure.	

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7

New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 5: Rational Number Operations – multiplication and division	Suggested number of days: 9
<p>The purpose of this unit is to provide students an opportunity to reinforce and extend their understanding of multiplication and division with rational numbers. Problems addressed in this unit will focus on multiplication and division, but may also incorporate addition and subtraction. By the end of this unit, students should be comfortable applying all four operations to positive and negative fractions and decimals.</p> <p><u>Comments:</u></p> <ul style="list-style-type: none"> When addressing 7.NS.2a, note that students already know the distributive property from earlier grades. It was first introduced in grade 3. In grade 6, students applied the distributive property to generate equivalent expressions and involving both numbers and variables (6.EE.3) In this unit, 7.EE.3 will focus on problem situations involving all four operations with rational numbers. Work with 7.NS3 should focus on all four operations with positive and negative rational numbers. 	
State Standards	Suggested Resources
Cluster heading: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers	
7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	<p>Glencoe: Chapters 3 and 4: Lessons and Assessments CMP: Common Core Investigations PH: 1.3 CMP: Accentuate the Negative Inv. 3.1, 3.2, 3.4 ACE questions</p>
<p>❖ 7.NS.2a 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.</p>	
<p style="text-align: center;">Distributive Property ($3(2 + -3) = (3 \times 2) + (3 \times -3)$) Use visual models to represent distributive property, i.e., area model:</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;"> $3 \begin{array}{ c c } \hline 2 & +1/3 \\ \hline \end{array}$ </div> <div> $3(2 + 1/3) = (3 \times 2) + (3 \times 1/3) = 6 + 1 = 7$ </div> </div>	
<p>❖ 7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p>	<p>PH: 3.3 CMP: Accentuate the Negative Inv. 3.3 ACE questions</p>
<p>❖ 7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p> <ul style="list-style-type: none"> See Map Appendix – Table 3 Properties of Operations for a list of properties 	<p>PH: 3.4, 3.5, 4.4, 4.5 CMP: Accentuate the Negative Inv. 4.1, 4.2, 4.3 ACE questions</p>
<p>7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers. Note: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.</p>	<p>PH: 1.5, 4.7, 7.6, 11.4 CMP: ACE Extension questions from <u>Accentuate the Negative</u></p>
<ul style="list-style-type: none"> Read and solve word problems that involve real life situations using the four operations, their properties and order of operations. <p>Students need to be familiar with various types of problem situations. See this map Appendix for table 1 and table 2 from MA 2011 Math Curriculum Frameworks.</p>	

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 5: Rational Number Operations – multiplication and division - continued	Suggested number of days: 9
State Standards	Suggested Resources
<i>Cluster Heading: Solve real-world and mathematical problems using numerical and algebraic expressions and equations.</i>	
<p>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 $9\frac{3}{4}$ 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.</p> <ul style="list-style-type: none"> • Given a mixed number students can correctly find the equivalent improper fraction of decimal and use various forms as needed to calculate to solve a problem. • Assess the reasonableness of computation answers by translating between various forms using mental computation and estimation strategies. 	<p>Glencoe: Chapters 3 and 4: Lessons and Assessments CMP: <u>Common Core Investigations</u></p> <p>CMP: <u>Variables and Patterns</u> Inv. 2,3,4 <u>Moving Straight Ahead</u> Inv. 2.1 – 2.3, 3.1-3.4, 4.1-4.3</p> <p>PH: 2.5, 2.6</p> <p>See Map Appendix: Table 3 Properties of Operations, Table 4 Properties of Equality</p>

Standards of Mathematical Practice – Unit 5	
1. Make sense of problems and persevere in solving them.	Students solve real-life problems (SMP.1) by modeling them with algebraic equations (SMP.4). In manipulating these equations to generate equivalent expressions, they also reason abstractly and quantitatively (SMP.2) and look for and make use of structure (SMP.7).
2. Reason abstractly and quantitatively	
4. Model with Mathematics	
7. Look for and make use of structure.	

Grade 7

New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 6: Solving Equations	Suggested number of days: 13
<p>The purpose of this unit is to ensure that students have a strong foundation in manipulating and solving algebraic expressions and equations. This unit builds on the work within the Expressions and Equations domain in Grade.6</p> <ul style="list-style-type: none"> Students have had prior experience in generating equivalent expressions; they should be working toward fluency in solving equations with 7.EE.1 in this unit From their experience in prior units and grades, students already solve one-step equations fluently. In this unit, they are expected to build fluency with writing and solving multi-step equations (7.EE.4a). Inequalities will be explored in unit 7. 	
State Standards	Suggested Resources
Cluster heading: Use properties of operations to generate equivalent expressions	
<p>7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</p> <ul style="list-style-type: none"> See Map Appendix: Table 3 Properties of Operations 	<p>Glencoe: Ch. 5: Lessons and Assessments</p> <p>CMP: <u>Common Core Investigations</u> 2.1, 2.2 Ex 1 - 23</p> <p>PH:</p> <p>Suggested website: Grade 7 Flipbook http://katm.org/wp/?page_id=91 for</p>
<p>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.”</p> <ul style="list-style-type: none"> Rewrite expressions in different forms as appropriate, e.g. !0% decrease to “multiply by .90” (1.00 -.10) 	
Cluster Heading: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
<p>7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equation and inequalities to solve problems by reasoning about the quantities.</p> <p>❖ 7.EE.4a 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?</p> <ul style="list-style-type: none"> Apply the order of operations to simplify expressions in an equation Apply the distributive property to simplify expressions in an equation Translate word problems into equations that can be solved to find the variable. <p>❖ MA 7.EE.4c Extend analysis of patterns to include analyzing, extending, and determining an expression for simple arithmetic and geometric sequences (e.g., compounding, increasing area), using tables, graphs, words, and expressions.</p> <ul style="list-style-type: none"> Extend and analyze patterns. Analyze relationships to determine if the sequence is arithmetic (addition/subtraction pattern). Identify a pattern that involves a geometric pattern (compounding, increasing area). For example compounding interest of 5% - 1.05^x x initial amount. Represent patterns in various forms using tables, graphs, words, and expressions. 	<p>PH: 1.9 2.1, 2.3, 3.1</p> <p>CMP: <u>V, ariables and Patterns</u> Inv. 1 <u>Moving Straight Ahead</u> Inv. 1</p> <p>See Map Appendix: Table 3 Properties of Operations, Table 4 Properties of Equality</p> <p>Algebra Four-block template is suggested support)</p>

Unit 6 – Solving Equations continued.....

Grade 7

New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 6 – Solving Equations continued.....

Standards of Mathematical Practice – Unit 6	Students solve real-life problems (SMP.1) by modeling them with algebraic equations (SMP.4). In manipulating these equations to generate equivalent expressions, they also reason abstractly and quantitatively (SMP.2) and look for and make use of structure (SMP.7)
1. Make sense of problems and persevere in solving them.	
2. Reason abstractly and quantitatively.	
4. Model with mathematics.	
7. Look for and make use of structure.	

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 7: Solving Equations and Inequalities	Suggested number of days: 11
<p>In this unit, students extend their understanding of equations to include inequalities. Students reinforce their previous learning about solving equations as they learn to solve inequalities.</p> <ul style="list-style-type: none"> In this unit, they are expected to continue to build fluency with writing and solving multi-step equations (7.EE.4) and they extend those understandings to investigate solving word problems leading to inequalities. 	
State Standards	Suggested Resources
<p><i>Cluster Heading:</i> Solve real-world and mathematical problems using numerical and algebraic expressions and equations.</p>	
<p>7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equation and inequalities to solve problems by reasoning about the quantities.</p>	
<p>❖ 7.EE.4a 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?</p> <ul style="list-style-type: none"> Apply the order of operations to simplify expressions in an equation Apply the distributive property to simplify expressions in an equation Translate word problems into equations that can be solved to find the variable. 	<p>Glencoe: Ch. 6: Lessons and Assessments CMP: Common Core Investigations CMP: Variables and Patterns: Investigations 1,2, 3, 4 <u>Moving Straight Ahead:</u> Inv. 1,2.1 – 2.3, 3.1-3.4,4.1-4.3</p> <p>PH: 1.9, 2.8, 2.9, 2.10</p> <p>See Map Appendix:</p> <ul style="list-style-type: none"> Table 3 Properties of Operations, Table 4 Properties of Equality Table 5 –Properties of Inequality, Algebra Four-block template
<p>❖ 7.EE.4b 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.</p>	
<p>Translate word problems into inequalities Solve multi-step inequalities. Graph inequalities and interpret the results in the context of the problem</p>	

Unit 7: Solving Equations and Inequalities continued.....

Standards of Mathematical Practice – Unit 7	
1. Make sense of problems and persevere in solving them.	<p>As with unit 6, students solve real-life problems (SMP.1) by modeling them with algebraic inequalities (SMP.4). In manipulating these equations and inequalities to generate equivalent expressions, they also reason abstractly and quantitatively (SMP.2) and look for and make use of structure (SMP.7)</p>
2. Reason abstractly and quantitatively.	
4. Model with mathematics.	
7. Look for and make use of structure.	

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7

New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 8: Probability of Simple Events	Suggested number of days: 12
<p>Students in grade 7 have not previously encountered probability. This unit focuses on the foundational understanding related to simple probability (e.g. chance, randomness, relative frequency, probability models).</p> <ul style="list-style-type: none"> 7.RP.3 is repeated in this unit because of the strong application of percents in this unit. In this unit, 7.SP.5, 7.SP.6, and 7.SP.7 are investigated with simple events only. In unit 9, students will apply these concepts and skills with compound events. 	
State Standards	Suggested Resources
<p><i>Cluster heading: Investigate chance processes and develop, use, and evaluate probability models.</i></p>	
<p>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 $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</p> <ul style="list-style-type: none"> Probabilities are given as a % or as a fraction between 0 and 1, i.e., 0 – 100% or a fraction between 0 and 1 Relate likelihood to the % or fraction, which gives the probability of an event occurring. 	<p>Glencoe: Ch. 9: Lessons and Assessments CMP: <u>Common Core Investigations</u></p> <p>PH: 11.6, 12.1 CMP: <u>What Do You Expect?</u> Investigations 1.1, 1.2, 2.1,2.3</p> <p>Suggested Websites: National Library of Virtual Manipulatives – http://nlvm.usu.edu, Gr. 7 Flipbook http://katm.org/wp/?page_id=91, www.khanacademy.org .</p>
<p>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. <i>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.</i></p> <ul style="list-style-type: none"> Approximate the probability of an event occurring and predict the approximate relative frequency. 	
<p>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 discrepancy.</p> <ul style="list-style-type: none"> ❖ 7.SP.7a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. <i>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.</i> ❖ 7.SP.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. <i>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?</i> 	
<ul style="list-style-type: none"> Use spinners, number cubes, pennies, or other manipulatives to create a probability model. 	

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 8: Probability of Simple Events - continued	Suggested number of days: 12
State Standards	Suggested Resources
<i>Cluster Heading: Analyze proportional relationships and use them to solve real-world and mathematical problems.</i>	
7.RP.3 Use proportional relationships to solve multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	Glencoe: Ch. 9: Lessons and Assessments CMP: <u>Common Core Investigations</u> PH: 6.1,6.4,6.5 more percent examples will be needed Suggested website: http://katm.org/wp/?page_id=91 for Grade 7 Flipbook
<ul style="list-style-type: none"> • Recognize when a problem context represents a proportional relationship • Solve percent problems by using proportions; e.g., if there is a 50% chance of flipping a coin and landing on the tail side, how many times might you predict you will land on a tail if you flip the coin 10 times? • Solve problems involving simple interest, finding tax, markups and mark downs, gratuities and commissions, fees, percent increase, percent decrease and percent of error. 	

Standards of Mathematical Practice - Unit 8	In this unit, students engage in developing probability models and thereby engage in SMP.4 . For many probability situations, more than one model may be developed and applied to answer real-world questions; therefore, students construct viable arguments and critique the reasoning of others (SMP.3).
3. Construct viable arguments and critique the reasoning of others.	
4. Model with mathematics.	

Grade 7

New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 9: Probability of Compound Events	Suggested number of days: 11															
<p>This unit supports continued work with 7.SP.5, 7.SP.6, 7.SP.7 as students extend their understanding of probability to include compound events.</p> <ul style="list-style-type: none"> • 7.RP.3 is repeated in this unit because of the strong application of percents in probability. 																
State Standards	Suggested Resources															
Cluster heading: Investigate chance processes and develop, use, and evaluate probability models.																
7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.																
<p>Create an organized list, table or tree diagram to show all possible outcomes of an event. Use a simulation to test the experimental probability of an event or compound events. Use the area model to represent compound events, e. g. use an area model to show the probability of getting a three on a spinner with 1, 2 and 3 and getting a head if I spin once and flip a coin once.</p> <p>Probability of spinning a 3 → (across the top) Probability of flipping a coin and getting heads ↓ (down the side)</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center; padding: 0 10px;">1</td> <td style="text-align: center; padding: 0 10px;">2</td> <td style="text-align: center; padding: 0 10px;">3</td> <td></td> </tr> <tr> <td style="padding-right: 10px;">Heads</td> <td style="border: 1px solid black; width: 40px; height: 20px;"></td> <td style="border: 1px solid black; width: 40px; height: 20px;"></td> <td style="border: 1px solid black; width: 40px; height: 20px; text-align: center;">Heads 3</td> <td></td> </tr> <tr> <td style="padding-right: 10px;">Tails</td> <td style="border: 1px solid black; width: 40px; height: 20px;"></td> <td style="border: 1px solid black; width: 40px; height: 20px;"></td> <td style="border: 1px solid black; width: 40px; height: 20px;"></td> <td></td> </tr> </table> <p>1 out of 6 chance of spinning a three and flipping a head</p>		1	2	3		Heads			Heads 3		Tails					<p>Glencoe: Ch.9: Lessons and Assessments CMP: <u>Common Core Investigations</u> CMP: <u>What do you Expect?: Inv. 2,3,4.1</u> PH: 11.5 – 11.8, 12.1-12.5 Suggested Websites: National Library of Virtual Manipulatives – http://nlvm.usu.edu, Gr. 7 Flipbook http://katm.org/wp/?page_id=91, www.khanacademy.org</p>
	1	2	3													
Heads			Heads 3													
Tails																
❖ 7.SP.8a 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.																
Represent with a fraction of the outcomes in the sample space for which a compound event occurs.																
❖ 7.SP.8b 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.																
<ul style="list-style-type: none"> • Represent sample spaces for compound events using an organized list, tables, and tree diagrams. • Explain verbally what the sample spaces show. • Identify the outcomes in a sample space. 																
❖ 7.SP.8c 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?																
Design and use a simulation to generate frequencies for compound events.																

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 9: Probability of Compound Events - continued	Suggested number of days: 12
State Standards	Suggested Resources
<i>Cluster Heading: Analyze proportional relationships and use them to solve real-world and mathematical problems.</i>	
7.RP.3 Use proportional relationships to solve multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	Glencoe: Ch 9: Lessons and Assessments CMP: <u>Common Core Investigations</u>
<ul style="list-style-type: none"> • Recognize when a problem context represents a proportional relationship • Solve percent problems by using proportions; e.g., if there is a 50% chance of flipping a coin and landing on the tail side, how many times might you predict you will land on a tail if you flip the coin 10 times? • Solve problems involving simple interest, finding tax, markups and mark downs, gratuities and commissions, fees, percent increase, percent decrease and percent of error. 	PH: 6.1,6.4,6.5 Note: More percent examples will be needed

Standards of Mathematical Practice – Unit 9	In this unit, students continue modeling with mathematics (SMP4). Students use appropriate tools (e.g., organized lists, tables, tree diagrams, area models) (SMP.5) and attend to precision (SMP.6) as they create and use probability models.
4. Model with mathematics.	
5. Use appropriate tools strategically.	
6. Attend to precision.	

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 10: Sampling, inferences, and comparing populations		Suggested number of days: 12
This unit includes work with single populations as well as multiple populations. In this unit, students apply their understanding of randomness. Ratio reasoning – including percents – is implicit in this unit (7.RP.3)		
State Standards		Suggested Resources
<i>Cluster Heading: Use random sampling to draw inferences about a population</i>		
7.SP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.		Glencoe: Ch. 10: Lessons and Assessments CMP: <u>Common Core Investigations</u> : Inv. 5 CMP: <u>Data Distributions</u>: Inv. 1, 2 PH: 11.6, 12.1, 12.5, 12.7 PH: 11.6 CMP: <u>Common Core</u>: Inv. 5
<ul style="list-style-type: none"> Determine the validity of the sample based on how well the sample represents the population. Identify random sampling from different types of sampling. Understand that statistics about a population can be found by examining a sample of the population, i.e., estimate the number of items in a jar based on a smaller sample size. 		
7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. 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.		
<ul style="list-style-type: none"> Make multiple samples of the same size to gauge the variations in an estimate. For example, if 4 bags of m&m’s have 23, 24, 22, and 24 candies in each, make a prediction for the number of m&m’s in 25 bags. Use data from a random sample to draw inferences about a population. 		
<i>Cluster heading: Draw informal comparative inferences about two populations</i>		
7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. 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.		Common Core: Inv. 5
7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. 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.		
<ul style="list-style-type: none"> Use measures of center such as mean, median, mode, and interquartile range to compare two populations. 		PH: 12.5, 12.7 CMP: <u>Data Distributions</u>: Inv. 3,4
Standards of Mathematical Practice – Unit 10		In this unit, students engage in modeling (SMP.4) as they draw inferences about a population. They also use data to construct and critique arguments (SMP.3). In doing so, they should also attend to the precision of their use of language and mathematics (SMP.6).
3. Construct viable arguments and critique the reasoning of others.		
4. Model with mathematics		
6. Attend to precision		

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 11: Scale Drawings	suggested number of days: 12
<p>This unit builds on students’ understanding of scale drawings from unit 1, but extends that understanding to include the relationship between the areas of scale drawings. This unit provides a strong foundation for more formal work with the similarity and congruence transformations that students will investigate in Grade 8</p> <ul style="list-style-type: none"> In unit 1, work with scale drawings (7.G.1) was included as an instance of proportional reasoning; however, students did not generate scale drawing at a different scale. Since area relationships in scale drawings are not proportional, they were not addressed at that time. 	
State Standards	Suggested Resources
<i>Cluster Heading: Draw, construct, and describe geometrical figures and describe the relationships between them</i>	
7.G.1 Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Glencoe: Ch. 7: Lessons and Assessments CMP: <u>Comparing and Scaling</u>: Inv. 4 <u>Stretching and Shrinking</u> : Inv. 1, 2
<ul style="list-style-type: none"> Identify similar figures and compute actual lengths based on scale. Reproduce a scale drawing in a different scale. Compute actual lengths and areas from a scale drawing Apply proportion concepts to calculate actual lengths to scale drawings and vice versa. 	

Standards of Mathematical Practice – Unit 11	To build an understanding of how areas of two or more scale drawings relate, students engage in SMP8. They also model with mathematics (SMP.4) and attend to precision (SMP.6) as they engage in solving problems relating to scale drawings.
4. Model with mathematics	
6. Attend to precision	
8. Look for and express regularity in repeated reasoning.	

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 12: Geometric Constructions	suggested number of days: 11
In this unit, students engage in hands-on investigation of the properties of triangles and other geometric shapes. Students also explore numerous angle relationships and use those angle relationships to ask and answer questions in a variety of contexts.	
State Standards	Suggested Resources
Cluster heading: Draw, construct, and describe geometrical figures and describe the relationships between them.	
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.	Glencoe: Ch. 7: Lessons and Assessments CMP: <u>Common Core Investigations</u> PH: 7.4, 7.7 CMP: <u>Filling and Wrapping</u>: Inv. 1- 4 Common Core: Inv. 4.3 Suggested Websites: National Library of Virtual Manipulatives – http://nlvm.use.edu
<ul style="list-style-type: none"> • Construct an angle of a given measure using a protractor. • Construct triangles with given conditions, i.e., construct a triangle given two side lengths and one angle measure and determine how many triangles might be constructed with the given information. • Use protractors, rulers, and technology to create geometric shapes with given conditions. 	
<i>Cluster Heading: Solve real-world and mathematical problems involving angle measure, area, surface area, and volume</i>	
7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure.	PH: 7.2,7.3,7.6 CMP: <u>Common Core</u>: Inv. 4.4 <u>Stretching and Shrinking</u>: Inv. 3
<ul style="list-style-type: none"> • Find the measure of an angle using the relationships of angles. • Identify supplementary angles from a diagram and know that two angles whose sum of their angle measures is 180 degrees. • Identify complementary angles in a diagram and know that the sum of two complementary angles is 90 degrees. • Identify vertical angles from a diagram and know that they have the same measures. • Write algebraic equations to represent and solve an unknown angle problem. 	
Standards of Mathematical Practice – Unit 12	In this unit, students choose appropriate tools (SMP.5) to create constructions with various constraints. Investigating and describing the relationships among geometrical figures requires that students look for and make use of structure (SMP.7) as they construct and critique arguments (SMP.3) that summarize and apply those relationships.
3. Construct viable arguments and critique the reasoning of others.	
5. Use appropriate tools strategically.	
7. Look for and make use of structure.	

* This Math Curriculum Map reflects PARCC released pacing/unit guides 1/15/13 Dana Center

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 13: 2 – D Figures	suggested number of days: 12
<p>In this unit, students build on their grade 6 work with two-dimensional figures and extend their learning to work with circumference and area of circles. While working with formulas for area and circumference, students will be reinforcing previous work with expressions and equations.</p> <ul style="list-style-type: none"> Students in Grade 7 have not previously studying pi, Π. When addressing 7.G.4, they should develop an understanding of pi, Π, as the ratio of the circumference of a circle to its diameter. 7.G.6 only includes perimeter and area, including the circumference and area of circles. Work with 3-dimensional figures will be the focus of unit 12. 	
State Standards	Suggested Resources
<i>Cluster Heading: Solve real-world and mathematical problems involving angle measure, area, surface area, and volume</i>	
7.G.4 Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	<p>Glencoe: Ch. 8: Lessons and Assessments CMP: <u>Common Core Investigations</u> Inv. 4.2 CMP: : <u>Filling and Wrapping</u>: Inv. 1- 5 <u>Stretching and Shrinking</u>: Inv. 2, 3</p> <p>PH: 7.8, 8.4, 8.7</p>
<ul style="list-style-type: none"> Identify parts of a circle – arc, diameter, radius, chord, circumference. Know the formulas: $A = \pi r^2$, $C = \pi d$, or $C = 2\pi r$ Solve problems finding the Area and Circumference of a circle or find the radius or diameter given the Area or Circumference. Give an informal derivation of the relationship between the circumference and the Area of a circle. 	
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.	
<ul style="list-style-type: none"> Calculate the area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. 	

Standards of Mathematical Practice – Unit 13	<p>In this unit, students engage in SMP.7 and SMP.8 as they relate formulas in this unit to particular real-world and mathematical problems. As students persevere in solving real-life and mathematical problems involving measurement (SMP.1), they need to consider the units involved and attend carefully to the meaning of the quantities (SMP.2).</p>
1. Make sense of problems and persevere in solving them.	
2. Reason abstractly and quantitatively.	
7. Look for and make use of structure.	
8. Look for and express regularity in repeated reasoning.	

Grade 7

New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Unit 14: 3-D Figures	suggested number of days: 12
<p>In this unit, students begin working with three-dimensional figures by exploring their plane sections and volumes. In Grade 6, students worked with the volume of rectangular prisms and determined surface areas from nets. This unit extends those understandings as students work with non-rectangular prisms and pyramids.</p> <ul style="list-style-type: none"> Students also investigate the volume and surface area of right pyramids; this is implied in 7.G. 6 	
State Standards	Suggested Resources
<i>Cluster heading: Draw, construct, and describe geometrical figures and describe the relationships between them.</i>	
<p>7.G.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.</p> <ul style="list-style-type: none"> Describe the two-dimensional figure that results from slicing three-dimensional figures, i.e., A slice of a right square pyramid is a square. 	<p>Glencoe: Ch. 8: Lessons and Assessments CMP: <u>Common Core Investigations</u> Inv. 4.1</p>
<i>Cluster Heading: Solve real-world and mathematical problems involving angle measure, area, surface area, and volume</i>	
<p>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.</p> <ul style="list-style-type: none"> Calculate the area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. 	<p>PH: 8.7 CMP: : <u>Filling and Wrapping</u>: Inv. 1- 5 <u>Stretching and Shrinking</u>: Inv. 2, 3</p>
<p>MA 7.G.7 Solve real-world and mathematical problems involving the surface area of spheres.</p> <ul style="list-style-type: none"> From a diagram, identify the radius of the sphere. Apply the formula to find the surface area of a sphere ($SA = 4 \pi r^2$) 	<p>Suggested website: Gr. 7 Flipbook - http://katm.org/wp/?page_id=91</p>

Standards of Mathematical Practice – Unit 14	<p>Students select appropriate tools (SMP.5) and look for and make use of structure (SMP.7) as they investigate 3-dimensional figures. They also model with mathematics as they solve multi-step real-life measurement problems (SMP.4)</p>
4. Model with mathematics	
5. Use appropriate tools strategically.	
7. Look for and make use of structure.	

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

Domains: ALL

PARCC Testing

Mathematics Grade 7

Performance Based Assessment (PBA): March 16-April 10 computer-based, March 23 – April 3 paper-based

End of Year assessment (EOY): May 4 – 29 – computer-based, May 11 – 22 paper-based

REVIEW AND EXTEND 7TH GRADE CURRICULUM

In Grade 7, instructional time should focus 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.

The Review and Extend portion of the map is a time for you to review or re-teach areas of concern as needed based on assessment data from unit tests and benchmark assessments or to extend your students' learning to a higher level. You may use additional appropriate resources that you find helpful. Please take the time to note additional resources for yourself and to share with others.

	Prepare for final exam in June	
All domains and standards	Review and Extend Curriculum as needed based on assessment data from unit tests and benchmark assessments.	PH, Selected CMP Units
PARCC recommendations for in-depth focus at grade 7		
7.RP.2	Students in grade 7 grow in their ability to recognize, represent, and analyze proportional relationships in various ways, including by using tables, graphs, and equations.	
7.NS.3	When students work toward meeting this standard (which is closely connected to 7.NS.1 and 7.NS.2), they consolidate their skill and understanding of addition, subtraction, multiplication and division of rational numbers	
7.EE.3	This is a major capstone standard for arithmetic and its applications.	
7.EE.4	Work toward meeting this standard builds on the work that led to meeting 6.EE.7 and prepares students for the work that will lead to meeting 8.EE.7	
7.G.6	Work toward meeting this standard draws together grades 3-6 work with geometric measurement.	

Grade 7
New Bedford Public Schools - Mathematics Curriculum Map for 2014-2015

REVIEW AND EXTEND 7 TH GRADE CURRICULUM		
	Prepare for final exam in June	
All domains and standards	Review and Extend Curriculum as needed based on assessment data from unit tests and benchmark assessments.	PH, Selected CMP Units
Other:		
Other:		
Other:		

JUNE

FINAL ASSESSMENTS
Final District Math Benchmark Assessment

GRADE 7 MATH CURRICULUM MAP

APPENDIX

FROM MA. MATH 2011 CURRICULUM:

- **TABLE 1 – COMMON ADDITION AND SUBTRACTION SITUATIONS**
- **TABLE 2 – COMMON MULTIPLICATION AND DIVISION SITUATIONS**
- **TABLE 3 – PROPERTIES OF OPERATIONS**
- **TABLE 4 – PROPERTIES OF EQUALITY**
- **TABLE 5 – PROPERTIES OF INEQUALITY**
- **ILLUSTRATION 1 – THE NUMBER SYSTEM**
- **ONLINE RESOURCES**

ADDITIONAL RESOURCE:

- **ALGEBRA FOUR-BLOCK TEMPLATE**

TABLE 1. Common addition and subtraction situations.¹

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? $2 + 3 = ?$	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? $2 + ? = 5$	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? $? + 3 = 5$
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? $5 - 2 = ?$	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? $5 - ? = 3$	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? $? - 2 = 3$

	Total Unknown	Addend Unknown	Both Addends Unknown ²
Put Together/ Take Apart ³	Three red apples and two green apples are on the table. How many apples are on the table? $3 + 2 = ?$	Five apples are on the table. Three are red and the rest are green. How many apples are green? $3 + ? = 5, 5 - 3 = ?$	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare ⁴	(“How many more?” version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? (“How many fewer?” version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? $2 + ? = 5, 5 - 2 = ?$	(Version with “more”): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? $2 + 3 = ?, 3 + 2 = ?$	(Version with “more”): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? $5 - 3 = ?, ? + 3 = 5$

¹ Adapted from Box 2-4 of Mathematics Learning in Early Childhood, National Research Council (2009, pp. 32, 33).

² These *take apart* situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean *makes* or *results in* but always does mean *is the same number as*.

³ Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation especially for small numbers less than or equal to 10.

⁴ For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using *more* for the bigger unknown and using *less* for the smaller unknown). The other versions are more difficult.

TABLE 2. Common multiplication and division situations.⁵

	Unknown Product	Group Size Unknown (“How many in each group?” Division)	Number of Groups Unknown (“How many groups?” Division)
	$3 \times 6 = ?$	$3 \times ? = 18$ and $18 \div 3 = ?$	$? \times 6 = 18$ and $18 \div 6 = ?$
Equal Groups	There are 3 bags with 6 plums in each bag. How many plums are there in all? <i>Measurement example.</i> You need 3 lengths of string, each 6 inches long. How much string will you need altogether?	If 18 plums are shared equally into 3 bags, then how many plums will be in each bag? <i>Measurement example.</i> You have 18 inches of string, which you will cut into 3 equal pieces. How long will each piece of string be?	If 18 plums are to be packed 6 to a bag, then how many bags are needed? <i>Measurement example.</i> You have 18 inches of string, which you will cut into pieces that are 6 inches long. How many pieces of string will you have?
Arrays,⁶ Area⁷	There are 3 rows of apples with 6 apples in each row. How many apples are there? <i>Area example.</i> What is the area of a 3 cm by 6 cm rectangle?	If 18 apples are arranged into 3 equal rows, how many apples will be in each row? <i>Area example.</i> A rectangle has area 18 square centimeters. If one side is 3 cm long, how long is a side next to it?	If 18 apples are arranged into equal rows of 6 apples, how many rows will there be? <i>Area example.</i> A rectangle has area 18 square centimeters. If one side is 6 cm long, how long is a side next to it?
Compare	A blue hat costs \$6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost? <i>Measurement example.</i> A rubber band is 6 cm long. How long will the rubber band be when it is stretched to be 3 times as long?	A red hat costs \$18 and that is 3 times as much as a blue hat costs. How much does a blue hat cost? <i>Measurement example.</i> A rubber band is stretched to be 18 cm long and that is 3 times as long as it was at first. How long was the rubber band at first?	A red hat costs \$18 and a blue hat costs \$6. How many times as much does the red hat cost as the blue hat? <i>Measurement example.</i> A rubber band was 6 cm long at first. Now it is stretched to be 18 cm long. How many times as long is the rubber band now as it was at first?
General	$a \times b = ?$	$a \times ? = p$ and $p \div a = ?$	$? \times b = p$ and $p \div b = ?$

⁵ The first examples in each cell are examples of discrete things. These are easier for students and should be given before the measurement examples.

⁶ The language in the array examples shows the easiest form of array problems. A harder form is to use the terms rows and columns: The apples in the grocery window are in 3 rows and 6 columns. How many apples are in there? Both forms are valuable.

⁷ Area involves arrays of squares that have been pushed together so that there are no gaps or overlaps, so array problems include these especially important measurement situations.

TABLE 3. The properties of operations. Here a , b and c stand for arbitrary numbers in a given number system. The properties of operations apply to the rational number system, the real number system, and the complex number system.

<i>Associative property of addition</i>	$(a + b) + c = a + (b + c)$
<i>Commutative property of addition</i>	$a + b = b + a$
<i>Additive identity property of 0</i>	$a + 0 = 0 + a = a$
<i>Existence of additive inverses</i>	For every a there exists $-a$ so that $a + (-a) = (-a) + a = 0$.
<i>Associative property of multiplication</i>	$(a \times b) \times c = a \times (b \times c)$
<i>Commutative property of multiplication</i>	$a \times b = b \times a$
<i>Multiplicative identity property of 1</i>	$a \times 1 = 1 \times a = a$
<i>Existence of multiplicative inverses</i>	For every $a \neq 0$ there exists $1/a$ so that $a \times 1/a = 1/a \times a = 1$.
<i>Distributive property of multiplication over addition</i>	$a \times (b + c) = a \times b + a \times c$

TABLE 4. The properties of equality. Here a , b and c stand for arbitrary numbers in the rational, real, or complex number systems.

<i>Reflexive property of equality</i>	$a = a$
<i>Symmetric property of equality</i>	If $a = b$, then $b = a$.
<i>Transitive property of equality</i>	If $a = b$ and $b = c$, then $a = c$.
<i>Addition property of equality</i>	If $a = b$, then $a + c = b + c$.
<i>Subtraction property of equality</i>	If $a = b$, then $a - c = b - c$.
<i>Multiplication property of equality</i>	If $a = b$, then $a \times c = b \times c$.
<i>Division property of equality</i>	If $a = b$ and $c \neq 0$, then $a \div c = b \div c$.
<i>Substitution property of equality</i>	If $a = b$, then b may be substituted for a in any expression containing a .

TABLE 5. The properties of inequality. Here a , b and c stand for arbitrary numbers in the rational or real number systems.

Exactly one of the following is true: $a < b$, $a = b$, $a > b$.

If $a > b$ and $b > c$ then $a > c$.

If $a > b$, then $b < a$.

If $a > b$, then $-a < -b$.

If $a > b$, then $a \pm c > b \pm c$.

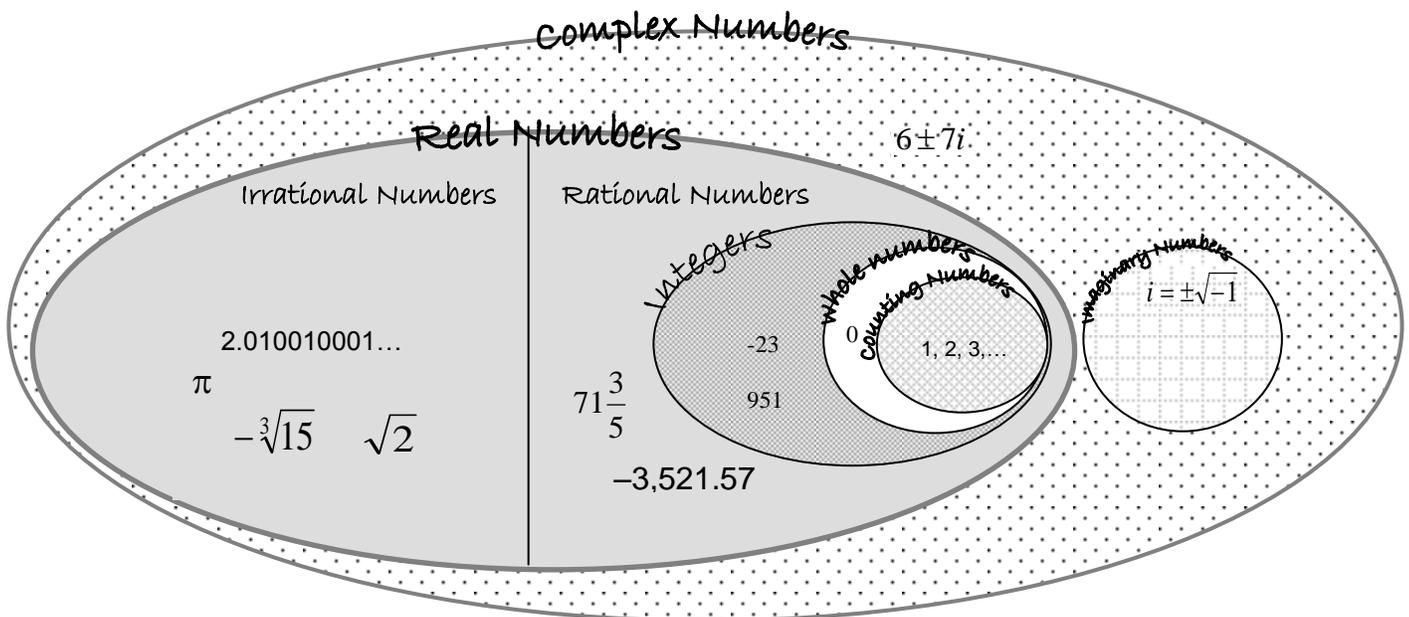
If $a > b$ and $c > 0$, then $a \times c > b \times c$.

If $a > b$ and $c < 0$, then $a \times c < b \times c$.

If $a > b$ and $c > 0$, then $a \div c > b \div c$.

If $a > b$ and $c < 0$, then $a \div c < b \div c$.

ILLUSTRATION 1. The Number System.



Below is a listing of some websites that provide valuable resources to support math instruction. The list is only a partial list of the many online resources for teachers now becoming available. Additional links to websites are also included in grade level maps. Please add others as you find appropriate.

Website	Description
http://www.doe.mass.edu/frameworks/math/0311.pdf	Massachusetts 2011 Mathematics Curriculum Frameworks, which incorporate the Common Core State Standards for content and the standards of mathematical practice.
http://www.doe.mass.edu/candi/model/files.html	Model Curriculum Units for ELA and Math developed by teachers and administrators in Massachusetts as examples of instructional units aligned to our standards and the Common Core State Standards. Units include unit plans, standards-based lesson plans, assessments, student handouts, etc.
www.parcconline.org/samples/item-task-prototypes click on a grade and content area listed on the left	PARCC's sample items - The Partnership for Assessment of Readiness for College and Careers (PARCC) has released a new set of sample test items in English language arts/literacy and mathematics. These sample items will help schools prepare their students for the new PARCC assessments. With this new set, PARCC now has posted over 70 sample items on its website in grades 3–11 in both subjects.
www.wida.us	WIDA standards for ELL students include specific standards for content areas such as math. This website has a downloadable library of helpful resources and information for teachers.
www.pearsonsuccessnet.com	Website link to register for online access to Teacher edition/answer keys/assessments for CMP 2 and CMP2 Common Core Investigations booklet with lessons, lesson plans, student pages, and assessments. Prentice Hall resources available as well
http://www.connected.mcgraw-hill.com	Website link to Glencoe Math materials with online lesson presentations, unit and lesson planning resources, student work pages, differentiation suggestions, ELL supports, tiered instructional options, and assessments. See your district administrator for access codes for registration.
https://www.teachingchannel.org/	You will need to register for this site but there is no cost. The Teaching Channel videos are very helpful to teachers, parents, and administrators and there are many classroom examples that highlight the Common Core standards for content and math practice.
http://katm.org/wp/?page_id=91	Grade level “flip books” with suggestions for integration of Standards for Math Practice for each standard, explanation of the content standard, instructional strategy recommendations, student misconceptions to address, etc. Developed with NC, Ohio, and Arizona departments of education.
http://illuminations.nctm.org/	This website has grade level resources for lessons, online activities, etc. that are standards-based. The website has been developed by the National Council for Teachers of Mathematics - NCTM
www.mathsolutions.com	Marilyn Burns Associates provides lesson plans and instructional resources for teachers aligned to the common core.
http://nlvm.usu.edu	National Library of Virtual Manipulatives provides grade level appropriate learning activities for most major math concepts. The activities are easy to follow and can provide support for teaching a concept, practice, assessment, or for homework help. Students can access the site from home as well.

Algebra Four-block Template

verbal explanation/process diagram

Table

Equation

