

# Science, Grade 8

**Time on Task:** 3.5 hours per week

## Course Philosophy

Science reflects the magnificent order and complexity of God’s creation. It presents God as the great Designer, Sustainer, and Lawgiver. Students will continually be called on to see the divine wisdom of creation and its implications for other subjects. The student’s mind will be challenged to understand the universe and refute the man-made idea of evolution. Science is presented to show how man is created in God’s image in order to fulfill the Genesis command to subdue the earth and exercise the privilege to rule over it (Genesis 1:28a)

## Course Description

In Grade 8, the study of science includes planning and conducting field and laboratory investigations using scientific methods, analyzing data, critical-thinking, scientific problem-solving, and using tools such as telescopes to collect and analyze information. Students also use computers and information technology tools to support scientific investigations.

<b>Goals and Objectives</b>	<b>Scope and Sequence</b>	<b>Spiritual Goals</b>
<p><b>Texas Essential Knowledge and Skills (TEKS)</b></p> <p><b>§112.24. Science, Grade 8.</b></p> <p><b>(a) Introduction.</b></p> <p>(1) In Grade 8, the study of science includes planning and conducting field and laboratory investigations using scientific methods, analyzing data, critical-thinking, scientific problem-solving, and using tools such as telescopes to collect and analyze information. Students also use computers and information technology tools to support scientific investigations.</p> <p>(2) As students learn science skills, they identify the roles of both human activities and natural events in altering Earth systems. Students learn that stars and galaxies are part of the universe, identify light years as a way to describe distance, and learn about scientific theories of the origin of the universe. Cycles within Earth systems are studied as students learn about lunar cycles and the rock cycle.</p> <p>(3) Students examine information on the periodic table to recognize that elements are grouped into families. In addition, students demonstrate that exothermic and endothermic chemical</p>	<ul style="list-style-type: none"><li>• Consider the Heavens</li><li>• Man and the Universe</li><li>• Solid Matter in Motion</li><li>• Fluids in Motion</li><li>• Heat Molecules in Motion</li><li>• Birds: Efficiency in Motion</li><li>• Science vs. Evolution</li><li>• Magnets and Magnetism</li><li>• Electrons and Electricity</li></ul>	<p><b>God’s intended purpose for science:</b></p> <ol style="list-style-type: none"><li>1. To learn that God looks at the intent of the heart rather than outward beauty. (I Samuel 16:7)</li><li>2. To learn that God’s glory is evident in all of nature. (Psalm 19:1)</li><li>3. To learn that God created the world. (Genesis 1:16)</li><li>4. To learn that all wisdom is found in God. (Proverbs 3:19)</li><li>5. To understand that our knowledge of the origin of life comes from God alone. God tells us that we can know of origins only by believing what He says. (Hebrews 11:3)</li><li>6. To know that no person was present or had any knowledge of His work at the beginning. (Job 38:4, 21)</li><li>7. To understand that all living things have their origin in God. (Genesis 1:11-13, 20-27, 31)</li></ol>

<p>reactions indicate that energy is lost or gained during a chemical reaction. Interactions in matter and energy are explored in solar, weather, and ocean systems. Students identify the origin of waves and investigate their ability to travel through different media.</p> <p>(4) Students predict possible outcomes that result from different genetic combinations and explore the extinction of some species.</p> <p>(5) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.</p> <p>(6) A system is a collection of cycles, structures, and processes that interact. Students should understand a whole in terms of its components and how these components relate to each other and to the whole. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems and can be observed and measured as patterns. These patterns help to predict what will happen next and can change over time.</p> <p>(7) Investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.</p> <p><b>(b) Knowledge and skills.</b></p> <p><b>(1) Scientific processes.</b> The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices.</p> <p><i>The student is expected to:</i></p> <p>(A) demonstrate safe practices during field and laboratory investigations; and</p> <p>(B) make wise choices in the use and conservation of</p>	<p style="text-align: center;"><b>Correlation with TEKS</b>  <b><u>Matter and Motion in</u></b>  <b><u>God's Universe</u></b></p> <p>A Beka Book  Student Code No. 25836  Teacher Code No. 26123</p> <p>All Chapters</p> <p>All Chapters</p>	<p>8. To understand that God cares about all living things. (Matthew 6:26, 28-30)</p> <p>9. To understand that God controls the ecological system. He can make things grow or not grow, be sturdy or diseased. (Psalm 65:9-13)</p> <p>10. To understand that God is the beginning of life on earth. Organisms were first created as mature, complete, and perfect. (Genesis 1:27, 28; 2:19, 20, 23, 24)</p> <p>11. To know that plants, animals, and man were each created with specific purposes. (Psalm 104:14, 15)</p> <p><b>Biblical Integration Truth Statements</b></p> <p><b>1. <i>What is prime reality, the really real?</i></b></p> <p>God exists and is the ultimate reality. (Psalm 90:2, Revelation 22:13)</p> <p>a. God designed, created, and sustains His creation. (Genesis 1:1-31)</p> <p>b. God is good, holy, and loving. (Luke 18:19, 1 John 4:16, 1 Peter 1:16, Psalm 145:12)</p> <p>c. God is omniscient – all knowing. (Romans 11:33-36, Psalm 147:5)</p> <p>d. God is sovereign – nothing is beyond His ultimate interest, control, and authority. (Daniel 4:25)</p> <p>e. God is personal and also triune- He is coequally and coeternally God the Father, God the Son,</p>
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<p>resources and the disposal or recycling of materials.</p> <p><b>(2) Scientific processes.</b> The student uses scientific inquiry methods during field and laboratory investigations. <i>The student is expected to:</i></p> <p>(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;</p> <p>(B) collect data by observing and measuring;</p> <p>(C) organize, analyze, evaluate, make inferences, and predict trends from direct and indirect evidence;</p> <p>(D) communicate valid conclusions; and</p> <p>(E) construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.</p> <p><b>(3) Scientific processes.</b> The student uses critical thinking and scientific problem solving to make informed decisions. <i>The student is expected to:</i></p> <p>(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;</p> <p>(B) draw inferences based on data related to promotional materials for products and services;</p> <p>(C) represent the natural world using models and identify their limitations;</p> <p>(D) evaluate the impact of research on scientific thought, society, and the environment; and</p> <p>(E) connect Grade 8 science concepts with the history of science and contributions of scientists.</p> <p><b>(4) Scientific processes.</b> The student knows how to use a variety of tools and methods to conduct science inquiry. <i>The student is expected to:</i></p> <p>(A) collect, record, and analyze information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, water test kits, and timing devices; and</p>	<p>Chapters 3, 4, 7, 11, 14</p> <p>Chapters 1, 3, 4, 7, 11, 14 Chapters 3, 4, 7, 11, 14</p> <p>Chapters 3, 4, 7, 11, 14 Chapters 2, 3, 4, 7, 8, 11, 14</p> <p>Chapters 8, 10, 11</p> <p>Chapters 10, 11</p> <p>Chapters 3, 4</p> <p>Chapters 10, 11</p> <p>Chapters 8, 10, 11</p> <p>Chapters 1, 3, 4, 7, 11, 14</p>	<p>Jesus, and God the Holy Spirit. (Hebrews 1:3)</p> <p><b>2. What is the nature of external reality, that is, the world around us?</b></p> <p>a. God is the source of everything and created the universe out of nothing. (Genesis 1:1)</p> <p>b. The universe was created by God to be orderly. (Isaiah 45:18, Psalm 147:4)</p> <p>c. God is constantly involved in the unfolding pattern of the ongoing operation of the universe. (Psalm 24:1-2, Psalm 32:13-15)</p> <p>d. The universe reflects His glory. (Psalm 8:1, Psalm 19:1)</p> <p><b>3. What is a human being?</b></p> <p>a. God created humans to know Him intimately and to have a loving relationship with Him. (Psalm 100:3)</p> <p>b. Human beings are created in the image of God with the capacity to choose. (Genesis 1:27, Proverbs 8:10)</p> <p>c. Adam and Eve chose disobedience and brought death to themselves and sin entered the 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>
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<p>field equipment, computers, computer probes, water test kits, and timing devices; and</p> <p>(B) extrapolate from collected information to make predictions.</p> <p><b>(5) Scientific processes.</b> The student knows that relationships exist between science and technology. <i>The student is expected to:</i></p> <p>(A) identify a design problem and propose a solution;</p> <p>(B) design and test a model to solve the problem; and</p> <p>(C) evaluate the model and make recommendations for improving the model.</p> <p><b>(6) Science concepts.</b> The student knows that interdependence occurs among living systems. <i>The student is expected to:</i></p> <p>(A) describe interactions among systems in the human organism;</p> <p>(B) identify feedback mechanisms that maintain equilibrium of systems such as body temperature, turgor pressure, and chemical reactions; and</p> <p>(C) describe interactions within ecosystems.</p> <p><b>(7) Science concepts.</b> The student knows that there is a relationship between force and motion. <i>The student is expected to:</i></p> <p>(A) demonstrate how unbalanced forces cause changes in the speed or direction of an object's motion; and</p> <p>(B) recognize that waves are generated and can travel through different media.</p> <p><b>(8) Science concepts.</b> The student knows that matter is composed of atoms. <i>The student is expected to:</i></p> <p>(A) describe the structure and parts of an atom; and</p> <p>(B) identify the properties of an atom including mass and electrical charge.</p> <p><b>(9) Science concepts.</b> The student knows that substances have chemical and physical properties. <i>The student is expected to:</i></p> <p>(A) demonstrate that substances may react chemically to form new substances;</p>	<p>Chapters 3, 4, 7, 11, 14</p> <p>Chapter 7 Chapter 7 Chapter 7</p> <p>Chapter 7 Chapter 7</p> <p>Chapter 4</p> <p>Chapters 12, 13 Chapter 12, 13</p> <p>Chapters 5, 6 Chapters 5, 6</p> <p>Chapters 5, 6</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><b>4. What happens to a person at death?</b></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. (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><b>5. Why is it possible to know anything at all?</b></p> <p>a. Human beings can both know the world around them and God</p>
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<p>(B) interpret information on the periodic table to understand that physical properties are used to group elements;</p> <p>(C) recognize the importance of formulas and equations to express what happens in a chemical reaction; and</p> <p>(D) identify that physical and chemical properties influence the development and application of everyday materials such as cooking surfaces, insulation, adhesives, and plastics.</p> <p><b>(10) Science concepts.</b> The student knows that complex interactions occur between matter and energy. <i>The student is expected to:</i></p> <p>(A) illustrate interactions between matter and energy including specific heat;</p> <p>(B) describe interactions among solar, weather, and ocean systems; and</p> <p>(C) identify and demonstrate that loss or gain of heat energy occurs during exothermic and endothermic chemical reactions.</p> <p><b>(11) Science concepts.</b> The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. <i>The student is expected to:</i></p> <p>(A) identify that change in environmental conditions can affect the survival of individuals and of species;</p> <p>(B) distinguish between inherited traits and other characteristics that result from interactions with the environment; and</p> <p>(C) make predictions about possible outcomes of various genetic combinations of inherited characteristics.</p> <p><b>(12) Science concepts.</b> The student knows that cycles exist in Earth systems. <i>The student is expected to:</i></p> <p>(A) analyze and predict the sequence of events in the lunar and rock cycles;</p> <p>(B) relate the role of oceans to climatic changes; and</p> <p>(C) predict the results of modifying the Earth's nitrogen, water, and carbon cycles.</p> <p><b>(13) Science concepts.</b> The student knows characteristics of the</p>	<p>Chapters 5, 6</p> <p>Chapters 5, 6, 7</p> <p>Chapters 5, 6, 7</p> <p>Chapters 6, 12</p> <p>Chapters 2, 3, 4, 8</p> <p>Chapters 6, 9, 12</p> <p>Chapter 7</p> <p>Chapter 7</p> <p>Chapter 7</p> <p>Chapters 3, 4, 8, 9, 10</p> <p>Chapters 2, 4, 9, 10</p> <p>Chapters 2, 4, 8, 9, 10</p>	<p>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"> <li>➤ The Bible is internally consistent and unified in its principles and claims.</li> <li>➤ There is tremendous coherence across the many authors and centuries during which the various books were written and in which its stories unfold.</li> <li>➤ It is relevant to all the cultures of the world</li> </ul> <p>e. Special revelation is God revealing Himself through supernatural ways. Jesus Christ is the ultimate</p>
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<p>universe.  <i>The student is expected to:</i>  (A) describe characteristics of the universe such as stars and galaxies;  (B) explain the use of light years to describe distances in the universe; and  (C) research and describe historical scientific theories of the origin of the universe.</p> <p><b>(14) Science concepts.</b> The student knows that natural events and human activities can alter Earth systems.  <i>The student is expected to:</i>  (A) predict land features resulting from gradual changes such as mountain building, beach erosion, land subsidence, and continental drift;  (B) analyze how natural or human events may have contributed to the extinction of some species; and  (C) describe how human activities have modified soil, water, and air quality.</p>	<p>Chapter 14  Chapter 14  Chapters 1, 10, 11, 14    Chapters 3, 4, 8, 9, 10  Chapters 3, 8, 9, 10  Chapters 3, 4, 8, 9, 10</p> <p><b>Student Activities</b>  Role Play  Games/Puzzles  Stories  Songs  Projects  Cooperative Learning  Journaling  Graphic Organizers  Small Groups  Drawing  Manipulatives  Writer’s Workshop  Portfolio</p> <p><b>Teaching Strategies</b>  Direct Instruction  Open-ended Questions</p>	<p>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. <b><i>How do we know what is right and wrong?</i></b>  a. Ethics or the knowledge of right and wrong is based on the character of God as good (holy and loving). (Psalm 33:4)  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)  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)  d. God has revealed His standard in the various laws and principles expressed in the Bible. (Psalm 111:10)  ➤ 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>
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	<p>Discussion          Demonstration          Brainstorming          Problem Solving          Read Aloud          Facilitating          Cooperative Learning</p> <p><b>Evaluation Procedures</b>          Observation          Class Participation          Quizzes/Tests          Projects          Reports          Survey (oral/written)          Portfolio</p> <p><b>Other Resources and Bibliography</b>          None</p>	<p>7. <b><i>What is the meaning of human history?</i></b></p> <p>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)</p> <p>b. History is going somewhere, directed toward a known end. (Matthew 25:34)</p> <p>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)</p> <p>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> <p><b><i>What should our response be to God?          What were we made for?</i></b></p> <p><b>We were made to</b>  <b>Love</b> – Matthew 22:37,  <b>Worship</b> – Romans 12:1,  <b>Obey</b> – 2 John 6, and  <b>Give Glory</b> – Psalm 96:3.</p>
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