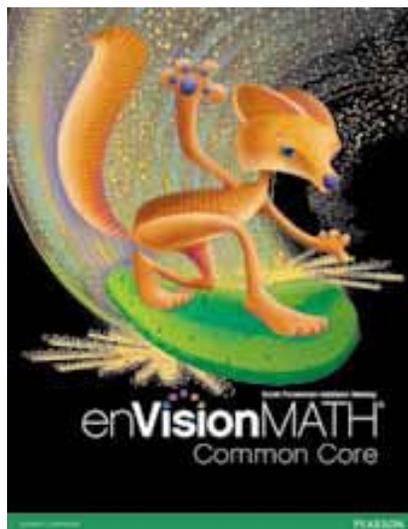


A Correlation of

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Common Core ©2012



to the

West Virginia Mathematics Criteria Grade 6

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PUBLISHER:	Pearson Education Inc., publishing as Scott Foresman		
SUBJECT:	Mathematics		
SPECIFIC GRADE:	Grade 6		
COURSE:	Mathematics -3006 - MATH 6		
TITLE:	Scott Foresman-Addison Wesley enVisionMATH Common Core		
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GENERIC EVALUATION CRITERIA
20013-2016 – Off Cycle Year Adoption
Grade 6 Mathematics

R-E-S-P-O-N-S-E			CRITERIA	NOTES
Yes	No	N/A		
X			I. INTER-ETHNIC The instructional material meets the requirements of inter-ethnic: concepts, content and illustrations, as set by West Virginia Board of Education Policy (Adopted December 1970).	
X			II. EQUAL OPPORTUNITY The instructional material meets the requirements of equal opportunity: concept, content, illustration, heritage, roles contributions, experiences and achievements of males and females in American and other cultures, as set by West Virginia Board of Education Policy (Adopted May 1975).	
X			III. FORMAT The resource is available as an option for adoption in an interactive electronic format.	

INSTRUCTIONAL MATERIALS ADOPTION: 21st CENTURY LEARNING EVALUATION CRITERIA

GENERAL EVALUATION CRITERIA

**20013-2016 – Off Cycle Year Adoption
Grade 6 Mathematics**

INSTRUCTIONAL MATERIALS ADOPTION: GENERAL EVALUATION CRITERIA

The general evaluation criteria apply to each grade level and are to be evaluated for each grade level unless otherwise specified. These criteria consist of information critical to the development of all grade levels. In reading the general evaluation criteria and subsequent specific grade level criteria, **e.g. means “examples of” and i.e. means that “each of” those items must be addressed.** Eighty percent of the general criteria must be met with I (In-depth) or A (Adequate) in order to be recommended.

(Vendor/Publisher) SPECIFIC LOCATION OF CONTENT WITHIN PRODUCT	(IMR Committee) Responses										
	I=In-depth	A=Adequate	M=Minimal	N=Nonexistent	I		A		M		N
For student mastery of content standards and objectives, the instructional materials will provide students with the opportunity to apply:											
A. MATHEMATICAL PRACTICES											
<p><i>enVisionMATH Common Core</i> is built on a foundation of problem-based instruction that has sense-making at its heart. Each topic includes at least one <i>problem-solving lesson</i> in which students focus on honing their sense-making and problem-solving skills. Each lesson begins with <i>Problem-Based Interactive Learning</i>, an activity in which students interact with their peers and teachers to make sense of and decide on a</p>	<p>1. Make sense of problems and persevere in solving them.</p> <ul style="list-style-type: none"> • Explain to themselves the meaning of a problem and looking for entry points to its solution. • Analyze givens, constraints, relationships, and goals • Make conjectures about the form and meaning of the solution attempt. • Plan a solution pathway rather than simply jumping into a solution. • Consider analogous problems and try special cases and simpler forms of insight into its solution. • Monitor and evaluate their progress and change course if 										

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<p>workable solution for a real-world situation. Another feature of each lesson is the set of problem-solving exercises in which students persevere by applying different skills and strategies to solve problems.</p> <p>SE/TE: Topic 1: 8, 16, 20, 24-25; Topic 2: 33, 37, 38, 47, 50-53; Topic 3: 66, 67, 68, 84-87; Topic 4: 102-105, 108, 110-113; Topic 5: 122, 133, 135, 136-137; Topic 6: 152, 154-155; Topic 7: 165, 168, 176, 178-179; Topic 8: 190, 194-195; Topic 9: 205, 207, 211, 213, 214-215; Topic 10: 225, 228, 236, 241, 250-253; Topic 11: 267, 276, 288, 289, 290-291; Topic 12: 304, 311, 314-315; Topic 13: 327, 328-329, 335, 336; Topic 14: 346, 349, 351, 356, 362-363; Topic 15: 390-391; Topic 16: 410, 413, 416, 418-419; Topic 17: 428, 433, 443, 444-447; Topic 18: 457, 460, 465, 466-469; Topic 19: 481, 486, 489, 492, 500-501</p> <p>TE: Topic 1: 22B; Topic 2: 40B; Topic 4: 106B; Topic 5: 126B; Topic 6: 154B; Topic 7: 170B; Topic 8: 188B, 194B; Topic 9: 204B, 212B; Topic 13: 320B; Topic 14: 352B; Topic 16: 418B; Topic 17: 424A; Topic 19: 494B, 500B</p>	<p>necessary.</p> <ul style="list-style-type: none"> • Transform algebraic expressions or change the viewing window on their graphing calculator to get information. • Explain correspondences between equations, verbal descriptions, tables, and graphs. • Draw diagrams of important features and relationships, graph data, and search for regularity or trends. • Use concrete objects or pictures to help conceptualize and solve a problem. • Check their answers to problems using a different method. • Ask themselves, "Does this make sense?" • Understand the approaches of others to solving complex problems and identify correspondences between approaches 									

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<p>enVisionMATH Common Core provides scaffolded instruction to help students develop both quantitative and abstract reasoning. In the <i>Visual Learning Bridge</i>, students can see how to represent a given situation numerically or algebraically. They will have opportunities later in the lesson to reason abstractly as they endeavor to represent situations symbolically.</p> <p>Reasonableness exercises remind students to compare their work to the original situation. In the <i>Do You Understand?</i> part of the Guided Practice, students gain experiences with quantitative reasoning as they consider the meaning of different parts of an expression or equation.</p> <p>Reasoning problems throughout the exercise sets focus students' attention on the structure or meaning of an operation, for example, rather than merely the solution.</p> <p>SE/TE: Topic 1: 5, 6, 9, 12, 22, 25; Topic 2: 34, 51; Topic 3: 63, 65, 66, 75, 76, 79, 81, 83; Topic 4: 96, 100, 108; Topic 5: 122, 128, 132, 133; Topic 6: 144, 149, 152, 155; Topic 7: 167, 173, 175, 179; Topic 8: 186, 188, 190; Topic 9: 202, 203, 204, 206, 208, 209, 211, 213; Topic 10: 223, 224, 228, 232, 235, 239, 241, 243, 244, 248, 251,</p>	<p>2. Reason abstractly and quantitatively.</p> <ul style="list-style-type: none"> • Make sense of quantities and their relationships in problem situations. • Bring two complementary abilities to bear on problems involving quantitative relationships: <ul style="list-style-type: none"> ○ Decontextualize (abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents and ○ Contextualize (pause as needed during the manipulation process in order to probe into the referents for the symbols involved). • Use quantitative reasoning that entails creating a coherent representation of the problem at hand, considering the units involved, and attending to the meaning of quantities, not just how to compute them • Know and flexibly use different properties of operations and objects. 										

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<p>252; Topic 11: 263, 264, 267, 268, 271, 274, 275, 276, 282, 289; Topic 12: 300, 303, 307, 308, 309, 312; Topic 13: 323, 325, 327, 328; Topic 14: 348, 350, 353, 360; Topic 15: 378, 388; Topic 16: 402, 405, 406, 412, 413, 418; Topic 17: 427, 432, 433, 436, 439, 440, 442; Topic 18: 462, 468; Topic 19: 477, 479, 480, 481, 482, 483, 488, 489, 490, 492, 495, 496, 499, 500</p> <p>TE: Topic 1: 24B; Topic 2: 42B; Topic 3: 62B; Topic 3: 66B; Topic 4: 102B; Topic 7: 166B; Topic 8: 190B; Topic 10, 220B, 234B, 240B; Topic 12: 298E, 308B; Topic 13: 324B; Topic 14: 344B; Topic 15: 370E; Topic 16: 400B, 404B; Topic 19: 498B</p>	<p>(Continued)</p> <p>2. Reason abstractly and quantitatively.</p> <ul style="list-style-type: none"> • Make sense of quantities and their relationships in problem situations. • Bring two complementary abilities to bear on problems involving quantitative relationships: <ul style="list-style-type: none"> ○ Decontextualize (abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents and ○ Contextualize (pause as needed during the manipulation process in order to probe into the referents for the symbols involved). • Use quantitative reasoning that entails creating a coherent representation of the problem at hand, considering the units involved, and attending to the meaning of quantities, not just how to compute them • Know and flexibly use different properties of operations and objects. 											

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<p>Consistent with a focus on reasoning and sense-making is a focus on critical reasoning – argumentation and critique of arguments. In Pearson’s enVisionMATH Common Core, the <i>Problem-Based Interactive Learning</i> affords students opportunities to share with classmates their thinking about problems, their solution methods, and their reasoning about the solutions. Many exercises found throughout the program specifically call for students to use reasoning and to justify or explain their solutions.</p> <p><i>Writing to Explain</i> exercises in Grades 3–6 help students develop foundational critical reasoning skills by having them construct explanations for processes. The ability to articulate a clear explanation for a process is a stepping stone to critical analysis and reasoning of both the student’s own processes and those of others.</p> <p>SE/TE: Topic 1: 12, 16, 20, 22, Topic 2: 40, 41, 43, Topic 3: 64, 66, 72, 82, Topic 4: 108, Topic 5: 121, 122, 124, Topic 6: 148, Topic 7: 162, 164, 165, 179, Topic 10: 235, 244, Topic 11: 275, 280, Topic 12: 311, Topic 16: 405, 410, Topic 17: 433, 435, 445, Topic 18: 459, 463, Topic 19: 477, 478, 479, 485, 498</p>	<p>3. Construct viable arguments and critique the reasoning of others.</p> <ul style="list-style-type: none"> • Understand and use stated assumptions, definitions, and previously established results in constructing arguments. • Make conjectures and build a logical progression of statements to explore the truth of their conjectures. • Analyze situations by breaking them into cases • Recognize and use counterexamples. • Justify their conclusions, communicate them to others, and respond to the arguments of others. • Reason inductively about data, making plausible arguments that take into account the context from which the data arose. • Compare the effectiveness of plausible arguments. • Distinguish correct logic or reasoning from that which is flawed and, if there is a flaw, explain what it is <ul style="list-style-type: none"> ○ Elementary students construct arguments using concrete referents such as objects, drawings, diagrams, and actions. ○ Later students learn to determine domains to which an argument applies. • Listen or read the arguments of others, decide whether they make sense, and ask useful question to clarify or improve arguments. 							

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TE: Topic 1: 8B; Topic 3: 82B; Topic 7: 164B Topic 11: 270B, 284B, 288B; Topic 12: 302B, 308B, 310B; Topic 13: 324B, 328B; Topic 14: 344B, 362B; Topic 17: 424B	(Continued) 3. Construct viable arguments and critique the reasoning of others. <ul style="list-style-type: none"> • Understand and use stated assumptions, definitions, and previously established results in constructing arguments. • Make conjectures and build a logical progression of statements to explore the truth of their conjectures. • Analyze situations by breaking them into cases • Recognize and use counterexamples. • Justify their conclusions, communicate them to others, and respond to the arguments of others. • Reason inductively about data, making plausible arguments that take into account the context from which the data arose. • Compare the effectiveness of plausible arguments. • Distinguish correct logic or reasoning from that which is flawed and, if there is a flaw, explain what it is <ul style="list-style-type: none"> ○ Elementary students construct arguments using concrete referents such as objects, drawings, diagrams, and actions. ○ Later students learn to determine domains to which an argument applies. • Listen or read the arguments of others, decide whether they make sense, and ask useful question to clarify or improve arguments. 										

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<p>Students in Pearson’s <i>enVisionMATH Common Core</i> are introduced to mathematical modeling in the early grades. They first use manipulatives and drawings and then equations to model addition and subtraction situations. The <i>Visual Learning Bridge</i> presents real-world situations, and students are shown how these can be modeled mathematically. Students expand their modeling skills to include representations such as tables and graphs, as well as equations.</p> <p>SE/TE: Topic 1: 12; Topic 2: 35, 38, 47, 49; Topic 3: 62, 81, 83; Topic 4: 99, 103, 104, 111; Topic 5: 127, 137; Topic 6: 145; Topic 7: 163, 168, 179; Topic 8: 193; Topic 9: 207, 209; Topic 10: 236, 239; Topic 11: 268, 276, 280, 283; Topic 12: 301; Topic 13: 323, 327, 329; Topic 14: 346; Topic 15: 374, 381, 384, 388, 391; Topic 17: 428, 433, 444; Topic 18: 457, 459, 464; Topic 19: 479, 486, 496, 499</p> <p>TE: Topic 3: 64B, 84B; Topic 9: 206B; Topic 10: 220E, 222B, 230B; Topic 12: 306B; Topic 13: 320B, 320E, 326B; Topic 14: 342B, 350B, 358B; Topic 15: 376B; Topic 18: 452E</p>	<p>4. Model with mathematics.</p> <ul style="list-style-type: none"> Apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. <ul style="list-style-type: none"> In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Make assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. Identify important quantities in a practical situation Map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. Analyze those relationships mathematically to draw conclusions. Interpret their mathematical results in the context of the situation. Reflect on whether the results make sense, possibly improving the model if it has not served its purpose. 											

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<p>Students become fluent in the use of a wide assortment of tools ranging from physical objects, including manipulatives, rulers, protractors, and even pencil and paper, to digital tools, such as eTools, calculators, and computers. As students become more familiar with the tools available to them, they are able to begin making decisions about which tools are most helpful in a particular situation.</p> <p>SE/TE: Topic 1: 25; Topic 2: 44, 51; Topic 3: 79; Topic 4: 97, 105; Topic 5: 127, 128, 130, 137; Topic 6: 144, 147, 154, 155; Topic 7: 168, 179; Topic 8: 191, 193; Topic 9: 205; Topic 10: 227, 229, 233, 241; Topic 11: 265, 266-269, 273; Topic 12: 304, 313, 315; Topic 13: 322, 328, 336; Topic 14: 355, 357; Topic 15: 384, 387, 388; Topic 16: 419; Topic 18: 467, 468; Topic 19: 477, 479, 486, 492, 497</p> <p>TE: Topic 1: 18B; Topic 2: 32B, 50B; Topic 3: 70B, 78B; Topic 4: 96B, 98B; Topic 5: 120B; Topic 5: 128B, 132B; Topic 7: 162B; Topic 9: 202B; Topic 10: 224B, 246B; Topic 11: 266B; Topic 12: 298B; Topic 13: 322B, 334B; Topic 14: 348B; Topic 15: 378B; Topic 17: 430B, 444B; Topic 18: 452A, 452B, 458B, 462B, 466B; Topic 19: 476B</p>	<p>5. Use appropriate tools strategically.</p> <ul style="list-style-type: none"> • Consider available tools when solving a mathematical problem. (these tools might include pencil and paper, concrete models, a ruler, protractor, calculator, spreadsheet, computer algebra system, a statistical package, or dynamic geometry software. • Are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. <ul style="list-style-type: none"> ○ High school students analyze graphs of functions and solutions generated using a graphing calculator • Detect possible errors by using estimations and other mathematical knowledge. • Know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. • Identify relevant mathematical resources and use them to pose or solve problems. • Use technological tools to explore and deepen their understanding of concepts. 										

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<p>Students are expected to use mathematical terms and symbols with precision. Key terms and concepts are highlighted in each lesson. The <i>Problem-Based Interactive Learning</i> activity provides repeated opportunities for children to use precise language to explain their solution paths while solving problems.</p> <p>In the <i>Do You Understand?</i> feature, students revisit these key terms or concepts and provide explicit definitions or explanations. In Grades 3–6, the <i>Writing to Explain</i> and <i>Think About the Structure</i> exercises require students to use precise language to provide clear explanations of terms, concepts, or processes.</p> <p>Students are reminded to use appropriate units of measure in their solutions as well as in labels for diagrams, graphs, and other kinds of displays.</p> <p>SE/TE: Topic 1: 15; Topic 2: 32, 47, 50; Topic 3: 62, 65, 66; Topic 6: 151, 152, 154; Topic 7: 167, 176; Topic 8: 195; Topic 10: 223, 248, 252; Topic 11: 264, 279, 285; Topic 12: 306; Topic 14: 345, 355, 359; Topic 15: 391; Topic 16: 401, 410, 411; Topic 17: 433, 439, 440, 445; Topic 18: 456, 463; Topic 19: 492, 496, 501</p>	<p>6. Attend to precision.</p> <ul style="list-style-type: none"> • Try to communicate precisely to others. • Try to use clear definitions in discussion with others and in their own reasoning. • State the meaning of the symbols they choose, including using the equal sign consistently and appropriately. • Specify units of measure and label axes to clarify the correspondence with quantities in a problem. • Calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. <ul style="list-style-type: none"> ○ In the elementary grades, students give carefully formulated explanations to each other. ○ In high school, students have learned to examine claims and make explicit use of definitions. 												

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TE: Topic 1: 2H, 2K; Topic 2: 36B; Topic 3: 76B, 80B; Topic 4: 110B; Topic 5: 124B, 134B; Topic 6: 146B, 148B; Topic 7: 172B; Topic 8: 186B, 192B; Topic 9: 200E, 208B, 210B; Topic 10: 220A, 242B, 250B; Topic 11: 260A, 260E, 262B, 274B, 278B, 282B; Topic 12: 300B, 314B; 330B; Topic 14: 342A; Topic 15: 380B, 382B; Topic 16: 398E, 408B, 412B, 414B; Topic 17: 426B; Topic 18: 452B; Topic 19: 474E, 480B, 484B	(Continued)										
	6. Attend to precision. <ul style="list-style-type: none"> • Try to communicate precisely to others. • Try to use clear definitions in discussion with others and in their own reasoning. • State the meaning of the symbols they choose, including using the equal sign consistently and appropriately. • Specify units of measure and label axes to clarify the correspondence with quantities in a problem. • Calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. <ul style="list-style-type: none"> ○ In the elementary grades, students give carefully formulated explanations to each other. ○ In high school, students have learned to examine claims and make explicit use of definitions. 										

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<p>Students are encouraged to look for structure as they develop solution plans. In the <i>Look for a Pattern</i> problem-solving lessons, children in the early years develop a sense of patterning with visual and physical objects. As students mature in their mathematical thinking, they look for structure in numerical operations by focusing on place value and properties of operations. This focus on looking for and recognizing structure enables students to draw from patterns as they formalize their thinking about the structure of operations.</p> <p>SE/TE: Topic 1: 12, 16, 20, 25; Topic 2: 33, 34, 35, 41, 44, 49; Topic 3: 63, 66, 77, 81, 86; Topic 4: 97, 100, 104, 108; Topic 5: 130; Topic 6: 163, 168; Topic 7: 171; Topic 8: 187, 189; Topic 9: 203; Topic 10: 232, 248, 252; Topic 11: 264, 272, 281; Topic 12: 301, 307, 315; Topic 13: 325, 331, 336; Topic 14: 346, 353, 356, 360, 363; Topic 15: 373, 374, 377, 379, 381, 384; Topic 16: 402, 406, 413, 419; Topic 17: 440; Topic 18: 463, 468; Topic 19: 483, 486</p> <p>TE: Topic 1: 2G, 2L, 4B, 10B, 14B; Topic 2: 34B, 46B, 48B; Topic 3: 74B; Topic 5: 136B; Topic 6: 150B; Topic 7: 178B; Topic 9: 200F, 214B; Topic 10: 220F, 238B; Topic 11: 260B, 260F, 290B; Topic 12: 298F;</p>	<p>7. Look for and make use of structure.</p> <ul style="list-style-type: none"> • Look closely to discern a pattern or structure. <ul style="list-style-type: none"> ○ Young students might notice that three and seven more is the same amount as seven and three more or they may sort a collection of shapes according to how many sides the shapes have. ○ Later, students will see 7×8 equals the well remembered $7 \times 5 - 7 \times 3$, in preparation for the distributive property. ○ In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. • Step back for an overview and can shift perspective. • See complicated things, such as some algebraic expressions, as single objects or composed of several objects. 							

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Topic 14: 354B, 362B; Topic 15: 370F, 372B; Topic 16: 394A, 398F; Topic 17: 424F, 434B; Topic 18: 452F; Topic 19: 474B, 474F, 478B, 482B, 488B	(Continued) 7. Look for and make use of structure. <ul style="list-style-type: none"> • Look closely to discern a pattern or structure. <ul style="list-style-type: none"> ○ Young students might notice that three and seven more is the same amount as seven and three more or they may sort a collection of shapes according to how many sides the shapes have. ○ Later, students will see 7×8 equals the well remembered $7 \times 5 - 7 \times 3$, in preparation for the distributive property. ○ In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. • Step back for an overview and can shift perspective. • See complicated things, such as some algebraic expressions, as single objects or composed of several objects. 										

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<p>Students are prompted to look for repetition in computations to help them develop shortcuts and become more efficient problem solvers. Students are reminded to think about problems they have encountered previously that may share features or processes. They are encouraged to draw on the solution plan developed for such problems, and as their mathematical thinking matures, to look for and apply generalizations to similar situations. The <i>Problem-Based Interactive Learning</i> activities offer students opportunities to look for regularity in the way operations behave.</p> <p>SE/TE: Topic 2: 48-49; Topic 3: 65, 66, 78, 86; Topic 6: 153; Topic 7: 170, 171, 172, 178; Topic 9: 214-215; Topic 10: 222, 231, 238, 240; Topic 11: 281, 287, 290-291; Topic 12: 301; Topic 14: 345, 353; Topic 15: 376-377, 378-379, 380-381, 382-385; Topic 16: 402, 415; Topic 17: 426-429, 430-433, 434-437, 438-441, 442-443; Topic 18: 457, 458-461, 462-463, 464-465; Topic 19: 488, 489, 493, 500, 501</p> <p>TE: Topic 6: 144B; Topic 7: 174B; Topic 9: 200B; Topic 11: 270B; Topic 14: 344B, 362B; Topic 15: 372B; Topic 16: 398B; Topic 17: 438B</p>	<p>8. Look for and express regularity in repeated reasoning.</p> <ul style="list-style-type: none"> • Notice if calculations are repeated. • Look both for general methods and for shortcuts. <ul style="list-style-type: none"> ○ Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeated decimal. ○ Middle school students might abstract the equation $(y-2)/((x-1)=1$ by paying attention to the calculation of slope as they repeatedly check whether the points are on the line through (1,2) with a slope 3. ○ Noticing the regularity in the way terms cancel when expanding $(x-1)(x+1)(x^2+1)$ and $(x-1)(x^3+x^2+x+1)$ might lead high school students to the general formula for the sum of a geometric series. • Maintain oversight of the process of solving a problem, while attending to the details. • Continually evaluate the reasonableness of intermediate results. 												

SPECIFIC EVALUATION CRITERIA

2013-2016 – Off Cycle Year Adoption

Grade 6 Mathematics

In Grade 6, instructional time should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting and using expressions and equations; and (4) developing understanding of statistical thinking.

1. Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

2. Students use the meaning of fractions, the meanings of multiplication and division and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

3. Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities.

4. Building on and reinforcing their understanding of number, students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps and symmetry, considering the context in which the data were collected.

Students in Grade 6 also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces and relating the shapes to rectangles. Using these methods, students discuss, develop and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

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For student mastery of content standards and objectives, the instructional materials will provide students with the opportunity to											
A. Ratios & Proportional Relationships											
Understand ratio concepts and use ratio reasoning to solve problems.											
SE/TE: Topic 7:178-179; Topic 12: 300-301 TE: Topic 7:178A-178B, 179A-179B; Topic 12: 300A-300B, 301A-301B	1. understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”										
SE/TE: Topic 12: 306-307, 314-315; Topic 13: 324-325 TE: Topic 12: 306A-307B, 314A-315B; Topic 13: 324A-325B	2. understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.” (Expectations for unit rates in this grade are limited to non-complex fractions.)										

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<p>SE/TE: Topic 12: 302-305; Topic 13: 322-323, 326-327, 328-329, 344-347, 348-349, 352-353</p> <p>TE: Topic 12: 302A-305B; Topic 13: 322A-323B, 326A-327B, 328A-329B, 344A-347B, 348A-349B, 352A-353B</p> <p>a. SE/TE: Topic 13: 322-323, 330-332 TE: Topic 13: 322A-323B, 330A-333B</p> <p>b. SE/TE: Topic 12: 308-209; Topic 13: 324-325 TE: Topic 12: 308A-209B; Topic 13: 324A-325B</p> <p>c. SE/TE: Topic 14: 350-351, 354-357, 358-361, 362-363 TE: Topic 14: 350A-351B, 354A-357B, 358A-361B, 362A-363B</p> <p>d. SE/TE: Topic 16: 400-403, 404-407, 408-411, 412-413, 414-417, 418-419 TE: Topic 16: 400A-403B, 404A-407B, 408A-411B, 412A-413B, 414A-417B, 418A-419B</p>	<p>3. use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.</p> <p>a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables and plot the pairs of values on the coordinate plane. Use tables to compare ratios.</p> <p>b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?</p> <p>c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.</p> <p>d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</p>										

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	<p>B. The Number System Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</p>										
<p>SE/TE: Topic 5: 128-131, 132-133, 134-135; Topic 6: 144-145, 146-147, 148-149, 150-153; Topic 7: 162-163, 166-169, 170-171, 172-173, 174-177; Topic 8: 186-187, 188-189, 190-191, 192-193; Topic 9: 202-203, 204-205, 206-207, 208-209, 210-211</p> <p>TE: Topic 5: 128A-131B, 132A-133B, 134A-135B; Topic 6: 144A-145B, 146A-147B, 148A-149B, 150A-153B, 158A-159B; Topic 7: 162A-163B, 166A-169B, 170A-171B, 172A-173B, 174A-177B; Topic 8: 186A-187B, 188A-189B, 190A-191B, 192A-193B; Topic 9: 202A-203B, 204A-205B, 206A-207B, 208A-209B, 210A-211B</p>	<p>1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.</p>										
	<p>Compute fluently with multi-digit numbers and find common factors and multiples.</p>										
<p>SE/TE: Topic 1: 4-7, 8-9; Topic 2: 46-47; Topic 3: 74-75; Topic 4: 106-109</p> <p>TE: Topic 1: 4A-7B, 8A-9B; Topic 2: 46A-47B; Topic 3: 74A-75B; Topic 4: 106A-109B</p>	<p>2. fluently divide multi-digit numbers using the standard algorithm.</p>										

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<p>SE/TE: Topic 1: 14-17, 18-21, 22-23, 24-25; Topic 2: 42-45; Topic 3: 62-63, 64-65, 66-69, 70-73, 76-77, 78-79, 84-87; Topic 6: 154-55</p> <p>TE: Topic 1: 14A-17B, 18A-21B, 22A-23B, 24A-25B; Topic 2: 42A-45B; Topic 3: 62A-63B, 64A-65B, 66A-69B, 70A-73B, 76A-77B, 78A-79B, 84A-87B; Topic 6: 154A-155B</p>	3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.										
<p>SE/TE: Topic 5: 120-123, 124-125, 126-127, 136-137; Topic 7: 164-165</p> <p>TE: Topic 5: 120A-123B, 124A-125B, 126A-127B, 136A-137B; Topic 7: 164A-165B</p>	4. find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express $36 + 8$ as $4(9 + 2)$.										
	Apply and extend previous understandings of numbers to the system of rational numbers.										
<p>SE/TE: Topic 10: 222-223</p> <p>TE: Topic 10: 222A-223B</p>	5 understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.										

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<p>SE/TE: Topic 9: 214-215; Topic 10: 222-223, 226-229, 246-249</p> <p>TE: Topic 9: 214A-215B; Topic 10: 222A-223B, 226A-229B, 246A-249B</p> <p>a. SE/TE: Topic 10: 222-223, 242-245 TE: Topic 10: 222A-223B, 242A-24BS5</p> <p>b. SE/TE: Topic 10: 242-245, 246-249 TE: Topic 10: 242A-245B, 246A-249B</p> <p>c. SE/TE: Topic 10: 222-223, 226-229, 246-249 TE: Topic 10: 222A-223B, 226A-229B, 246A-249B</p>	<p>6. understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.</p> <p>a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.</p> <p>b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.</p> <p>c. Find and position integers and other rational number on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.</p>										

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<p>SE/TE: Topic 10: 222-223, 224-225, 226-229, 242-245</p> <p>TE: Topic 10: 222A-223B, 224A-225B, 226A-229B, 242A-245B</p> <p>a. SE/TE: Topic 10: 224-225, 226-229</p> <p>TE: Topic 10: 224A-225B, 226A-229B</p> <p>b. SE/TE: Topic 10: 224-225, 226-229</p> <p>TE: Topic 10: 224A-225B, 226A-229B</p> <p>c. SE/TE: Topic 10: 222-223, 242-245</p> <p>TE: Topic 10: 222A-223B, 242A-245B</p> <p>d. SE/TE: Topic 10: 242-245</p> <p>TE: Topic 10: 24A2-245B, 258</p>	<p>7. understand ordering and absolute value of rational number.</p> <p>a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.</p> <p>b. Write, interpret, and explain statements of order for rational number in real-world contexts. For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C.</p> <p>c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars.</p> <p>d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.</p>							
<p>SE/TE: Topic 10: 246-249, 250-253</p> <p>TE: Topic 10: 246A-249B, 250A-253B</p>	<p>8. solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.</p>							

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	<p align="center">C. Expressions & Equations</p> <p align="center">Apply and extend previous understandings of arithmetic to algebraic expressions.</p>										
<p>SE/TE: Topic 1: 10-13</p> <p>TE: Topic 10: 10A-13B</p>	<p>1. write and evaluate numerical expressions involving whole-number exponents.</p>										
<p>SE/TE: Topic 2: 32-33, 46-47, 48-49, 50-53</p> <p>TE: Topic 2: 32A-33B, 46A-47B, 48A-49B, 50A-53B</p> <p>a. SE/TE: Topic 2: 32-33, 46-47 TE: Topic 2: 32A-33B, 46A-47B</p> <p>b. SE/TE: Topic 2: 32-33, 46-47 TE: Topic 2: 32A-33B, 46A-47B</p> <p>c. SE/TE: Topic 2: 46-47; Topic 3: 80-81, Topic 17: 426-429, 430-433, 434-437 TE: 46A-47B, 80A-81B, 426A-429B, 430A-433B, 434A-437B</p>	<p>2. write, read and evaluate expressions in which letters stand for numbers.</p> <p>a. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.</p> <p>b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.</p> <p>c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = \frac{1}{2}$</p>										

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<p>SE/TE: Topic 2: 34-35, 36-39, 40-41, 46-47; Topic 4: 96-97</p> <p>TE: Topic 2: 34A-35B, 36A-39B, 40A-41B, 46A-47B; Topic 4: 96A-97B</p>	<p>3. apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.</p>										
<p>SE/TE: Topic 4: 96-97</p> <p>TE: Topic 4: 96A-97B</p>	<p>4. identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</p>										
	Reason about and solve one-variable equations and inequalities.										
<p>SE/TE: Topic 3: 82-83; Topic 4: 98-101, 106-109; Topic 15: 386-389, 390-391</p> <p>TE: Topic 3: 82A-83B; Topic 4: 98A-101B, 106A-109B; Topic 15: 386A-389B, 390A-391B</p>	<p>5 understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p>										
<p>SE/TE: Topic 2: 32-33; Topic 3: 82-83; Topic 4: 98-101, 106-109</p> <p>TE: Topic 2: 32A-33B; Topic 3: 82A-83B; Topic 4: 98A-101B, 106A-109B</p>	<p>6 use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number or depending on the purpose at hand, any number in a specified set.</p>										

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<p>SE/TE: Topic 4: 98-101, 102-105, 106-109, 110-113; Topic 9: 212-213; Topic 15: 372-375; Topic 17: 426-429, 430-433, 434-437</p> <p>TE: Topic 4: 98A-101B, 102A-105B, 106A-109B, 110A-113B; Topic 9: 212A-213B; Topic 15: 372A-375B; Topic 17: 426A-429B, 430A-433B, 434A-437B</p>	7 solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.										
<p>SE/TE: Topic 15: 386-389</p> <p>TE: Topic 15: 386A-389B</p>	8. write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.										
	Represent and analyze quantitative relationships between dependent and independent variables.										
<p>SE/TE: Topic 11: 290-291; Topic 12: 310-313; Topic 15: 376-377, 378-379, 380-381, 382-385</p> <p>TE: Topic 11: 290A-291B; Topic 12: 310A-313B; Topic 15: 376A-377B, 378A-379B, 380A-381B, 382A-385B</p>	9. use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.										

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	<p>D. Geometry</p> <p>Solve real-world and mathematical problems involving area, surface area, and volume.</p>										
<p>SE/TE: Topic 8: 194-195; Topic 11: 266-269, 274-277, 278-281; Topic 17: 430-433, 434-437</p> <p>TE: Topic 8: 194A-195B; Topic 11: 266A-269B, 274A-277B, 278A-281B; Topic 17: 430A-433B, 434A-437B</p>	<p>1. find the area of right triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.</p>										
<p>SE/TE: Topic 18: 462-463, 464-465</p> <p>TE: Topic 18: 462A-463B, 464A-465B</p>	<p>2. find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l w h$ and $V = B h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</p>										
<p>SE/TE: Topic 10: 250-253; Topic 11: 262-265</p> <p>TE: Topic 10: 250A-253B; Topic 11: 262A-265B</p>	<p>3. draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</p>										

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SE/TE: Topic 17: 444-447; Topic 18: 454-457, 458-461, 466-469 TE: Topic 17: 444A-447B; Topic 18: 454A-457B, 458A-461B, 466A-469B	4. represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.										
E. Statistics & Probability Develop understanding of statistical variability.											
SE/TE: Topic 19: 476-477 TE: Topic 19: 476A-477B	1. recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.										
SE/TE: Topic 19: 478-479 TE: Topic 19: 478A-479B	2. understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.										
SE/TE: Topic 19: 480-481, 490-493, 500-501 TE: Topic 19: 480A-481B, 490A-493B, 500A-501B	3. recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.										

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	Summarize and describe distributions.											
SE/TE: Topic 19: 484-487, 488-489 TE: Topic 19: 484A-487B, 488A-489B	4. display numerical data in plots on a number line, including dot plots, histograms and box plots.											
SE/TE: Topic 19: 494-497, 498-499 TE: Topic 19: 494A-497B, 498A-499B a. SE/TE: Topic 19: 484-487, 498-499 TE: Topic 19: 484A-487B, 498A-499B b. SE/TE: Topic 19: 476-477, 498-499 TE: Topic 19: 476A-477B, 498A-499B c. SE/TE: Topic 19: 480-481, 482-483, 490-493, 498-499 TE: Topic 19: 480A-481B, 482A-483B, 490A-493B, 498A-499B d. SE/TE: Topic 19: 494-497, 498-499 TE: Topic 19: 494A-497B, 498A-499B	5. Summarize numerical data sets in relation to their context, such as by: <ol style="list-style-type: none"> reporting the number of observations. describing the nature of the attribute under investigation, including how it was measured and its units of measurement. giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. 											