

A Correlation of

INVESTIGATIONS  ©2017
IN NUMBER, DATA, AND SPACE®



to the

**West Virginia Evaluation Criteria
Grade 4**

**A Correlation of Investigations 3 in Number, Data, and Space ©2017
to the West Virginia Evaluation Criteria
Group VI Mathematics Grade 4**

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**NON-NEGOTIBLE EVALUATION CRITERIA
2018-2024
Group VI – Mathematics
Grade 4**

Equity, Accessibility and Format				
Yes	No	N/A	CRITERIA	NOTES
X			<p>1. INTER-ETHNIC The instructional materials meets the requirements of inter-ethnic: concepts, content and illustrations, as set by WV Board of Education Policy (Adopted December 1970).</p>	<p>Inter-ethnic representations are evident throughout the <i>Investigations3</i> program. Illustrations, activities, word-problems, assessments, examples, and extra materials include examples of different ethnicities and cultures. Students gain a sense that mathematics transcends differences in culture and ethnicity.</p> <p>See the following examples: Unit 1: 1.1, 1.2, 1.4, 1.7, 2.3 Unit 3: 1.4, 2.3 Unit 4: 2.1, 2.3, 2.4, 3.1, 4.4 Unit 5: 1.1, 1.3, 1.5, 2.5, 3.3</p>
X			<p>2. EQUAL OPPORTUNITY The instructional material meets the requirements of equal opportunity: concepts, content, illustration, heritage, roles contributions, experiences and achievements of males and females in American and other cultures, as set by WV Board of Education Policy (Adopted May 1975).</p>	<p>The <i>Investigations3</i> program offers examples of equal opportunity throughout each unit, lesson, example, and real-world problem. Boys and girls, men and women of different backgrounds and ethnicities are represented as achieving and contributing in equal ways in the classroom and to society.</p> <p>See the following examples: Unit 1: 1.7, Unit 3: 2.2, 2.4 Unit 5: 1.1, 1.5 Unit 6: 2.2, 2.3, 2.7</p>

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Equity, Accessibility and Format				
Yes	No	N/A	CRITERIA	NOTES
X			<p>3. FORMAT This resource is available as an option for adoption in an interactive electronic format.</p>	<p>In addition to the physical textbook version, <i>Investigations3</i> is also available for grades K-5 at SavvasRealize.com. Throughout the program, students are engaged in the main math concepts of each lesson which include viewing and making digital presentations, engaging videos, digital tools, interactive games, and online assessments.</p>
X			<p>4. BIAS The instructional material is free of political bias.</p>	<p>The instructional material consists of an integration of mathematical content and practices, including contextual and cross-curricular applications that is free from political bias. Students are given opportunities to explore and express their own feelings and perspectives, but there is no political commentary or philosophical bias embedded in the program content or presentation.</p>

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**GENERAL EVALUATION CRITERIA
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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 and eighty percent of the specific criteria must be met with I (in-depth) or A (adequate) in order to be recommended.

(Vendor/Publisher) SPECIFIC LOCATION OF CONTENT WITHIN PRODUCTS	(IMR Committee) Responses						
	I=In-depth, A=Adequate, M=Minimal, N=Nonexistent			I	A	M	N
	<i>In addition to alignment of Content Standards, materials must also clearly connect to Learning for the 21st Century which includes opportunities for students to develop:</i>						
Use Problem Solving Skills							
<i>For student mastery of content standards, the instructional materials will include multiple strategies that provide students with opportunities to:</i>							
<p><i>Investigations3</i> guides students in making sense of new mathematical content. “Classroom Routines and Math Workshops” provide opportunities for students to interact with the concepts and discover the best path to solving problems.</p> <p>See the following examples: Unit 1: 1.1, 1.5, 1.6, 1.8, 2.1 Unit 7: 1.1, 1.3, 1.6, 1.7, 2.1, 2.2, 3.3, 3.4</p>	<p>1. Make sense of problems and persevere in solving them;</p>						

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<p>Mathematical precision is used in solving problems, labeling representations, and using proper vocabulary when communicating ideas. In <i>Investigations3</i>, students are required to use precise calculations as well as precise language when describing their processes.</p> <p>See the following examples: Unit 4: 1.2, 1.3, 1.4, 1.5, 2.3, 3.1, 3.3, 4.1, 4.3, 4.4, 4.5 Unit 6: 1.1, 1.4, 1.6, 2.1, 2.3, 2.5, 2.8, 3.1, 4.1, 4.2, 4.3</p>	2. attend to precision;							
<p>Each session includes hands-on activities that are both student and teacher directed. Students build upon their prior knowledge as they add new concepts to more complicated problem situations.</p> <p>See the following examples: Unit 2: 1.1, 1.3, 1.5, 2.2, 2.4, 2.5, 2.6 Unit 5: 1.2, 1.4, 1.6, 2.2, 2.3, 2.7, 3.1, 3.2, 3.5, 3.6 Unit 7: 1.2, 1.3, 1.4, 1.6, 1.7, 2.2, 2.3, 2.4, 2.5, 3.2, 3.4, 3.6 Unit 8: 1.1, 1.3, 1.4, 1.6, 1.7, 1.9, 1.10</p>	3. deepen understanding through meaningful and challenging teacher and/or student directed inquiry-based learning that builds number sense using prior knowledge and promotes interdisciplinary connections;							

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<p>Each session in <i>Investigations3</i> includes real-world problems where students learn to contextualize the quantities in the problems and relate those quantities to the sought solution. Students learn to interpret symbols as having meaning and effect upon the numbers in the problem. Teacher materials guide educators in asking questions and deepening students' process of reasoning.</p> <p>See the following examples: Unit 3: 1.1, 1.4, 2.1, 2.2, 2.3, 3.3 Unit 7: 1.2, 1.4, 1.5, 2.1, 2.4, 2.5, 3.1, 3.5</p>	4. reason abstractly and quantitatively;							
<p><i>Investigations3</i> cultivates students' ability to explain their own reasoning and discuss that of others. Students are encouraged to communicate their mathematical process and solutions both in written and verbal form. As students work through each grade of this curriculum, they mature in their ability to construct viable arguments.</p> <p>See the following examples: Unit 2: 1.2, 1.4, 1.5, 2.4, 2.5 Unit 6: 1.1, 1.2, 1.5, 1.6, 2.2, 2.4, 2.5, 2.6, 3.3, 3.6, 4.1, 4.3</p>	5. construct viable arguments and critique the reasoning of others							

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<p><i>Investigations3</i> helps students to reach outside of themselves as well as outside of the classroom to apply mathematics to real-world contexts. Each session gives students the opportunity to use both digital resources and real-world examples to solidify the concept.</p> <p>See the following examples: Unit 2: 1.1, 1.3, 1.4, 1.5, 2.1, 2.3, 2.5, 2.6 Unit 3: 1.2, 1.4, 1.5, 2.2, 2.6, 3.2, 3.4, 3.6, 3.7 Unit 6: 1.1, 1.3, 1.4, 1.6, 2.1, 2.3, 2.5, 2.8, 3.1, 3.3, 3.5, 4.2, 4.3, 4.4 Unit 7: 1.2, 1.3, 1.5, 2.1, 2.3, 2.4, 3.3, 3.5, 3.6</p>	<p>6. make informed choices by interacting with outside resources through opportunities for local and global collaboration in a variety of safe venues</p>							
<p>Each session in <i>Investigations3</i> includes opportunities for students to learn from mathematical models as well as create their own mathematical models. Students relate geometric shapes to real-world objects, create tables and graphs, and draw pictures to represent mathematical problems. As students apply these models to their knowledge of the math concepts, they solidify their understanding.</p> <p>See the following examples: Unit 2: 1.1, 1.5, 2.1, 2.4 Unit 8: 1.2, 1.3, 1.5, 1.6, 1.7, 1.9</p>	<p>7. model with mathematics;</p>							

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		I	A	M	N	
<p>Students use a variety of tools to support their work in understanding each mathematical concept. <i>Investigations3</i> helps students to select and utilize the appropriate tools to effectively solve each problem.</p> <p>See the following examples: Unit 4: 1.1, 1.3, 1.4, 1.5, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.4 Unit 5: 1.2, 1.3, 1.4, 1.6, 2.1, 2.2, 2.4, 2.5, 3.1, 3.6</p>	<p>8. use appropriate tools strategically;</p>					
<p><i>Investigations3</i> provides a variety of digital resources to help students engage in each session's topic. Throughout the program, students utilize technology concepts which include viewing and making digital presentations, engaging videos, digital tools, interactive games, and online assessments.</p> <p>See the following examples: Unit 1: 1.1, 1.3, 1.4, 1.5, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4 Unit 3: 1.1, 1.3, 1.5, 2.3, 2.4, 2.6, 3.2, 3.3, 3.4 Unit 4: 1.2, 1.3, 1.4, 1.5, 2.1, 2.3, 2.5, 3.2, 3.4, 4.1, 4.3, 4.5, 4.6 Unit 5: 1.3, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 2.5, 2.7, 3.3, 3.4, 3.5</p>	<p>9. use appropriate technology tools for a variety of purposes</p>					

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<p><i>Investigations</i>3 guides students in recognizing the structure of the mathematical concepts in each session. Students learn to use structures such as place value, properties of operations, and attributes of shapes to gain a comprehensive understanding.</p> <p>See the following examples: Unit 3: 1.1, 1.3, 2.1, 2.5, 3.1, 3.2, 3.4, 3.5, 3.6 Unit 5: 1.1, 1.2, 1.4, 1.5, 1.6, 2.2, 2.3, 2.4, 3.1, 3.2, 3.4</p>	10. look for and make use of structure							
<p>Throughout each unit and session, students engage in routines and games that, over time, allow the students to notice regularities in related problems. Students are encouraged to verbalize and discuss these findings and utilize their new discoveries with similar mathematical problems.</p> <p>See the following examples: Unit 1: 1.2, 1.3, 1.6, 2.1, 2.2 Unit 8: 1.1, 1.2, 1.5, 1.6, 1.7, 1.8</p>	11. look for and express regularity in repeated reasoning.							

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Personal and Workplace Productivity Skills					
<i>For student mastery of content standards, the instructional materials will include multiple strategies that provide students with opportunities to:</i>					
<p>Students engage with each other as teachers lead them through discussions, activities, games, and projects. Students have opportunities to work with both partners and groups to find solutions to problems.</p> <p>See the following examples: Unit 2: 1.1, 1.3, 1.5, 2.2, 2.4, 2.5, 2.6 Unit 5: 1.2, 1.4, 1.6, 2.2, 2.7, 3.1, 3.5, 3.6 Unit 7: 1.2, 1.3, 1.4, 1.7, 2.2, 2.4, 2.5, 3.2, 3.6 Unit 8: 1.1, 1.3, 1.4, 1.6, 1.9, 1.10</p>	<p>12. work collaboratively;</p>				
<p><i>Investigations3</i> helps students to build time-management skills as they complete activities and projects (both individual and with partners) in the time allotted. Students also experience time-management throughout the session as each lesson progresses from “Classroom Routine” to the “Activity” to the “Math Workshop” to “Review and Practice.”</p> <p>See the following examples: Unit 1: 1.1, 1.3, 1.4, 1.5, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4 Unit 3: 1.1, 1.3, 1.5, 2.3, 2.4, 2.6, 3.2, 3.3, 3.4 Unit 4: 1.2, 1.3, 1.4, 1.5, 2.1, 2.3, 2.5, 3.2, 3.4, 4.1, 4.3, 4.5, 4.6</p>	<p>13. practice time-management and project management skills in problem-based learning situations.</p>				

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Developmentally Appropriate Instructional Resources and Strategies					
<i>For student mastery of content standards, the instructional materials:</i>					
<p><i>Investigations3</i> devotes the majority of instruction to the critical areas in each grade. Critical concepts are taught, then integrated into later units and lessons. Grade 4 critical areas include developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends, developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers, understanding that geometric figures can be analyzed and classified based on their properties.</p> <p>See the following examples: Unit 3: 1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.4, 2.5, 2.6, 3.1, 3.3, 3.5, 3.7 Unit 4: 1.2, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 4.1, 4.3, 4.5, 4.6 Unit 5: 1.3, 1.5, 1.6, 2.2, 2.5, 2.6, 2.7, 3.4, 3.5, 3.6 Unit 6: 1.1, 1.2, 1.5, 1.6, 3.1, 3.3, 3.4, 3.5, 3.6, 4.1, 4.2, 4.3, 4.4 Unit 7: 1.1, 1.3, 1.5, 1.6, 1.7, 2.3, 2.4, 2.5, 3.2, 3.3, 3.4, 3.5, 3.6</p>	<p>14. are designed to devote the large majority of time to the critical areas of the grade as noted in the narrative written above the grade level standards;</p>				

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<p>Each mathematical concept is used throughout the units in each grade in order to create tangible connections between activities and real-world application. Students engage with the concepts through games, activities, problems, discussion, and technology.</p> <p>See the following examples: Unit 1: 1.1, 1.2, 1.3, 1.5, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4 Unit 3: 1.1, 1.2, 1.3, 1.4, 1.5, 2.2, 2.3, 2.5, 2.6, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 6: 1.1, 1.3, 1.4, 1.5, 1.6, 2.1, 2.5, 2.6, 2.8, 3.1, 3.3, 3.5, 3.6, 4.1, 4.2, 4.3, 4.4 Unit 7: 1.1, 1.3, 1.5, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 3.2, 3.3, 3.4, 3.5, 3.6</p>	<p>15. include suggestions for appropriate scaffolding and provide opportunities to engage in high interest, age-appropriate activities that simulate real-life situations, and make cross-curricular, global connections;</p>							

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<p><i>Investigations3</i> provides students with hands-on, engaging activities. Students are able to experience the concepts as they are learning. Students connect visually to printed pictures, graphs, charts, videos, etc. They also learn kinesthetically as they use manipulatives such as connecting cubes, attribute blocks, drawing utensils, and measuring devices.</p> <p>See the following examples: Unit 2: 1.3, 1.4, 1.5, 2.2, 2.3, 2.4, 2.5, 2.6 Unit 3: 1.2, 1.3, 1.4, 1.5, 2.3, 2.4, 2.6, 3.1, 3.7 Unit 5: 2.4, 2.6, 2.7, 3.1, 3.3, 3.4, 3.5, 3.6 Unit 8: 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.10</p>	<p>16. provide students with opportunities to use print, graphs, visual displays, developmentally appropriate manipulatives, media and technology sources to acquire and apply new information;</p>							

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<p>Students are encouraged to use precise vocabulary when engaging in activities, discussions, and problem-solving experiences. Each session has a list of vocabulary words included and students use these words throughout the session as well as in future mathematical activities.</p> <p>See the following examples: Unit 1: 1.1, 1.2, 1.3, 1.4, 1.7 Unit 5: 1.1, 2.2, 3.3 Unit 6: 1.1, 1.2, 1.4 Unit 8: 1.1, 1.3</p>	<p>17. include best practices that emphasize the importance of authentic vocabulary acquisition using multiple methods and modes that motivate and increase vocabulary skills;</p>							
<p><i>Investigations3</i> is uniquely designed for students of all learning types and levels. Teacher's materials include a number of sections in each session titled "Differentiation." These sections offer support for a range of learners. Interventions for students who need extra help as well as extension opportunities for students who need further challenge are all included in each session.</p> <p>See the following examples: Unit 2: 1.1, 1.3, 2.3, 2.4, 2.6 Unit 3: 1.1, 1.2, 1.4, 2.1, 2.2, 2.5, 3.5, 3.6 Unit 6: 1.1, 1.3, 1.4, 1.6, 2.2, 2.3, 2.4, 2.7, 3.1, 3.2 Unit 8: 1.1, 1.2, 1.3, 1.4, 1.6, 1.9, 1.10</p>	<p>18. support personalized learning through intervention and enrichment activities;</p>							

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<p>Teachers and students have an array of interactive digital resources available to them through the Investigations3 program. www.savvasrealize.com is full of activities, games, practice problems, assessments, and other enhancements that aid teachers in creating a learning experience for students.</p>	<p>19. provide a dynamic, interactive website for students to access electronic resources (i.e., podcasts, videos, skill-based games, etc.). The media included in the instructional materials must enhance and support instruction and learning;</p>							
<p>The teacher's edition of each unit includes, at the end of the book, a section labeled, "Professional Development." With this resource, teachers have the opportunity to enhance their own skills in teaching each concept. Teachers also have access to a multitude of resources through www.savvasrealize.com.</p>	<p>20. include a professional resource that builds content and pedagogical knowledge for the teacher.</p>							

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Assessment					
<p>All assessments in the <i>Investigations3</i> program are available in print and digital format. Teachers are guided in assessing students through observing their work, observing their ability to communicate the concept accurately, and achieving pre-set benchmarks which have been assigned to each unit. Specific activities throughout the units are marked as “Portfolio Opportunities” which are collected from each student so that the teacher can have an accurate sample of student work to assess. Students are assessed throughout each unit and at the end of each investigation.</p> <p>See the following examples: Unit 2: 1.4, 2.4, 2.5 Unit 4: 1.2, 1.4, 2.4, 3.4, 4.4, 4.5 Unit 6: 1.1, 1.4, 1.6, 2.1, 2.3, 2.5, 2.8, 3.1, 4.1, 4.2, 4.3 Unit 8: 1.1, 1.3, 1.6, 1.8</p>	<p>21. Instructional materials provide tools for a balanced approach to assessment including diagnostic, formative and summative assessments in multiple formats (i.e., rubrics, performance tasks, open-ended questions, portfolio evaluation, and multimedia simulations).</p>				

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Organization, Presentation and Format					
<p>Each Grade is organized into Units, Investigations, and Sessions. Sessions include numerous interactive activities, games, and other hands-on experiences. The teacher's edition includes multiple suggestions for teaching each concept in a way that is motivational and engaging.</p> <p>See the following examples: Unit 4: 1.2, 1.4, 1.5, 2.1, 2.4, 2.5, 3.1, 3.2, 4.3, 4.5, 4.6 Unit 5: 1.3, 1.5, 2.6, 2.7, 3.4, 3.5, 3.6 Unit 6: 1.1, 1.2, 1.5, 1.6, 3.1, 3.3, 3.4, 3.5, 3.6, 4.4 Unit 7: 1.1, 1.3, 1.7, 2.3, 2.4, 2.5, 3.2, 3.3, 3.6</p>	<p>22. Information is organized logically and presented clearly using multiple methods and modes for delivering differentiated instruction that motivates and increases numeracy as students engage in high interest, authentic activities.</p>				
<p>The student e-text is available at www.savvasrealize.com. In addition to the student edition text, they can access videos, teacher presentations, assessments, games, math tools, and other online resources.</p>	<p>23. Instructional materials include an electronic file of the student edition provided on an electronic data storage device (e.g., CD, DVD, USB drive, etc.) and through a link on the publisher's server, both of which are accessible by an internet-enabled device that can open standard file formats.</p>				

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<p>Each new unit includes a “Family Letter” that is sent home to engage parents in the new topics and concepts. Parents are encouraged to have conversations with their students and involve themselves in the homework process. Receiving support from home as well as in the classroom is crucial to the mathematical success of each student.</p> <p>See the following examples: Unit 3: 1.1 Unit 6: 1.1 Unit 7: 1.1 Unit 8: 1.1, 1.2</p>	<p>24. The materials engage parents in appropriate ways. For example, homework assignments in elementary grades consists of routine problems, practice with getting answers and fluency-building exercises that parents can easily support.</p>							

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SPECIFIC EVALUATION CRITERIA

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All West Virginia teachers are responsible for classroom instruction that integrates content standards and mathematical habits of mind. Students in the fourth grade will focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry. Mathematical habits of mind, which should be integrated in these content areas, include: making sense of problems and persevering in solving them, reasoning abstractly and quantitatively; constructing viable arguments and critiquing the reasoning of others; modeling with mathematics; using appropriate tools strategically; attending to precision, looking for and making use of structure; and looking for and expressing regularity in repeated reasoning. Continuing the skill progressions from third grade, the following chart represents the mathematical understandings that will be developed in fourth grade:

Operations and Algebraic Thinking	Number and Operations in Base Ten
<ul style="list-style-type: none"> • Use whole-number arithmetic to solve word problems, including problems with remainders and problems with measurements. • Add and subtract whole numbers quickly and accurately (numbers up to 1 million). • Multiply and divide multi-digit numbers in simple cases (e.g., multiplying $1,638 \times 7$ or 24×17, and dividing 6,966 by 6). • Gain familiarity with factors and multiples. • Generate and analyze patterns. 	<ul style="list-style-type: none"> • Generalize place value understanding for multi-digit whole numbers. • Use place value understanding and properties of operations to perform multi-digit arithmetic.
Number and Operations- Fractions	Measurement and Data
<ul style="list-style-type: none"> • Use equivalent fractions to understand and order fractions (e.g., recognize that $\frac{1}{4}$ is less than $\frac{3}{8}$ because $\frac{2}{8}$ is less than $\frac{3}{8}$). • Add, subtract, and multiply fractions in simple cases (such as $2\frac{3}{4} - 1\frac{1}{4}$ or $3 \times \frac{5}{8}$), and solve related word problems. • Understand and compare simple decimals in terms of fractions (e.g., rewriting 0.62 as $\frac{62}{100}$). 	<ul style="list-style-type: none"> • Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. • Represent and interpret data. • Geometric measurement: understand concepts of angle and measure angles.
Geometry	
<ul style="list-style-type: none"> • Draw and identify lines and angles, and classify shapes by properties of their lines and angles. • Measure angles and find unknown angles in a diagram. 	

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For student mastery of content standards, the instructional materials will provide students with the opportunity to

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Operations and Algebraic Thinking					
Use the four operations with whole numbers to solve problems.					
Unit 1: 1.5, 1.6, 1.8 SAB 21-22, 23, 25, 45, 73	1. Interpret a multiplication equation as a comparison (e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.				
Unit 1: 1.5, 1.6, 1.8 Unit 3: 2.4, 3.6 SAB: 102-103	2. Multiply or divide to solve word problems involving multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem) and distinguish multiplicative comparison from additive comparison.				
Unit 3: 1.1, 2.2 Unit 5: 3.3, 3.4, 3.5, 3.6 Unit 7: 1.2, 3.4, 3.5, 3.6 Unit 8: 1.1, 1.2, 1.4, 1.7, 1.8, 1.10 SAB 41, 108, 329-330, 320=-322, 325-328, 451-452, 491-492	3. Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.				
Gain familiarity with factors and multiples.					
Unit 1: 1.1, 1.2, 1.3, 1.4, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4 Unit 3: TMM 1.4, TMM 2.1, TMM 2.2, TMM 3.1, 3.1, TMM 3.2, TMM 3.3 SAB 24, 27, 31, 37, 43-44, 51, 59, 72, 84, 117, 124, 129, 150	4. Find all factor pairs for a whole number in the range 1–100, recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.				

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Generate and analyze patterns.						
Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10 SAB 507-508, 510, 513-515, 516, 519-520, 523-524, 525, 527, 533-536, 537-538, 545, 546, 547, 551-552, 553, 554	5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. (e.g., Given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.)					
Number and Operations in Base Ten						
Generalize place value understanding for multi-digit whole numbers.						
Unit 5: 3.1, 3.2 Unit 6: 1.4	6. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right (e.g., recognize that $700 \div 70 = 10$ by applying concepts of place value and division).					
Unit 5: TMM 1.1, TMM 2.4, 3.1, 3.2, 3.3 Unit 6: TMM 1.1, TMM 1.2, TMM 1.3, TMM 1.4, TMM 1.5, TMM 1.6, TMM 3.1, TMM 3.2, TMM 3.3, TMM 3.4, TMM 3.5, TMM 3.6 SAB 318, 324, 331, 337, 370	7. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$ and $<$ symbols to record the results of comparisons.					
Unit 5: TMM 1.1, TMM 2.4, TMM 3.3 Unit 6: TMM 1.1, TMM 1.2, TMM 1.3, TMM 1.4, TMM 1.5, TMM 1.6, TMM 3.1, TMM 3.2, TMM 3.3, TMM 3.4, TMM 3.5, TMM 3.6 Unit 8: TMM 1.1, TMM 1.2, TMM 1.3, TMM 1.4, TMM 1.5 SAB 318, 323, 324, 331, 333, 370	8. Use place value understanding to round multi-digit whole numbers to any place.					

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Use place value understanding and properties of operations to perform multi-digit arithmetic.								
Representative examples: Unit 4 TMM 1.1, TMM 1.3, TMM 1.4, TMM 3.2, TMM 3.3, TMM 3.4 Unit 5: 1.1, 1.2, 1.4, 1.5, 1.6, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.4, 3.5, 3.6 SAB 261-262, 267-268, 269, 270, 278, 279, 280-281, 286-287, 288, 291-292, 293, 295, 298-299, 300, 304, 305-306, 307-308, 332, 335, 361, 376, 378	9. Fluently add and subtract multi-digit whole numbers using the standard algorithm.							
Representative examples: Unit 3: Investigation 1, 2.4, 2.6, 3.2, 3.3, 3.4, 3.5, 3.6 Unit 5: TMM 1.4, TMM 2.5, TMM 2.7, TMM 3.6 Unit 7: 1.3, 1.4, 1.5, 1.6, 1.7, Investigation 2, 3.5, 3.6 SAB 101, 102-103, 104, 105, 121-123, 142-143, 147-148, 149, 443-444, 445, 446, 455, 457, 460, 467-468, 469, 474, 480, 517, 531, 532	10. Multiply a whole number of up to four digits by a one-digit whole number, multiply two two-digit numbers, using strategies based on place value and the properties of operations and illustrate and explain the calculation by using equations, rectangular arrays and/or area models.							
Unit 3: 2.1, 2.2, 2.3, 2.4, 2.5, 3.7 Unit 7: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 SAB 106-107, 109, 111-112, 113, 114, 115-116, 119, 121-123, 141, 145, 475, 477-478, 484-485, 487-488, 489, 493, 497, 509, 521, 531	11. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays and/or area models.							

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Number and Operations - Fractions								
Extend understanding of fraction equivalence and ordering.								
Unit 6: 1.1, 1.2, 1.3, 1.5, 1.6, 2.3, 2.4, 2.8 SAB 348-349, 360, 363, 367, 371, 453	12. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.							
Unit 6: 2.3, 2.4, 2.5, 2.6 SAB 373, 381, 409, 448	13. Compare two fractions with different numerators and different denominators (e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$). Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$ or $<$, and justify the conclusions by using a visual fraction model.							
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.								
Unit 6: 3.1, 3.2, 3.3, 3.4, 4.2, 4.3, 4.4 SAB 387, 388-389, 390, 391, 393, 394, 395-396, 397, 399-400, 401, 404, 418, 420 a. Unit 6: 1.1, 1.2, 3.1, 3.2, 3.3, 3.4 b. Unit 6: 1.1, 2.1, 2.2, 3.1 c. Unit 6: 3.3, 3.4, 4.2, 4.3, 4.4	14. Understand the fraction a/b , with $a > 1$, as the sum of a of the fractions $1/b$. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation and justify decompositions by using a visual fraction model (e.g., $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2 \frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$). c. Add and subtract mixed numbers with like denominators by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction.							

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d. Unit 6: 3.1, 3.2, 3.3, 3.4, 4.2, 4.3, 4.4	d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators by using visual fraction models and equations to represent the problem.					
Unit 6: 4.1, 4.2, 4.3, 4.4 SAB 411-412, 413, 414-415, 416, 418, 419, 420, 423	15. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.					
a. Unit 6: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 4.1, 4.2, 4.3, 4.4	a. Understand a fraction a/b as a multiple of $1/b$, (e.g., use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$).					
b. Unit 6: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 4.1, 4.2, 4.3, 4.4	b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number (e.g., use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. In general, $n \times (a/b) = (n \times a)/b$).					
c. Unit 6: 4.1, 4.2, 4.3, 4.4	c. Solve word problems involving multiplication of a fraction by a whole number by using visual fraction models and equations to represent the problem (e.g., If each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?).					
Understand decimal notation for fractions and compare decimal fractions.						
Unit 6: 1.4, 1.5, 3.5 SAB 358-359, 362, 364	16. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100 (e.g., express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$). Instructional Note: Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.					

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Unit 6: 1.4, 1.5, 1.6, 2.7, 2.8 SAB 358-359, 362, 364	17. Use decimal notation for fractions with denominators 10 or 100 (e.g., rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram).							
Unit 6: 2.7, 2.8 SAB 384, 408	18. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$ or $<$, and justify the conclusions by using a visual model.							
Measurement and Data								
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.								
Unit 4: 1.1, 1.2, 1.3 Unit 7: 1.1, 1.2 SAB 151, 153, 161, 167, 174-175, 183, 427-428, 429, 435	19. Know relative sizes of measurement units within a system of units, including the metric system (km, m, cm; kg, g; l, ml), the standard system (lb, oz), and time (hr, min, sec.). Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. (e.g., Know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...)							
Unit 4: 1.4, 1.5 Unit 6: 3.1, 3.5, 3.6 SAB 29, 261-262, 433-434, 436, 459	20. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.							
Unit 4: 1.4, 1.5, 4.4, 4.5, 4.6 SAB 173, 179-180, 181, 253-254, 257	21. Apply the area and perimeter formulas for rectangles in real world and mathematical problems by viewing the area formula as a multiplication equation with an unknown factor. (e.g., find the width of a rectangular room given the area of the flooring and the length.)							

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Represent and interpret data.						
Unit 2: TMM 1.5, 2.2, TMM2.5, 2.5, TMM 2.6 SAB 81-82, 85, 91, 398, 403, 407	22. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots (e.g., from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection).					
Geometric measurement: understand concepts of angle and measure angles.						
Unit 4: 3.1, 3.3, 3.4 SAB 209 a. Unit 4: 3.3 b. Unit 4: 3.1, 3.3	23. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles. b. An angle that turns through b one-degree angles is said to have an angle measure of b degrees.					
Unit 4: 3.3, 3.4 SAB 213-215, 219, 222, 223-224, 225, 227-229, 232, 255, 256	24. Measure angles in whole-number degrees using a protractor and sketch angles of specified measure.					
Unit 4: 3.2, 3.4 SAB 211-212	25. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems (e.g., by using an equation with a symbol for the unknown angle measure).					

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Geometry								
Draw and identify lines and angles and classify shapes by properties of their lines and angles.								
Unit 4: 2.1, 2.2, 2.5, 3.1 SAB 186, 205, 210, 225, 243	26. Draw points, lines, line segments, rays, angles (right, acute, obtuse) and perpendicular and parallel lines. Identify these in two-dimensional figures.							
Unit 4: 2.1, 2.2, 2.3, 2.4, 2.5 SAB 193, 196-198, 203, 208	27. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.							
Unit 4: 4.1, 4.2, 4.3 SAB 233, 236, 239, 240-241	28. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.							