

Mathematics, Grade 6

Time on Task: 3.5 hours per week

Course Philosophy

Mathematics demonstrates God’s order even in an abstract world, gradually building a base of knowledge and skills beginning with the simplest concepts to the more complex. In mathematics, the student will see the order and truth that God created. Just as the Bible says, “precept upon precept, line upon line....” (Isaiah 23:10) The sequential mastery of mathematical concepts is the primary objective.

Course Description

Within a well-balanced mathematics curriculum, the primary focal points at Grade 6 are using ratios to describe direct proportional relationships involving number, geometry, measurement, probability, and adding and subtracting decimals and fractions.

Goals and Objectives	Scope and Sequence	Spiritual Goals
<p>Texas Essential Knowledge and Skills (TEKS)</p> <p>§111.22. Mathematics, Grade 6.</p> <p>(a) Introduction.</p> <p>(1) Within a well-balanced mathematics curriculum, the primary focal points at Grade 6 are using ratios to describe direct proportional relationships involving number, geometry, measurement, probability, and adding and subtracting decimals and fractions.</p> <p>(2) Throughout mathematics in Grades 6-8, students build a foundation of basic understandings in number, operation, and quantitative reasoning; patterns, relationships, and algebraic thinking; geometry and spatial reasoning; measurement; and probability and statistics. Students use concepts, algorithms, and properties of rational numbers to explore mathematical relationships and to describe increasingly complex situations. Students use algebraic thinking to describe how a change in one quantity in a relationship results in a change in the other; and they connect verbal, numeric, graphic, and symbolic representations of relationships. Students use geometric properties and relationships, as well as spatial reasoning, to model and analyze situations and solve problems. Students communicate information about geometric figures or situations</p>	<ul style="list-style-type: none">• Numeration<ul style="list-style-type: none">○ Digits○ Reading and writing numbers○ Ordinal numbers○ Place value○ Number line○ Expanded notation• Operations<ul style="list-style-type: none">○ Addition○ Subtraction○ Multiplication○ Division○ Powers○ Roots○ Mastering basic facts○ Order of operations○ Inverse operations• Fraction Concepts<ul style="list-style-type: none">○ Fractions and mixed numbers○ Decimals○ Percents	<p>God’s intended purpose for mathematics:</p> <ol style="list-style-type: none">1. To teach the child that there is logic and order in arithmetic and that there is logic and order in God’s plan.2. To teach that God cares for numbers and has recorded many for our information.3. To teach that God commanded men to count, measure, and record information.4. To teach the child that God is concerned that we be accurate and orderly in our use of weights, measure, and numbers.5. To teach the child not to place too much confidence in the size.6. To teach the child the concept of measurement to express men’s failure and His plans for man.7. To develop skills in reasoning which reveal truth.8. To understand that God has given

<p>by quantifying attributes, generalize procedures from measurement experiences, and use the procedures to solve problems. Students use appropriate statistics, representations of data, reasoning, and concepts of probability to draw conclusions, evaluate arguments, and make recommendations.</p> <p>(3) Problem solving in meaningful contexts, language and communication, connections within and outside mathematics, and formal and informal reasoning underlie all content areas in mathematics. Throughout mathematics in Grades 6-8, students use these processes together with graphing technology and other mathematical tools such as manipulative materials to develop conceptual understanding and solve problems as they do mathematics.</p>	<ul style="list-style-type: none"> ○ Ratio and Proportions ○ Rates • Estimation <ul style="list-style-type: none"> ○ Rounding whole numbers ○ Rounding decimals ○ Rounding mixed numbers ○ Estimating sums ○ Estimating differences ○ Estimating products ○ Estimating quotients ○ Estimating roots ○ Using estimation to verify reasonableness of calculations ○ Deciding whether an exact answer or approximate answer is desired • Number Theory <ul style="list-style-type: none"> ○ Fact families ○ Even and odd ○ Factors, multiples, and divisibility ○ Prime and composite numbers ○ Greatest common factor (GCF) ○ Least common multiple (LCM) ○ Divisibility tests ○ Prime factorization • Number Sets and Number Systems 	<p>man the ability to observe reality.</p> <ol style="list-style-type: none"> 9. To understand that God has given man the ability to explore and to formulate relationships. 10. To understand that human reasoning is a reflection of the divine. 11. To appreciate the structure, form, and beauty of God’s creation. 12. To appreciate the complexity and precision of God’s creation 13. To improve the student’s reasoning skills to help hi think less like the world and more like God. 14. To cultivate preciseness in Calculations and reasoning powers. 15. To develop an appreciation for correctness of procedure and accuracy in dealing with facts. 16. To make him aware of his own limitations and need to depend upon the Lord for understanding. 17. To develop skills in thrift and good stewardship to prepare him for successful living in the world. <p>Biblical Integration Truth Statements</p> <ol style="list-style-type: none"> 1. <i>What is prime reality, the really real?</i> God exists and is the ultimate reality. (Psalm 90:2, Revelation 22:13) <ol style="list-style-type: none"> a. God designed, created, and sustains His creation. (Genesis 1:1-31) b. God is good, holy, and loving. (Luke 18:19, 1 John 4:16, 1 Peter 1:16, Psalm 145:12)
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<p>(b) Knowledge and skills.</p> <p>(6.1) Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. <i>The student is expected to:</i></p> <ul style="list-style-type: none"> (A) compare and order non-negative rational numbers; (B) generate equivalent forms of rational numbers including whole numbers, fractions, and decimals; (C) use integers to represent real-life situations; (D) write prime factorizations using exponents; (E) identify factors of a positive integer, common factors, and the greatest common factor of a set of positive integers; and (F) identify multiples of a positive integer and common multiples and the least common multiple of a set of positive integers. <p>(6.2) Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve problems and justify solutions.</p>	<ul style="list-style-type: none"> ○ Counting numbers (natural numbers) ○ Whole numbers ○ Decimal number system ○ Negative numbers ○ Integers ○ Irrational numbers ○ Roman numerals <p>Correlation with TEKS <u>Saxon Math 7/6</u> Saxon/Houghton Mifflin Harcourt Company Student ISBN 1-56577-507-4 Teacher ISBN 1-59141-249-8 Vol. I 1-59141-250-1 Vol. II</p> <p>Lessons 9, 44, 56 Lesson 99</p> <p>Lesson 14 Lesson 65 Lessons 19, 20</p> <p>Lessons 25, 30</p>	<ul style="list-style-type: none"> c. God is omniscient – all knowing. (Romans 11:33-36, Psalm 147:5) d. God is sovereign – nothing is beyond His ultimate interest, control, and authority. (Daniel 4:25) e. God is personal and also triune- He is coequally and coeternally God the Father, God the Son, Jesus, and God the Holy Spirit. (Hebrews 1:3) <p>2. <i>What is the nature of external reality, that is, the world around us?</i></p> <ul style="list-style-type: none"> a. God is the source of everything and created the universe out of nothing. (Genesis 1:1) b. The universe was created by God to be orderly. (Isaiah 45:18, Psalm 147:4) c. God is constantly involved in the unfolding pattern of the ongoing operation of the universe. (Psalm 24:1-2, Psalm 32:13-15) d. The universe reflects His glory. (Psalm 8:1, Psalm 19:1) <p>3. <i>What is a human being?</i></p> <ul style="list-style-type: none"> a. God created humans to know Him intimately and to have a loving relationship with Him. (Psalm 100:3) b. Human beings are created in the image of God with the capacity to choose. (Genesis 1:27, Proverbs 8:10) c. Adam and Eve chose disobedience and brought death to themselves and sin entered the
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<p><i>The student is expected to:</i></p> <p>(A) model addition and subtraction situations involving fractions with objects, pictures, words, and numbers;</p> <p>(B) use addition and subtraction to solve problems involving fractions and decimals;</p> <p>(C) use multiplication and division of whole numbers to solve problems including situations involving equivalent ratios and rates;</p> <p>(D) estimate and round to approximate reasonable results and to solve problems where exact answers are not required; and</p> <p>(E) use order of operations to simplify whole number expressions (without exponents) in problem solving situations.</p> <p>(6.3) Patterns, relationships, and algebraic thinking. The student solves problems involving direct proportional relationships.</p> <p><i>The student is expected to:</i></p> <p>(A) use ratios to describe proportional situations;</p> <p>(B) represent ratios and percents with concrete models, fractions, and decimals; and</p> <p>(C) use ratios to make predictions in proportional situations.</p> <p>(6.4) Patterns, relationships, and algebraic thinking. The student uses letters as variables in mathematical expressions to describe how one quantity changes when a related quantity changes.</p> <p><i>The student is expected to:</i></p> <p>(A) use tables and symbols to represent and describe proportional and other relationships such as those involving conversions, arithmetic sequences (with a constant rate of change), perimeter and area; and</p> <p>(B) use tables of data to generate formulas representing relationships involving perimeter, area, volume of a rectangular prism, etc.</p> <p>(6.5) Patterns, relationships, and algebraic thinking. The student uses letters to represent an unknown in an equation.</p> <p><i>The student is expected to</i> formulate equations from problem situations described by linear relationships.</p> <p>(6.6) Geometry and spatial reasoning. The student uses geometric</p>	<p>Lessons 24, 26</p> <p>Lesson 77</p> <p>Lesson 15</p> <p>Lesson 16</p> <p>Lesson 5</p> <p>Lesson 80</p> <p>Lesson 105, Inv 11</p> <p>Lesson 88</p> <p>Lessons 80, 81, 10, 8, 31</p> <p>Lessons 10, 8, 31, Inv 6</p> <p>Lesson 119</p>	<p>world. (Romans 5:12)</p> <p>d. All human beings have a choice and all have chosen sin that brings separation from God. (Romans 3:23)</p> <p>e. Sin is rebellion against God's wishes and ways and this destroys our relationship with God. (Romans 8:7-8)</p> <p>f. God provides a way back to Himself through the death of His son Jesus (the second person of the Trinity), on the cross. (John 3:16, Romans 6:23)</p> <p>g. Human beings must respond to God with repentance of our sins, receiving forgiveness, and accepting Jesus as our Savior. (Romans 10:9-10)</p> <p>4. What happens to a person at death?</p> <p>a. For each person death is either the gate to life with God and His people or the gate to eternal separation from God. (1 Corinthians 50:52)</p> <p>b. After death, your soul will continue to exist in an eternal way and there is a final judgment by God. (Revelation 20:12)</p> <p>c. Everyone chooses to honor and love Him by accepting Jesus as our Lord and Savior or makes a choice to reject Jesus and grasp for self-fulfillment and personal glory. (Romans 6:23)</p> <p>d. Those who received Jesus as Savior will spend eternity in Heaven with God.</p>
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<p>vocabulary to describe angles, polygons, and circles. <i>The student is expected to:</i></p> <p>(A) use angle measurements to classify angles as acute, obtuse, or right;</p> <p>(B) identify relationships involving angles in triangles and quadrilaterals; and</p> <p>(C) describe the relationship between radius, diameter, and circumference of a circle.</p> <p>(6.7) Geometry and spatial reasoning. The student uses coordinate geometry to identify location in two dimensions. <i>The student is expected to</i> locate and name points on a coordinate plane using ordered pairs of non-negative rational numbers.</p> <p>(6.8) Measurement. The student solves application problems involving estimation and measurement of length, area, time, temperature, volume, weight, and angles. <i>The student is expected to:</i></p> <p>(A) estimate measurements (including circumference) and evaluate reasonableness of results;</p> <p>(B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight;</p> <p>(C) measure angles; and</p> <p>(D) convert measures within the same measurement system (customary and metric) based on relationships between</p> <p>(6.9) Probability and statistics. The student uses experimental and theoretical probability to make predictions. <i>The student is expected to:</i></p> <p>(A) construct sample spaces using lists and tree diagrams; and</p> <p>(B) find the probabilities of a simple event and its complement and describe the relationship between the two.</p> <p>(6.10) Probability and statistics. The student uses statistical representations to analyze data. <i>The student is expected to:</i></p> <p>(A) select and use an appropriate representation for presenting and displaying different graphical representations of the same data including line plot, line graph, bar graph, and</p>	<p>Lesson 28</p> <p>Lessons 93, 64</p> <p>Lesson 27</p> <p>Inv 7</p> <p>Lessons 16, 68</p> <p>Lessons 7, 32, 10, Inv 6, 86</p> <p>Inv 3</p> <p>Lessons 7, 68, 102, 114</p> <p>Inv 4, Inv 10</p> <p>Lesson 58</p> <p>Inv 5, Lesson 18, Inv 1</p>	<p>(Philippians 4:10-21)</p> <p>e. Those who rejected Jesus as Savior will spend eternity in Hell without God. (Hebrews 10:26-27)</p> <p>5. <i>Why is it possible to know anything at all?</i></p> <p>a. Human beings can both know the world around them and God Himself because God has built within them the capacity to do so and because He takes an active role in communicating with them. (John 16:13)</p> <p>b. God’s own intelligence is the basis of human intelligence. Knowledge is possible because there is something to be known (God and His creation) and someone to know (God and human beings made in His image). (Genesis 1:27)</p> <p>c. God reveals, Himself to us in two basic ways: by general revelation and by special revelation. (Exodus 3:2, Psalm 19:1-4)</p> <p>d. In general revelation, God speaks through the creation of the universe and through His word, the Bible. (2 Samuel 22:31, Psalm 19:1)</p> <ul style="list-style-type: none"> ➤ The Bible is internally consistent and unified in its principles and claims. ➤ There is tremendous coherence across the many authors and centuries during
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<p>stem and leaf plot;</p> <p>(B) identify mean (using concrete objects and pictorial models), median, mode, and range of a set of data;</p> <p>(C) sketch circle graphs to display data; and</p> <p>(D) solve problems by collecting, organizing, displaying, and interpreting data.</p> <p>(6.11) Underlying processes and mathematical tools. The student applies Grade 6 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.</p> <p><i>The student is expected to:</i></p> <p>(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;</p> <p>(B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;</p> <p>(C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and</p> <p>(D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.</p> <p>(6.12) Underlying processes and mathematical tools. The student communicates about Grade 6 mathematics through informal and mathematical language, representations, and models.</p> <p><i>The student is expected to:</i></p> <p>(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and</p> <p>(B) evaluate the effectiveness of different representations to communicate ideas.</p> <p>(6.13) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify</p>	<p>Lesson 18, Inv 5</p> <p>Inv 5</p> <p>Inv 5</p> <p>Lesson 1 to end of book</p> <p>Lesson 1 to end of book</p> <p>Lesson 1 to end of book</p> <p>Lesson 1 to end of book</p> <p>Lesson 1 to end of book</p> <p>Lesson 1 to end of book</p> <p>Lesson 1 to end of book</p>	<p>which the various books were written and in which its stories unfold.</p> <p>➤ It is relevant to all the cultures of the world</p> <p>e. Special revelation is God revealing Himself through supernatural ways. Jesus Christ is the ultimate special revelation. He showed us what God is like more fully than any other form of revelation can. Because Jesus was also completely human, he spoke more clearly to us than any other form of revelation can. (John 14:7)</p> <p>6. <i>How do we know what is right and wrong?</i></p> <p>a. Ethics or the knowledge of right and wrong is based on the character of God as good (holy and loving). (Psalm 33:4)</p> <p>b. There is an absolute standard by which all moral judgments are measured and God Himself – His character of goodness (holiness and love) – is the standard. (1 Samuel 2:3)</p> <p>c. As a result of sin, morally, we have become less able to discern good and evil and less able to know God as He truly is. (Proverbs 1:7)</p> <p>d. God has revealed His standard in the various laws and principles expressed in the Bible. (Psalm 111:10)</p>
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<p>conclusions. <i>The student is expected to:</i> (A) make conjectures from patterns or sets of examples and nonexamples; and (B) validate his/her conclusions using mathematical properties and relationships.</p>	<p>Lesson 58 Lesson 60</p> <p>Student Activities Role Play Games/Puzzles Stories Songs Projects Cooperative Learning Journaling Graphic Organizers Small Groups Drawing Manipulatives Writer’s Workshop Portfolio</p> <p>Teaching Strategies Direct Instruction Open-ended Questions Discussion Demonstration Brainstorming Problem Solving Read Aloud Facilitating Cooperative Learning</p> <p>Evaluation Procedures Observation Class Participation Quizzes/Tests</p>	<ul style="list-style-type: none"> ➤ He has dictated absolute moral truth to us. ➤ Every truth must conform to Biblical principles. ➤ Every choice must reflect God’s moral truth. ➤ We must promote, defend, and teach these truths to others. <p>7. <i>What is the meaning of human history?</i></p> <ol style="list-style-type: none"> a. History is a meaningful sequence of events leading to the fulfillment of God’s purposes for humanity. (Psalm 22:27-28, Psalm 47:3) b. History is going somewhere, directed toward a known end. (Matthew 25:34) c. History is a form of revelation, not only does God reveal Himself in history, but the very sequence of events is revelation. (Psalm 33:13-14, Psalm 47:9) d. History has meaning because God is behind all events, not only sustaining all things by His powerful word but also in all things working for the good of those who love Him. (Psalm 40:5, Romans 8:28) <p><i>What should our response be to God? What were we made for?</i></p> <p>We were made to Love – Matthew 22:37, Worship – Romans 12:1, Obey – 2 John 6, and Give Glory – Psalm 96:3.</p>
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	Projects Reports Survey (oral/written) Portfolio Other Resources and Bibliography AIMS Activity Books	
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