ENGLISH: *Grammar*

Grammar IV builds upon the grammar foundation established in previous years and introduces new concepts to further enhance the students' knowledge of basic grammar.

Added Enrichment

- Review games

Evaluation

- Grammar quizzes (21)
- Tests (8), 9-weeks exam (2)
- Semester exam, final exam

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Grammar

- Mechanics:
  - Abbreviations
  - Using numbers in a sentence
- Capitalization:
  - Proper nouns and words formed from proper nouns:
    - Particular persons, places, things:
      - Political and economic organizations and alliances
    - Words referring to Deity and Holy Scripture
    - Words from proper nouns
    - Common noun or adjective when part of proper name
  - Titles of persons, titles of works
  - First word of every sentence
  - Pronoun *I* and interjection *O*
  - First word of every line of poetry
- Punctuation:
  - End marks:
    - Period for declarative sentences, indirect question, and polite request
    - Question mark for interrogative sentences
    - Exclamation point for exclamatory sentences
  - Commas:
    - Before a coordinating conjunction joining two independent clauses
    - To indicate:
      - Omissions or avoid possible misreading
      - Nonessential elements in a sentence:
        - Appositive and appositive phrase
        - Participial phrase
        - Adjective and adverb clauses
        - Direct address
        - *Well, yes, no,* or *why*
        - Parenthetical expressions
    - To set off introductory phrases or clauses
    - In dates and addresses
    - After salutations and closings of letters
  - Semicolons:
    - Between independent clauses:
      - If not using coordinating conjunction
      - Joined by:
        - Transitional words
        - Coordinating conjunction if clauses already contain commas
    - Between items in a series if the items contain commas
  - Colons:
    - Before a list of items
    - To introduce a formally announced statement or quotation
    - Between:
      - Independent clauses when second clause further explains first one
      - Chapter and verse of Bible reference
      - Hour and minute of time reference
    - After salutation of a business letter
  - Italics:
    - For titles of books, magazines, newspapers, plays, works of art, ships, trains, aircraft, and spacecraft
    - For words, letters, numbers referred to as such
    - For foreign words or phrases
  - Hyphens:
    - To divide a word at the end of line
    - In compound numbers
    - In fractions used as adjectives
    - In prefixes before a proper noun or adjective
    - In compound adjectives before a noun
  - Quotation marks:
    - In a direct quotation
    - To enclose titles of short poems, songs, chapters, articles, and other parts of books or magazines
    - To enclose a quoted passage of more than one paragraph: at the beginning of each paragraph and at the end of the last paragraph
  - Apostrophes:
    - To form:
      - Possessive case of nouns
      - Individual possession within a group
      - Possessive case of indefinite pronouns
    - To show omissions from words
    - With *s* to form plurals of letters, numbers, signs, and words used as words
  - Parentheses:
    - To enlcose:
      - Parenthetical elements
      - Brief confimatory information
  - Ellipses:
    - To indicate:
      - A word, phrase, or whole portion of text omitted from a quotation
      - An unfinished thought, pause, or silence
  - Dashes:
    - After a series of words or phrases giving details about a statement that follows
    - To indicate an abrupt change or break in a sentence
    - To set off parenthetical elements or confidential comments

Grammar cont. p. 183

➤ **RED** *indicates first introduction of content.*

ENGLISH: *Grammar* *cont.*

Grammar *cont.*

- The sentence:
  - Definition of sentence
  - Kinds of sentences classified by purpose: declarative, imperative, interrogative, exclamatory
  - Recognizing subjects and verbs: complete subject, simple subject, complete predicate, simple predicate, and verb phrase
  - Overcoming problems locating subjects and verbs:
    - Finding:
      - Subject in an inverted sentence: interrogative sentence, sentence beginning with *there* or *here*
      - Subject of an imperative sentence
      - Verb phrase that is interrupted by other words
  - Diagramming subjects and verbs
  - Recognizing and diagramming compound subjects and verbs
  - Recognizing complements
  - Correcting fragments and run-on sentences:
  - Sentence structure:
    - Defining dependent and independent clauses
    - Recognizing and diagramming simple, compound, complex, and compound-complex sentences
    - Recognizing noun clauses used as subjects of independent clauses
  - ➤ Clear and effective diction
- Parts of speech:
  - Recognizing eight parts of speech
  - Verbs:
    - Recognizing action (transitive and intransitive), linking, and helping verbs
    - Distinguishing verbs from verbals: participles, gerunds, and infinitives
    - Using:
      - Principal parts of verbs
      - Regular verb endings, irregular verbs
    - Using correct principal parts
    - Verb tenses:
      - Using progressive and emphatic forms
      - When to use the tenses
    - Active and passive voice
    - Mood: indicative, imperative, and subjunctive
    - Avoid incorrect verb forms
    - Use troublesome verbs correctly and avoid verb usage errors
  - Nouns:
    - Recognizing nouns:
      - Compound, common, proper, and collective
      - Concrete and abstract
    - ➤ Substantives
    - Keeping agreement of subject and verb
    - Recognizing and diagramming:
      - Nouns as predicate nominatives, direct objects, indirect objects, objects of prepositions, direct address
      - Nouns as appositives
    - ➤ Recognizing and diagramming objective complements
  - Using and diagramming:
    - Gerund phrases
    - Noun clauses
  - Pronouns:
    - Antecedents
    - Recognizing personal, interrogative, demonstrative, indefinite, compound, relative
    - Keeping agreement of verbs and indefinite pronoun subjects
    - Making pronouns agree with their antecedents in number and in gender
    - Nominative case:
      - For subjects, predicate nominatives
      - For appositives of subjects, appositives of predicate nominatives, appositives to subjects, and appositives to predicate nominatives
    - Objective case:
      - For direct objects, indirect objects, objects of prepositions
      - For appositives of direct objects, indirect objects, objects of prepositions
      - For appositives to direct objects, indirect objects, objects of prepositions
    - Possessive case
    - Using correct case for *who, whom, whoever,* and *whomever* and in incomplete clauses beginning with *than* or *as*
    - Avoid pronoun usage problems: double subject, possessive case before a gerund
  - Adjectives:
    - Recognizing and diagramming adjectives: participles and proper adjectives and infinitives as adjectives
    - Distinguishing adjectives from nouns and pronouns
    - Recognizing and diagramming predicate adjectives
    - Using and diagramming:
      - Prepositional and participial phrases as adjectives
      - Infinitive phrases as adjectives
      - Adjective clauses
    - Using adjectives in comparison
    - Avoiding double comparison and double negatives
  - Adverbs:
    - Recognizing and diagramming adverbs
    - Infinitives as adverbs
    - Distinguishing adverbs from adjectives
    - Using and diagramming:
      - Prepositional phrases as adverbs
      - Infinitive phrases as adverbs
      - Adverb clauses
    - Distinguishing dependent clauses:
      - Advanced technique to determine dependent clauses as noun, adjective, or adverb
    - Using: adverbs in comparison
  - Prepositions:
    - Recognizing prepositions, prepositional phrases, and objects of prepositions
    - Distinguishing between prepositions and adverbs
    - Using prepositions correctly
  - Conjunctions:
    - Recognizing coordinating, correlative, and subordinating conjunctions
  - Interjections:
    - Definition
    - Punctuation with interjections
    - Other parts of speech used as interjections
    - Diagramming interjections
- Word study:
  - ➤ Usage and diction:
    - ➤ Glossary of diction

ENGLISH: *Composition with Vocabulary and Spelling IV*

Focused on advancing students' writing and spelling skills, *Composition with Vocabulary and Spelling IV* features lessons demonstrating the importance of clarity and logic. Annotated project examples guide students through the process of drafting concise and coherent compositions. Throughout twenty units, students also apply spelling rules and etymology while learing vocabulary terms from fields of history, fine arts, science, and business.

Added Enrichment

- Spelling and vocabulary
  - Spelling words (400)
  - Vocabulary words (240)
- Spelling lists (20)
  - Organized by spelling rules, common prefixes or roots, history, fine arts, science, or business themed words, and countries and territories
- Vocabulary lists (20)
  - Organized by words to know, prefixes and roots, and highlights in history, fine arts, science, or business
  - Each vocabulary word includes:
    - Pronunciation
    - Part of speech and definition
    - Sample sentence
    - Synonyms and antonyms
    - Related forms of the word
- Practice exercises (80)
- Vocabulary chart showing:
  - Prefixes (52), suffixes (48)
  - Greek and Latin roots and meanings (108)
- Guidelines for solving analogy questions
- Pronunciation key

Evaluation

- Compositions:
  - Compare-contrast essay
  - Process essay
  - Critical book review (2)
  - Description paragraph
  - Personal narrative
  - Research paper and author project
  - Formal oral presentation
  - Online review
  - Literary essay
- Optional (graded at teacher's discretion):
  - Cultivating Creativity (12)
  - Freewriting (9)
- Spelling and vocabulary quizzes:
  - 20 list quizzes
  - Quarterly review (1 each 9 weeks; each counts as 2 quiz grades)

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Composition

- The Writing Process
  - The thesis
  - Improving Writing Style: parallelism
  - The outline
    - Preparing and writing topical and sentence outlines
- The Paragraph
  - Planning and writing the paragraph
  - Rewriting the paragraph with Improving Writing Style: unity, coherence, subordination, stringy style, choppy style, monotonous style, conciseness
  - Editing the paragraph
- Expository writing
  - The Compare-Contrast Essay
    - Planning (Reading with Purpose charts), writing, rewriting, and editing the compare-contrast essay
  - Improving Writing Style: point of view
  - The Process Essay
    - Planning, writing, rewriting, and editing the process essay
- The Critical Book Review
  - Reading and evaluating a work
  - Planning (Reading with Purpose charts) and writing the critical book review
  - Citing sources
    - Using quotations, paraphrases, and summaries
  - Rewriting and editing the critical book review
- Narrative Writing
  - The Description Paragraph
    - Planning, writing, rewriting, and editing the description paragraph
  - Improving Writing Style: correct tense sequence, active voice, and using a consistent subject
  - The Personal Narrative
    - Planning the personal narrative
      - Developing plot structure
      - Creating believable dialogue
      - Implementing dialogue tags
      - Incorporating voice
    - Writing, rewriting, and editing the personal narrative
- The Author Project
  - The Critical Book Review
    - Reading and evaluating a work
    - Planning (Reading with Purpose charts), writing, rewriting, and editing the critical book review
  - The Author Research Paper
    - Planning the research paper (Reading with Purpose charts)
      - Creating a working bibliography
      - Organizing a preliminary outline
      - Taking notes over outside sources
      - Finalizing the outline for the composition
    - Writing, rewriting, and editing the research paper
    - Finalizing the research paper
      - Title page
      - Pledge page
      - Finalized bibliography page
- Applied Writing
  - Formal Oral Presentation
    - Planning the oral presentation
    - Planning the visual
    - Delivering the presentation
  - Improving Writing Style: gobbledygook, jargon, triteness, levels of usage, exact and vivid words, placing and punctuating modifiers
  - ➤ The Online Review
    - ➤ Planning and writing the online review

Composition with Vocabulary and Spelling cont. p. 185

➤ **RED** *indicates first introduction of content.*

ENGLISH: *Composition with Vocabulary and Spelling IV* *cont.*

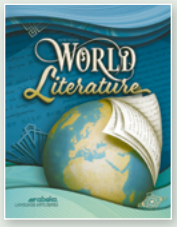
Composition *cont.*

- The Literary Essay
  - Planning (Reading with Purpose charts), writing, rewriting, and editing the literary essay
- ➤ Cultivating Creativity
  - ➤ Writing prompts and freewriting exercises throughout each unit of the book
- Resource Material
  - The Library
  - The Dictionary
  - Documentation
    - Footnotes, endnotes, and parenthetical citations

Spelling & Vocabulary Skills Development

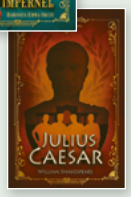
- Master spelling lists including:
  - Vocabulary words and definitions
  - Words that follow spelling rules
  - Prefixes and roots
  - ➤ Themed words in the topics of history, fine arts, science, and business terms
  - ➤ Countries and territories
  - Words to know
- Use vocabulary words in proper context
- Memorize vocabulary definitions
- Be able to identify commonly misspelled words
- Apply spelling and phonics concepts through daily teacher-directed oral practice and independent written practice
- Develop ability to solve analogy questions
- Master 60 roots and 40 prefixes
- Learn more than 1,000 synonyms, antonyms, and related forms for vocabulary words
- Analyze word meanings based on their prefixes, roots, and suffixes
- Learn spelling rules
  - *i* before *e* except after *c* or when sounded like *a* as in *neighbor* and *weigh*
  - Double the final consonant before a suffix beginning with a vowel if the word has only one syllable or is accented on the last syllable and if the word ends in a single consonant preceded by a single vowel.
  - Do *not* double the final consonant before a suffix if the last syllable is not accented.
  - Do *not* double the final consonant before a suffix if the word does not end in a single consonant preceded by a single vowel.
  - For words ending in *y* preceded by a consonant, change the *y* to *i* before all suffixes except those beginning with *i*.
  - In adding a suffix to a word ending in silent *e*, retain the *e* if the suffix begins with a consonant, but drop the *e* if the suffix begins with a vowel.
  - Drop the final *e* when *-ment* is added to words ending in *dge*.
  - Retain the final *e* in words ending in *ce* or *ge* when *-able* or *-ous* is added.
  - When two words are compounded (put together as one), the spelling of the two parts does not change.
  - When a prefix is added to a word, the spelling of the word itself does not change.
  - Spell by syllables and say the word aloud or in your mind as the word will be written, not as it may be pronounced.
  - Learn to distinguish between homophones.
  - Learn lists of commonly misspelled words.

ENGLISH: *Literature*



In previous years, students read mostly for enjoyment, but now they will learn about analysis of literature by studying a variety of literary and rhetorical terms and devices. Students will read classics from the literary canon which reflect the historical and cultural viewpoints of authors from around the world analyzed through a biblical worldview.

Art appreciation is also an important part of the literature study in English 10. As the author uses words to paint visual images in our minds, the artist uses his brush to paint a story. *World Literature* includes great works of art that reflect each unit.



Literary Value

- 113 works from around the world
- Prose selections (45), poems (59), essays (8), dramas (5), and novel (1)

Added Enrichment

- Footnotes define and explain unfamiliar words
- Pronounciation guides for foreign words
- Comprehension and discussion questions after selections
- Introductory paragraphs for literary, historical, and cultural information
- Review games
- Author biographies
- Literary terms, themes, and significant structures identified throughout
- Reading strategies at the beginning of each selection

Evaluation

- Comprehension quizzes (16)
- Homework reading quizzes (41)
- Optional reading quizzes (78)
- Tests (8), 9-weeks exam (2)
- Semester exam, final exam

➤ **RED** *indicates first introduction of content.*

Reading Analysis Skills Development

- Develop skills in analysis and comprehension
- Be able to identify significant quotations and the selections in which they are featured
- Increase vocabulary
- ➤ Further develop writing skills
- ➤ Learn various literary genres, including short story, essay, novel, and lyric, narrative, and dramatic poetry
- ➤ Learn meaning and use of literary terms and devices such as theme, plot, imagery, figurative language, point of view, dramatic structure and denouement
- ➤ Learn meaning and use of rhetoric (*logos*, *pathos*, and *ethos*) and rhetorical devices such as rhetorical questions, anaphora, and antithesis
- ➤ Study the development of plot, theme, setting, and character

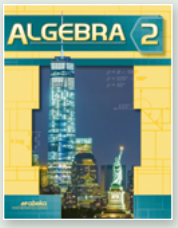
Comprehension, Discussion & Analysis Skills Development

- Read entire works: *The Scarlet Pimpernel* and *Julius Caesar*
- Study drama and learn about Elizabethan and Greek theaters
- Develop proper discernment according to the truths of Scripture
- Answer factual, interpretive, and inferential comprehension and discussion questions
- Improve ability to use deductive reasoning, understand cause and effect, and draw conclusions
- Build appreciation for good literature and a love of reading
- ➤ Learn to analyze literature while studying selections
- ➤ Comprehend and appreciate the basic elements of a work of literature
- ➤ Learn to appreciate the rhyme, rhythm, and figurative language of poetry

Poetry Skills Development

- ➤ Memorize 10 lyrical poems
- Develop appreciation of poetry
- Lay foundation for future literature study
- Perform in front of an audience
- Recite in unison
- Use appropriate expression and volume
- Increase vocabulary
- Demonstrate comprehension of emotion and content
- Develop a mental visualization of the poem
- Discuss meaning and purpose of poems
- Use proper observation of punctuation

MATHEMATICS: *Algebra 2*



Algebra 2, building from a foundation of basic algebra, develops confidence in problem-solving strategies through application of in-depth algebraic skills. Students will gain thorough exposure to algebraic techniques applied in many branches of mathematics. Concepts such as matrices, linear programming, and hypothesis testing will pique student interest in mathematical application. An increased understanding of algebraic concepts will result in thorough preparation for further study in mathematics.

Algebra 2 builds from mathematical ideas to practical problem solving with applications in business, science, sports, medicine, and statistics. Students will learn to analyze results and make informed decisions for everyday life.

For this grade level, see also *Plane Geometry* on p. 205.
Also available: *Consumer Mathematics* and *Business Mathematics* on Electives pp. 237–241.

Features:

- Flexible pacing options in curriculum
- Review exercises for every section (83)
- Mid-chapter reviews (12)
- Chapter reviews (12)
- Word problem review
- Quarter reviews (2)
- Semester Review
- Final Review

Evaluation:

- Quizzes (42)
- Tests (8)
- Quarter Exams (2)
- Semester Exam
- Final Exam

➤ **RED** *indicates first introduction of content.*

Basic Algebra

- Order of operations
- Algebraic properties
- Exponent properties
- Negative exponents
- Words as Algebraic Expressions
- Addition and Subtraction of Polynomials
- Multiplication and Division of Polynomials
- Special Cases of Multiplication
- Factoring Special forms
- Sum and Difference of Odd and Even Powers
- Factoring by Grouping

Equations and Inequalities

- Equations in one variable
  - Absolute value
  - Literal
  - Quadratic
    - Zero Factor property
    - Extracting the root
    - Completing the square
    - Quadratic formula
    - Discriminant
  - Rational
    - Cross-multiplication
    - LCD
  - Radical
- Inequalities
  - ➤ Interval Notation
  - Linear
  - Compound
  - Absolute Value
- ➤ Complex numbers
  - ➤ Imaginary unit
  - ➤ Powers of i
  - ➤ Standard form
  - ➤ Arithmetic
  - ➤ Quadratic with complex solutions

Polynomial Equations and Inequalities

- ➤ Rational Zero Theorem
- ➤ Factor Theorem
- ➤ Remainder Theorem
- ➤ Synthetic Division
- ➤ Solving a polynomial equation
- ➤ Equations of the quadratic form
  - ➤ Integer exponents
  - ➤ Rational exponents
- ➤ Nonlinear absolute value equations
- ➤ Polynomial Inequalities
  - ➤ Critical number
  - ➤ Rational inequalities

Functions and The Cartesian Plane

- Two-variable linear equation
- Distance formula
- ➤ Midpoint formula
- Slope formula
- Intercepts
- Graphing with slope and point
- Standard form
- Slope-intercept form
- Point-slope form
- Parallel and Perpendicular lines
- Direct variation
- Inverse variation
- Functions
  - Vertical line test
  - ➤ Algebraic test
  - Notation
  - Evaluation
  - Domain
  - Range
  - Types of functions
    - Quadratic
    - Constant
    - Absolute value

Algebra 2 cont. p. 188

➤ **RED** *indicates first introduction of content.*

MATHEMATICS: *Algebra 2* *cont.*

Functions and The Cartesian Plane *cont.*

- Types of functions cont.
  - Radical
  - Rational
- Combination of Functions
- Composition of Functions
- Translational Graphing
  - Parent function
  - Standard graphing form
  - Rigid and Nonrigid Transformations
- Parabola Vertex Formula

System of Equations and Inequalities

- Intersecting, parallel, and coincident lines
- Substitution method, Elimination method
- Parameter
- Three-variable linear systems
- Elementary row-operations
- Two-variable inequalities
- System of two-variable inequalities
  - Intersection
  - Unbounded, bounded
  - Boundary line
- Linear programming
  - Objective function
  - Constraints
  - Feasible solution

Matrices

- Definition
- Parts and types of matrices
- Arithmetic with matrices
- Matrix multiplication
- Identity matrix
- Inverse matrix
- Elementary row operations
- Gaussian elimination
  - Augmented matrix
  - Triangular form
- Gauss-Jordan elimination
  - Diagonal form
- Determinants
- Diagonal
- Antidiagonal
- Cramer's rule
- Matrix inversion
- Solving by matrix inversion
- Adjugate matrix

Exponential and Logarithmic Functions

- Finding inverse of a function
- One-to-one function
- Horizontal line test
- Evaluating exponential functions
- Translational graphing of exponential functions
- Logarithmic functions
  - Common logarithmic function
  - Natural logarithmic function
- Converting between exponential and logarithmic form
- Properties of logarithms
  - Expanding logarithmic expressions
  - Condensing logarithmic expressions
- Change of base formula
- Solving exponential and logarithmic equations
  - Inverse properties, exponentiation, taking logarithm of both sides
- Application of logarithms
  - Bacteria growth, Interest formula, Newton's law of cooling, Sound level

Trigonometry

- Angle properties
- Classification of angles
- Sum of angles
- Right triangle properties
- Right triangle setup
- Similar polygons
- Trigonometric functions
- Trigonometric reciprocal functions
- Using calculator
  - Inverse
  - Reciprocal
- Radian
- Special triangle
  - 30°-60°-90° triangle
  - 45°-45°-90° triangle
- Angles on the Cartesian plane
  - Reference angle
  - Reference triangle
  - Coterminal angles
  - ASTC
- Trigonometric Equations
- Unit Circle

Sequences, Series, and Counting

- Arithmetic Sequences
- Series
  - Summation notation
  - Series formulas: constant, consecutive integers, consecutive squares
- Mathematical induction
- Geometric Sequences
  - Converging, Diverging
- Finite Geometric Series
- Infinite Geometric Series
- Counting
- Permutation
- Combination
- Binomial Theorem

Probability

- Relative frequency
- Mutually and non-mutually exclusive events
- Probability of multiple events
  - Independent and dependent events
- Frequency distribution
- Relative frequency distribution
- Probability density function
- Uniform probability distribution
- Geometric probability

Algebra 2 cont. p. 189

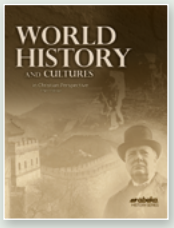
➤ **RED** *indicates first introduction of content.*

MATHEMATICS: *Algebra 2* *cont.*

Statistics

- Descriptive and inferential statistics
- Measures of center
  - Mean, median, mode
- Measure of dispersion
  - Range
  - ➤ Mean deviation
  - Standard deviation
  - ➤ Variance
- Normal distribution
- ➤ Standard normal distribution
- ➤ Calculating z-score
- ➤ Sampling Distribution
- ➤ Central Limit Theorem
- ➤ Hypothesis Testing

HISTORY & GEOGRAPHY: *World History*



World History and Cultures is written and taught from the Christian perspective. Basic to this perspective is the conviction that God is the Creator of the universe and the Controller of history. Because the focal point of history is the birth of Christ, *World History and Cultures* takes the view that all history is either pointing toward the birth of Christ or looking back to it. Students study how God used events before the birth of Christ to prepare the world for His coming. Then, after His birth, they trace the impact of Christianity on the events of world history.

The Christian perspective of *World History and Cultures* helps students see the sovereign hand of God in history, as well as the consequences of man's choices. The Providence of God has guided history for His glory. Yet each person is free to choose whether to obey God and be used by Him, or to disobey and suffer the consequences. Thus world history also illustrates the truth of Proverbs 14:34: "*Righteousness exalteth a nation: but sin is a reproach to any people.*"

Added Enrichment

- Special feature boxes (56):
  - Provide a framework for understanding the concepts in history
  - Explore language and writing through the ages
  - Give insight to the people and events of history
- Maps correlating to text (84)

Evaluation

- Reading quizzes (30)
- Review quizzes (40)
- Geography map projects (8; each counts as quiz grade)
- Current events (32; each counts as quiz grade)
- Tests (8), 9-weeks exam (2)
- Semester exam, final exam

➤ **RED** *indicates first introduction of content.*

Foundations for Studying History

- Creation versus evolution
- Capital punishment
- Beginning of languages, nations, and races: Nimrod and Babel

Asia and Africa: The Beginning of Civilization

- Cradle of Civilization: Fertile Crescent and Mesopotamia (c. 2300–1800 B.C.):
  - Sumer:
    - Cuneiform, culture, civilization, education, architecture, trade, society, religion
    - ➤ Mathematics, government
  - ➤ Settlements: Eridu, Uruk, Ur
  - ➤ Golden Age of Ur, Epic of Gilgamesh
- Middle East (c. 1800 B.C.–A.D. 700s):
  - Old Babylonian Empire:
    - Hammurabi and the law
    - ➤ Place-value notation, Babylonian Genesis
  - Hittite Empire
  - Assyrian Empire: Tiglath-pileser I, Nineveh
  - New Babylonian Empire: Nebuchadnezzar and Daniel
  - Persian Empire: Cyrus the Great, Darius I, and Xerxes I
  - Israel: Patriarchs, Exodus, Moses, Decalogue, theocracy, David, and Divided Kingdom
  - ➤ Hebrew and Arabic language
  - Rise of Islam: Byzantine Empire, Constantinople, and Mohammed
  - Missionary efforts:
    - ➤ Ion-Keith Falconer and Samuel Zwemer
- Other Asian cultures (c. 2000 B.C.–A.D. 1800s):
  - India: Indus River, Hinduism, caste system, and Buddhism
  - Ancient Chinese dynasties
  - ➤ Chinese language
  - Japan: Shinto religion
- Egypt—Gift of the Nile (c. 2300 B.C.–A.D. 1700s):
  - History and language: Herodotus and the Rosetta Stone
  - ➤ Religion: *Book of the Dead*
  - ➤ Thebes
  - Old, Middle, and New Kingdom
- Other African cultures (c. 2300 B.C.–A.D. 1700s):
  - ➤ Land of Phut and Cush
  - Ethiopia:
    - Kingdom of Aksum and Ethiopian Orthodox Church:
      - ➤ Piankhi, Ebed-melech
  - Early Christianity in North Africa: Simon of Cyrene, Tertullian, Clement of Alexandria, Athanasius, and Augustine
  - Other empires and kingdoms:
    - Ghana, Mali, Songhai, and Kongo:
      - ➤ Mansa Musa and King Ewuare

World History cont. p. 190

➤ **RED** *indicates first introduction of content.*

HISTORY & GEOGRAPHY: *World History* *cont.*

Europe: Beginnings of Western Civilization

- Greece (c. 2000–30 B.C.):
  - Minoans and Mycenaeans
  - Civilization: Homer, Greek gods, city-states, Olympics
  - Greco-Persian Wars:
    - ➤ Ionian Revolt, Battle of Plataea
  - Types of government
  - ➤ Draco's Code
  - ➤ Court of Areopagus
  - ➤ Peisistratus and Cleisthenes
  - Sparta and Athens: Peloponnesian War
  - Macedonia:
    - Alexander the Great
    - ➤ Battle of Ipsus
  - Classical Greece:
    - Writing and philosophy
    - ➤ Hellenic Age, education and architecture, art and science
  - Hellenistic Age:
    - ➤ Stoics and Epicureans
  - ➤ Language of the New Testament: Koine Greek
- Rome (c. 753 B.C.–A.D. 476):
  - Early people:
    - Latins, Etruscans, Magna Graecia, Carthage, and Gauls
    - ➤ Italis
  - ➤ Society: family, religion, education, and government
  - Punic Wars:
    - Hannibal and Scipio
    - ➤ Battle of Cannae
  - ➤ Civil Wars: reforms of Gracchi
  - Pax Romana
  - Emperors:
    - Claudian, Flavian, "Five Good Emperors," "Barracks Emperors," Diocletian
      - ➤ Hadrian's wall
    - Christian emperor: Constantine I
  - Fall of Rome:
    - ➤ Romulus Augustulus
  - ➤ Legacy of Rome: language, literature, law
- Early church history (A.D. 30–476):
  - Apostolic church: the New and Old Testaments
  - ➤ Persecuted and imperial church
- Byzantine Empire (c. A.D. 324–1453):
  - ➤ Age of Justinian: Hagia Sophia, Justinian Code, and Theodora
  - ➤ Fall of Byzantium
  - ➤ Byzantine contributions: Eastern Orthodox, Greek liturgy, Byzantine text

The Middle Ages: From the Ancient to the Modern

- Dark Ages (c. A.D. 500–1500):
  - Church of Rome:
    - Petrine Theory, Pope Leo I, Gregory I
    - ➤ Patrick of Ireland
  - Doctrine of Romanism
  - Other teachings: John Wycliffe, Vulgate, Peter Waldo, Council of Toulouse
  - Charlemagne's empire:
    - ➤ Division: Lothar, Charles, Louis
    - Lorraine
    - Saxons
  - ➤ Salians, Hohenstaufens
  - ➤ Investiture Controversy
  - ➤ Decline of the papacy: Babylonian Captivity of the papacy and the Great Schism
- Medieval culture (c. A.D. 500–1500):
  - Feudal society and chivalry
  - Crusades:
    - Check and balance results
    - ➤ Bernard of Clairvaux, Frederick Barbarossa, Philip Augustus
  - ➤ Pre-Reformation Europe
  - Universities and scholasticism:
    - Thomas Aquinas and William of Ockham
    - ➤ Trivium and quadrivium, scholasticism
  - Forerunners of the Reformation:
    - John Wycliffe, Roger Bacon, and John Huss
    - ➤ Gerhard Groote and Savonarola
  - Italian Renaissance:
    - Humanism
    - ➤ Petrarch, Boccaccio, Giotto
  - Johann Gutenberg: Gutenberg Bible
- Rise of modern nations (c. 850–1300):
  - Ancient Britain: Stonehenge, Celts, Angles, Saxons, Jutes, and *Beowulf*
  - Alfred the Great
  - Norman Conquest:
    - ➤ Charter of Liberties and Exchequer
  - Plantagenet kings:
    - ➤ Eleanor of Aquitaine, House of Lords, and House of Commons
  - Hundred Years' War, Wars of the Roses
  - Feudal France:
    - Hugh Capet and Estates-General
    - ➤ House of Valois
  - Spain:
    - Moorish culture, the Reconquista, Spanish Inquisition
    - ➤ El Cid, Antonio de Nebrija
  - Portugal:
    - Prince Henry
    - ➤ Alfonso Henriques
  - ➤ Age of Exploration
  - Native civilizations: Arawaks, Mayas, Incas, and Aztecs
  - France: Northwest Passage

The Reformation Era: The Modern Age Begins

- Protestant Reformation (c. 1517–1600):
  - Renaissance in Germany, England, and France:
    - ➤ Johann Reuchlin, Philipp Melanchthon, John Colet, Thomas Moore
  - Martin Luther:
    - Charles V, Edict of Worms, popular education
    - ➤ Katharina von Bora
  - Switzerland:
    - Ulrich Zwingli, John Calvin, Conrad Grebel, Anabaptists
    - ➤ Guillaume Farel
- Post-Reformation Europe (c. 1517–1650):
  - ➤ Augsburg Confession
  - Counter-Reformation:
    - The Inquisition, Loyola
    - ➤ The Index, Council of Trent

World History cont. p. 191

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HISTORY & GEOGRAPHY: *World History* *cont.*

The Reformation Era: The Modern Age Begins *cont.*

- Reformation in the Netherlands: Council of Blood and William the Silent
- English Reformation:
  - Tudor rulers, Spanish Armada
  - ➤ Act of Supremacy, Lady Jane Grey
- Scottish Reformation: Mary Stuart vs. John Knox
- Reformation in France: Huguenots and St. Bartholomew's Day Massacre
- Thirty Years' War:
  - Peace of Westphalia
  - ➤ Count of Tilly, Albrecht Wallenstein
  - ➤ Battle of Lützen, results of Thirty Years' War
- Post-Reformation science and culture (c. 1517–1800):
  - Founders and progress of modern science
  - Classics: music and art

The Age of Ideas: Revolution, Revival, and Reform

- France—road to revolution (c. 1640–1815):
  - ➤ Age of Absolutism: War of the Spanish Succession
  - Enlightenment:
    - ➤ Diderot
  - ➤ Reasons for the revolution: religious, economic, and social turmoil
  - French Revolution
  - Reign of Terror:
    - Atheism, deism
    - ➤ Directory
  - Tyranny of Napoleon: Continental System, Battles of Leipzig and Waterloo
- England and America: quest for freedom (c. 1600–1800):
  - James I: Puritans, Separatists, KJV, Jamestown, and Plymouth
  - ➤ National Covenant, Long Parliament, Grand Remonstrance
  - English Civil War:
    - Oliver Cromwell
    - ➤ Rump Parliament, Battle of Marston Moor, Battle of Naseby, Treaty of Dover
  - Glorious Revolution
  - Pietism in Germany:
    - Philipp Spener
    - ➤ Count von Zinzendorf
  - Great Awakening in America: Jonathan Edwards and George Whitefield
  - ➤ Age of Reason: John Locke and David Hume
  - Wesleyan Revival: John and Charles Wesley
  - Rise of modern missions:
    - William Carey and Adoniram Judson
    - ➤ John Howard
  - French and Indian War
  - American War for Independence
- Age of Industry (c. 1760–1900):
  - Protestant work ethic
  - Agricultural advancements: better use of land and tools
  - Industrial Revolution: Enclosure Movement and domestic and factory system
  - Transportation and communications:
    - ➤ Guglielmo Marconi
  - ➤ Science: Dalton, Faraday, Kelvin, Maxwell, Curie, Jenner
  - United States' rise to power: capitalism and the Spanish-American War
  - Blessings of capitalism: John D. Rockefeller, Andrew Carnegie, J. P. Morgan, philanthropy, and Adam Smith
- Victorian Era: England's Age of Progress (1837–1901):
  - Great English statesmen: William Pitt the Younger and Sir Robert Peel
  - Victorian England: William Gladstone and Benjamin Disraeli
  - China and Japan missions:
    - ➤ Treaty of Amity and Commerce, Neesima
  - Christianity and charity
  - ➤ British imperialism:
    - Crimean War and British North America Act
  - India: Sepoy Rebellion, William Carey and Amy Carmichael
- Victorian Era: England's Age of Progress (1837–1901) cont.:
  - Africa:
    - David Livingstone, Robert Moffat, and Samuel Adjai Crowther
    - ➤ Khama
  - South Africa:
    - Afrikaners and Boer War
    - ➤ Cecil Rhodes, Paul Kruger, Louis Botha
  - ➤ Beginning of Britain's decline: Charles Darwin, Thomas Henry Huxley, Christian Socialists, Fabian Society, utilitarians, and modernism
- Unbelief and revolution in 19th-century Europe (c. 1800–1900):
  - ➤ German philosophy and liberal Christianity: romanticism, idealism, relativism, dialectic thinking, "Higher Criticism," modernists, and Darwinism
  - Age of Metternich
  - Revolutions of the 1830s: France, Belgium, and Central Europe
  - Revolutions of 1848: Louis Napoleon, Austria, and German states
  - Franco-Prussian War:
    - Otto von Bismarck and Wilhelm II
    - ➤ Third French Republic
  - ➤ Rise of modern socialism

Twentieth Century: A World at War

- World War I (1914–1918):
  - Road to war: spiritual decay
  - Fronts:
    - Eastern, western, Balkans, and Italian
    - ➤ Pétain, von Ludendorff
  - Bolshevik Revolution
  - American involvement:
    - *Lusitania* and the Zimmermann Note
    - ➤ Weimar Republic
  - ➤ Providence of God in History
  - Aftermath of war: Wilson's Fourteen Points, Treaty of Versailles, and League of Nations
- Rise of Communism (1848–1939):
  - Roots of Communism: Karl Marx, dialectical materialism, bourgeoisie, proletariat, Frederich Engels, *Communist Manifesto, Das Kapital*
  - Early Russian history of the czars
  - Bolshevik Revolution: Vladimir Lenin, Leon Trotsky, Red Guards, Cheka
  - Lenin's Russia:
    - Third International, new economic policy, USSR
    - ➤ Central Committee
  - Stalin's Russia: Five-Year Plan, collectivization, genocide
  - ➤ *Why Communism Kills*

World History cont. p. 192

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HISTORY & GEOGRAPHY: *World History* *cont.*

Twentieth Century: A World at War *cont.*

- ➤ Twentieth-century liberalism (c. 1900–1940):
  - ➤ Defining liberalism and conservatism
  - ➤ Liberal pseudo-sciences and philosophies
  - ➤ Liberalism in education versus traditional education
  - ➤ Religious liberalism: modernism, social gospel, and ecumenism
  - ➤ Christian witness
  - ➤ Liberalism and conservatism in the arts
  - Prosperity of the Twenties: Paris Peace Pact
  - Great Depression: easy credit, risky investment, and government involvement
- World War II (1939–1945):
  - Ideologies and dictatorships
  - Aggressors on the march:
    - ➤ Munich Pact, Siegfried and Maginot Lines
  - European Theater:
    - Battle of Britain, Winston Churchill, and Erwin Rommel
    - ➤ Invasion of Scandinavia
  - Invasion of Russia
  - American involvement:
    - Neutrality Act, Lend-Lease Act, Pearl Harbor, and D-Day
    - ➤ Panay Incident
  - European Theater: Operation Torch, Italian Campaign
  - Key battles in the Pacific Theater:
    - Bataan Death March, Doolittle's raid, Midway, Coral Sea, Guam, Saipan, Iwo Jima, Okinawa, and kamikazes
    - ➤ Battle of the Java Sea, Guadalcanal, the Aleutians, the Gilberts, the Marianas
  - Manhattan Project:
    - ➤ Fermi, Teller, Oppenheimer
  - Holocaust
  - ➤ Aftermath: wartime conferences
- Cold War Era (c. 1945–1989):
  - ➤ Forming, framework, and failure of the UN
  - Communist subversion: Rosenbergs, Klaus Fuchs, and Joseph P. McCarthy
  - Response of the West:
    - Truman Doctrine, containment, Marshall Plan, and NATO
    - ➤ Warsaw Pact
  - Fall of Nationalist China: Chiang Kai-shek, George C. Marshall, and Taiwan
  - Communist China:
    - Mao Tse-tung, cultural revolution, Red Guards
    - ➤ Five-Year Plan
  - Korean War:
    - MacArthur vs. containment
    - ➤ Inchon
  - International changes:
    - Communist Cuba
    - ➤ South America: Isabel Perón and Salvador Allende
    - ➤ Asia:
      - ➤ Conflicts in Israel, Lebanon, Iran, and Iraq
      - Conflict in India
    - Africa
  - Vietnam War:
    - ➤ Ngo Dinh Diem
    - ➤ Nuclear freeze movement
  - Space Age
  - Rise of conservatism in the West
  - Margaret Thatcher, Ronald Reagan, Falkland Islands, Reagan Doctrine, SDI:
    - ➤ KAL 007, Chernobyl
  - Changes in Eastern Europe: perestroika, glasnost, Berlin Wall falls, Poland, Hungary
  - Tiananmen Square Massacre
- Rise of globalism (c. 1990s–present):
  - Persian Gulf War
  - Rise of Islamic terrorism: 9/11 attacks and Bush Doctrine
  - ➤ Pakistan and Kashmir
  - Changes in Western Europe:
    - Gordon Brown, Jacques Chirac, Angela Merkel
    - ➤ Maastricht Treaty
  - Eastern Europe: Bosnia, Slobodan Milosevic, Kosovo, Dayton Peace Accords
  - Russia after the Cold War:
    - Boris Yeltsin, Dmitri Medvedev
    - ➤ Chechnya
  - ➤ North Korea: Kim Jong Un
  - New leaders in African nations
  - Cuba and Raul Castro
  - ➤ South America: Daniel Ortega
  - ➤ Canada: Pierre Trudeau, Kim Campbell
  - ➤ United States: GATT
  - Asia and the Pacific:
    - Japan
    - ➤ Taiwan and Lee Teng-hui
    - ➤ South Korea and Kim Young Sam
    - Southeast Asia
  - Israel and the PLO:
    - Road map for peace
    - ➤ Operation Defensive Shield
  - ➤ Intelligent Design
  - Bioethics
  - Environmentalism and globalism

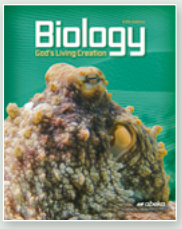
Geography

- Geography projects (8) featuring maps, both physical and political:
  - The World
  - The Middle East
  - Asia
  - Africa
  - Europe
  - North America
  - South America
  - Australia and New Zealand

Prayer Time

- Learn to pray for our nation and for government officials

SCIENCE: *Biology*



Biology: God's Living Creation deals with one of the most fascinating subjects known to man. Students begin with a combination of field, text, and lab work to take a closer look at plants. They will use the microscope and dissections as they study the Creator's provision for plants and animals. A detailed study of the anatomy and physiology of the human body will lead students to understand that they are "fearfully and wonderfully made."

Students will look deeper into the micro-cosmos as they learn some of man's latest discoveries about the most complicated structure in all of creation: the living cell. They will see the intricate detail that God has built into living things and His master plan for transmitting information within an organism and from one generation of organisms to the next. Students will also understand just how far man still has to go to gain a complete understanding of God's living creation.

Added Enrichment

- Feature articles with information about God's design, provision, and the wonders of His creation (72)
- Laboratory exercises (25); field-study projects (3)
- Application and Critical Thinking questions for every chapter

Evaluation

- Reading quizzes (16)
- Review quizzes (37)
- STEM project (counts as 6 quiz grades and 1 test grade)
- Tests (8), Quarter Exam (2)
- Semester Exam, Final Exam

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Botany

- Angiosperms:
  - Introduction to biology: definition and major fields of study
  - Parts of a green plant: flowers, leaves, stems, roots
  - Nitrogen cycle
  - Families of angiosperms:
    - Composite, mint, parsley, rose, pea, lily
    - ➤ Mustard, nightshade, cashew
  - Monocots and dicots:
    - Types of angiosperms: characteristics of monocots and dicots
  - Grasses:
    - Cereal crops
    - ➤ Turf grasses, other grasses
  - Broadleaf trees:
    - Observing trees, characteristics of trees
    - ➤ Guide to familiar American broadleaf trees by groups—bark, leaves, fruits, and crown shapes are pictured and explained
- Leaves:
  - ➤ Systems and organs in plants
  - External structure of leaves:
    - Leaf shapes
    - Parts of a leaf:
      - ➤ Stipule
    - Simple and compound leaves
  - Arrangement of leaves on stems:
    - Nodes, opposite, alternate, whorled, and rosette
    - Phototropism
  - ➤ Three types of plant tissues: structural, vascular, and meristematic
  - Structure of leaves:
    - ➤ Epidermis, mesophyll
    - Veins, parts of plant cells
  - Photosynthesis:
    - ➤ Thylakoids, light and dark reactions
    - Products of photosynthesis
    - ➤ Factors that influence photosynthesis
  - Fall coloration of leaves and special leaves:
    - Leaf pigments, abscission layer
    - ➤ Cellulase
  - ➤ Water pressure and wilting
- Flowers, fruits, and seeds:
  - Flower parts:
    - Sepals, petals, stamen, pistil
    - ➤ Complete and incomplete flowers
    - ➤ Monoecious vs. dioecious
  - ➤ Factors affecting flowering: photoperiodism
  - Development of fruits and seeds: pollination, fertilization
  - Formation, types, and function of fruits:
    - ➤ Simple, aggregate, and multiple fruits
    - Seed dispersal
  - Structure of seeds: parts of the embryo, germination
- Stems and roots:
  - External structure of woody stems:
    - Buds, scales, bud-scale scars, growth
    - ➤ Bundle scars
  - Internal structure of woody stems:
    - Bark, pith
    - Wood:
      - Heartwood, sapwood, annual rings
      - ➤ Tracheids
  - ➤ Herbaceous stems: dicots and monocots
  - Vegetative reproduction:
    - ➤ Asexual reproduction, cutting, layering, grafting, budding, culturing
  - Special stems: bulbs, corms, rhizomes, stolons, tendrils, tubers, thorns
  - ➤ Plant hormones
  - Root systems:
    - Taproots, fibrous roots
    - Structure:
      - Root hairs, root cortex
      - ➤ Epidermis, central vascular cylinder
    - Primary and secondary growth
  - Root's absorption and transportation of water:
    - Diffusion, osmosis, capillarity
    - ➤ Sap stream

Biology cont. p. 194

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SCIENCE: *Biology* *cont.*

Botany *cont.*

- Variety in the world of plants:
  - Classification:
    - Linnaeus, John Ray
    - Kingdom, phylum, class, order, family, genus, species, scientific name
    - ➤ Domains, phylogeny
  - Conifers and other gymnosperms:
    - Characteristics and reproduction of conifers, cycads, and ginkgo trees
    - ➤ Gnetophytes
  - Ferns, club mosses, and horsetails:
    - Spores
    - ➤ Structures and life cycle of ferns; alternation of generations
    - Club mosses, horsetails
    - ➤ Lycopodium
  - Mosses and liverworts:
    - Structures of moss
    - ➤ Uses, types and life cycle of mosses
    - Liverwort characteristics
  - Algae:
    - Characteristics
    - Green algae:
      - ➤ Desmids
    - Brown algae:
      - ➤ Gulfweed
    - Yellow, red, and blue-green algae
    - ➤ Dinoflagellates
    - ➤ Eutrophication
  - Fungi:
    - Importance
    - Club fungi:
      - ➤ Rust life cycle
    - Molds:
      - ➤ Parasitic molds
    - Sac fungi
    - ➤ Slime molds
    - Lichens

Human Anatomy & Physiology

- Fearfully and wonderfully made:
  - Wonders of the human body: the crown of God's creation
  - Introduction to body cavities:
    - ➤ Cranial, spinal
    - Thoracic, abdominal
  - Body systems: introduction to eleven systems
    - ➤ Homeostasis and feedback mechanisms
  - Tissues:
    - Four main types
    - Tissue fluids
    - ➤ Membranes: four main types
    - Cells
    - ➤ Matrix
  - Vestigial organs: brief discussion
- Bones and muscles:
  - ➤ Detailed discussion of axial skeleton
  - ➤ Detailed discussion of appendicular skeleton
  - Bones:
    - Classification
    - Structure:
      - ➤ Diaphysis, epiphysis, medullary cavity
    - ➤ Tissues
    - Bone growth and development:
      - ➤ Maintenance
      - Nutrition
      - Exercise:
        - ➤ Wolff's law
      - ➤ Construction
      - Fracture and repair
  - Joints:
    - ➤ Synovial fluid
    - Ligaments, types of joints, problems with joints
  - Muscles:
    - Types
    - ➤ Specific muscles for moving different parts of the body
  - Structure of skeletal muscles:
    - ➤ Fascia, tendons, fibers, and neuromuscular junction; muscle control
  - Muscles and exercise: hypertrophy, atrophy, red and white fibers
- The nervous system:
  - Divisions of the nervous system:
    - Central nervous system:
      - ➤ Glial cells, gray and white matter, myelin, ganglia, plexus, poliomyelitis
    - Peripheral nervous system:
      - ➤ Mixed nerves
    - Autonomic nervous system
  - ➤ Nerves: median nerve, Schwann cells, multiple sclerosis
  - How neurons work:
    - ➤ Action potential
    - Synapse, neurotransmitter
    - ➤ Inhibitors
    - Parkinson's disease
  - Reflex action:
    - ➤ Reflex arc
  - Parts of the brain:
    - Cerebrum:
      - Hemispheres
      - ➤ Corpus callosum
      - Cerebral cortex, lobes, cerebral palsy
    - Cerebellum:
      - Location
      - ➤ Structure
      - Function, purpose
    - Brain stem: medulla oblongata, pons, midbrain, reticular formation
    - Limbic system:
      - Thalamus, hypothalamus
      - ➤ Hippocampus, amygdala
  - The mind and the brain:
    - ➤ Behaviorism
  - Neurological health:
    - Caring for the nervous system:
      - ➤ REM sleep
    - Importance of avoiding alcohol:
      - ➤ Neuritis

Biology cont. p. 195

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SCIENCE: *Biology* *cont.*

Human Anatomy & Physiology *cont.*

- Injuries to the nervous system:
  - ➤ Sciatica
  - Stroke, concussion, amnesia, coma
- Neurological diseases:
  - Tetanus, Alzheimer's disease, epilepsy
  - Dementia:
    - ➤ Acute confusion, senile dementia
    - Arteriosclerotic dementia
- Senses:
  - ➤ Somatic vs. special senses
  - Skin sensations
  - Chemical senses (taste and smell):
    - ➤ Taste bud structure
    - ➤ Primary odors
- Hearing:
  - ➤ Malleus, incus, stapes
  - ➤ Tinnitus
- Vision:
  - Protection of the eye: socket, eyelid, lacrimal glands
  - ➤ Eye movement
  - Eye structure and function:
    - Sclera
    - Uvea:
      - ➤ Choroid, ciliary body
      - Iris, pupil
    - Retina:
      - ➤ Fovea
      - ➤ Structure and function of rod and cone cells; rhodopsin; color vision, persistence of vision
      - ➤ Blind spot
      - ➤ Aqueous humor, vitreous humor
    - Lens
- Defective vision:
  - Nearsightedness, farsightedness, astigmatism, night blindness
  - ➤ Presbyopia, colorblindness
- ➤ Glaucoma

- Nutrition and digestion:
  - Nutrients and energy:
    - Calories, metabolism
    - ➤ Obesity
    - Macronutrients
      - Carbohydrates, proteins, lipids
    - Micronutrients
      - Vitamins, minerals and water:
        - Coenzymes
        - Edema
  - Beginning of the digestive system:
    - Alimentary canal, digestion, enzymes, glands
    - Oral cavity:
      - ➤ Palate, bolus, papillae
      - ➤ Wisdom tooth, impacted, mastication
    - Esophagus: peristalsis, epiglottis
  - Stomach and intestines:
    - Stomach structure and function:
      - ➤ Hunger contractions
      - Gastric juice, hydrochloric acid, chyme
      - ➤ Intrinsic factor
      - ➤ Cardiac and pyloric sphincters
    - The liver and pancreas in digestion:
      - Bile, gallbladder
      - ➤ Bile salts, emulsification, common bile duct
      - Pancreatic juice
      - ➤ Sodium bicarbonate production by the pancreas
    - Small intestine:
      - Primary organ of digestion and absorption
      - Divisions of the small intestine
      - Villi
      - ➤ Microvilli, lacteal
      - Insulin, glucagon
      - ➤ Urea
    - Large intestine: function and structure
      - ➤ Divisions of the large intestine
  - Gastrointestinal disorders:
    - Food poisoning
    - ➤ Dyspepsia
    - Ulcers, effects of alcohol
    - ➤ Constipation, diarrhea
    - Dysentery, colon cancer
- Circulation and respiration:
  - Blood: cardiovascular system, arteries, veins, capillaries
  - Composition of blood:
    - Plasma, red blood cells, white blood cells, platelets:
      - ➤ Plasma proteins, circulatory shock
      - ➤ Red blood cell production, leukemia
  - ➤ Blood types: antigens, ABO blood group, universal donors and recipients, Rh blood group
  - Design of the heart:
    - Structure:
      - ➤ Layers, valves, and skeleton
    - Blood flow:
      - Through the heart
      - ➤ To the heart
  - ➤ Detailed structure and function of cardiac muscle, electrical system, heart beats
  - ➤ Types, symptoms, and treatment of heart failure
  - Circulation of blood:
    - Arteries, veins, and capillaries:
      - ➤ Structure of blood vessels
    - Atherosclerosis
    - ➤ Branches of systemic circulation
    - Pulmonary circulation
    - Blood pressure and pulse
  - Cardiovascular health: leading cause of death
  - Anatomy and function of respiratory system:
    - ➤ Types of respiration: external, internal, and cellular
    - Organs of respiration:
      - ➤ Nasal meatuses
      - Throat structures
      - Trachea, bronchi
      - Lungs:
        - Bronchitis, pneumonia, bronchial asthma
        - Pleural membrane:
          - ➤ Pleurisy
      - Diaphragm

Biology cont. p. 196

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SCIENCE: *Biology* *cont.*

Human Anatomy & Physiology *cont.*

- The breathing process:
  - ➤ Role of intercostal muscles
  - ➤ Control by the medulla oblongata
  - Lung capacity:
    - Vital capacity
    - ➤ Tidal volume
- Respiratory diseases:
  - Common cold, influenza, tuberculosis, emphysema, lung cancer
  - ➤ Cystic fibrosis
- Integumentary, excretory, endocrine, and reproductive systems:
  - ➤ Introduction: body's design for maintaining homeostasis
  - Integumentary system:
    - Purpose
    - Structure:
      - ➤ Psoriasis, keratin in skin, skin pigments
    - Tanning, sunburn
    - ➤ Hair structure
    - Sebaceous glands
    - ➤ Details of sweat glands
  - Excretory system:
    - Kidneys:
      - ➤ Function, regulation, structures, failure, dialysis
  - Endocrine system:
    - ➤ Endocrine vs. exocrine glands
    - Hormones:
      - ➤ Hormone receptors
    - Pituitary gland:
      - Hypothalmus, somatotropin
      - ➤ Disorders: pituitary gigantism, pituitary dwarfism, acromegaly
      - ➤ Gonadotropins
    - Thyroid and parathyroid glands:
      - Thyroxine
      - Thyroid disorders:
        - ➤ Cretinism, hypothyroidism, hyperthyroidism
        - Simple goiter
    - Pancreas (endocrine function): islets of Langerhans, insulin, glucagon, diabetes mellitus
    - Adrenal glands: epinephrine, steroid hormones, cortisol, aldosterone
    - Pineal gland: melatonin
  - Reproductive system
    - ➤ Gametes
    - Gonads:
      - Endocrine function: adolescence, puberty, secondary sex characteristics
    - ➤ Major organs
      - Prenatal development
      - ➤ Gestation, trimesters, primary germ layers, chorion, digestive tube, neural plate, labor
      - Sexual morality
- Disease and the body's immune system:
  - Introduction: disease, microbes, pathogen, infectious and noninfectious, acute, chronic
  - Noninfectious diseases: degenerative, immunological, hormonal, congenital and genetic, nutritional, harmful substances, cancer
  - Infectious diseases:
    - Communicable and noncommunicable
    - Bacteria:
      - Structure:
        - ➤ Plasmids
      - ➤ Types, variations and shapes, reproduction
      - ➤ Disease:
        - ➤ Germ concept of disease, Koch's postulates
        - ➤ Pathogenic activity
    - Viruses:
      - ➤ Replication, diseases
    - Protozoa, fungi, parasites
  - How infectious diseases are spread:
    - ➤ Droplet infection, carrier
    - Vector, sexually transmitted diseases
    - ➤ Incubation
  - Preventing the spread of disease: epidemic, pandemic, vaccination
  - Immune system:
    - Overview, white blood cells
    - ➤ Histamine, interferon
    - Antibodies
    - ➤ Specific vs. nonspecific defenses
    - ➤ Table of white blood cell types
    - Lymphatic system:
      - Lymph, vessels, ducts, nodes
      - ➤ Structure and function of lymph nodes
      - Other organs
    - Other defenses: skin barrier, mucous membranes, lysozymes, fever, microorganisms of digestion
    - Acquired immunity, innate immunity
    - Immune deficiency diseases (HIV, AIDS)
  - Medical defenses against disease:
    - ➤ Immune therapy, serums
    - Chemotherapy, antibiotics
  - Prevention: nutrition, rest, exercise

Life Sciences: Methodology & Philosophy

- Natural history and scientific investigation:
  - Natural history through the ages:
    - Bible beginnings, Hebrews
    - Greeks:
      - ➤ Anaximander, Plato, Aristotle
    - Romans:
      - ➤ Pliny, Galen
    - Ancient science vs. the Bible
    - Middle Ages:
      - ➤ Nestorians
  - Modern science: Protestant Reformation, advances in biological sciences, microscopy, cell theory
  - Biology and scientific investigation:
    - Scripture and scientific investigation, scientific method
    - Repudiation of spontaneous generation, law of biogenesis
    - Limitations of science
    - Scientism
- Evolution—a retreat from science:
  - Science and faith: great founders of science believed in God and creation
  - Rejecting the truth:
    - Darwin and Lyell, natural selection
    - ➤ Effects of naturalism

Biology cont. p. 197

➤ **RED** *indicates first introduction of content.*

SCIENCE: *Biology* *cont.*

Life Sciences: Methodology & Philosophy *cont.*

- Paleontology:
  - Evidence against evolution, speciation, macroevolution, fossils
  - Transitional forms and lack thereof
  - Punctuated equilibrium hypothesis
  - Geologic column, radiometric dating, Cambrian explosion
  - Coelacanth, *Archaeopteryx,* horse series
  - Hominid fossils, Neanderthal, Cro-Magnon
- Biological evidence against evolution:
  - Impossible transitional forms:
    - ➤ Bat wings, avian respiratory system
  - Homology
  - Molecular biology: design and complexity
  - Genetics: limited variety, mutations
  - Natural selection and genetic variety:
    - Peppered moth
    - Pesticide-resistant insects, antibiotic-resistant bacteria
    - ➤ Bacterial proliferation
  - Embryonic recapitulation
- ➤ Why evolution cannot be properly called a science
- ➤ Threat of evolution to modern science

Ecology

- Introduction of basic terms: ecology, habitat, biotic and abiotic factors
- Levels of ecology: biosphere, biomes, ecosystems, community, population, organism
  - ➤ Ecological stability
- Influences in the ecosystem: biodiversity, carrying capacity, types of abiotic and biotic factors
- Nutritional relationships in an ecosystem:
  - Producers and consumers, trophic level, food chain, food web, niches
  - ➤ Energy flow, pyramid diagrams
- Special nutritional relationships:
  - Symbiosis, predation, competition
  - ➤ Amensalism
  - Neutralism
  - ➤ Herbivory
- Nutrient cycles:
  - Hydrologic, atmospheric, sedimentary cycles
  - ➤ Carbon-oxygen, phosphorous cycles
- Major biomes:
  - Tundra, northern coniferous forest, temperate deciduous forest
  - Grassland, desert, tropical rain forest
  - Aquatic biomes:
    - Freshwater
    - Marine:
      - ➤ Estuary
- Ecological succession and man's role:
  - ➤ Primary succession, secondary succession
  - Dominion and stewardship

Zoology

- Mammals:
  - Characteristics of animals, vertebrates, and mammals:
    - Mobility, diversity, symmetry
  - Types of mammal reproduction
  - 18 mammal orders: discussed with representative animals
  - ➤ Extinct mammals
- Birds:
  - Feathered vertebrates:
    - Characteristics for flight
    - Backyard and roadside birds
    - Groups of birds:
      - Perching, birds of prey, swimming and wading, game, tropical, flightless
      - ➤ Extinct birds
  - Avian anatomy and physiology:
    - Feathers, skeletal and muscular systems
    - ➤ Nervous system: brain, senses
    - Food and digestion:
      - ➤ Intestine, cloaca, bursa of Fabricus
    - ➤ Excretory system
    - Circulatory system:
      - ➤ Nucleated red blood cells
    - ➤ Details of respiratory system
  - Family life of birds:
    - Migration, courtship
    - ➤ Mating and fertilization
    - Egg, nesting, incubation
    - ➤ Care of young
- Reptiles and amphibians:
  - Reptiles:
    - Cold-blooded, similar traits
    - Lizards: habitat, sizes, poisonous lizards, colorful, detached tails and other defenses, and eating habits
    - Snakes:
      - Sizes, methods of locomotion, scaly skin
      - Sense organs:
        - ➤ Scale-covered eyes, hearing (quadrate bone)
        - Smell: Jacobson's organ
      - Design for feeding, groups of snakes, venom, snakebite treatment
    - Turtles:
      - Reptiles with shells
      - Characteristics:
        - ➤ Tympanic and nictitating membranes
      - Groups
    - Crocodilians
    - Tuatara: parietal eye
    - Dinosaurs and similar creatures: extinct reptiles, types and characteristics
  - Amphibians:
    - Vertebrates with a double life:
      - Characteristics:
        - ➤ Three-chambered heart

Biology cont. p. 198

➤ **RED** *indicates first introduction of content.*

SCIENCE: *Biology* *cont.*

Zoology *cont.*

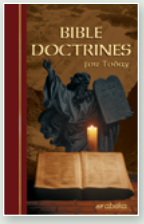
- Frogs and toads:
  - ➤ Coloring
  - Toxic skin secretions
  - ➤ External fertilization
  - Development and metamorphosis
  - ➤ Anatomy: head, oral cavity, body systems
- Salamanders:
  - Reproduction and metamorphosis:
    - ➤ Spermatophore, paedomorphosis
  - Sizes; notable salamanders
- Caecilians

- Fish:
  - Bony fish:
    - Abundance and importance
    - ➤ Detailed study of anatomy and physiology
  - Cartilaginous fish: sharks, rays, and chimaeras; lampreys, hagfish
- Arthropods:
  - Common characteristics, classes
  - Insects:
    - Life cycle of insects
    - ➤ Grasshopper anatomy and physiology
    - Orders of insects and their economic significance: 8 of the more than 25 orders are taught
    - Insects and man
      - ➤ Genetic control
  - Arachnids:
    - Spiders:
      - External anatomy
      - ➤ Internal anatomy, reproduction
    - Harvestmen, scorpions, mites, and ticks
    - Centipedes and millipedes
  - Crustaceans:
    - ➤ Anatomy and life cycle of crayfish
    - Other crustaceans
  - ➤ Extinct arthropods
- Other invertebrates:
  - Mollusks:
    - General characteristics
    - Bivalves, gastropods, cephalopods
  - Enchinoderms:
    - Starfish anatomy
  - ➤ Rotifers: parthenogenic
  - Coelenterates and porifera:
    - Coelenterates: hollow-intestined invertebrates, polyp, medusa, hydra, jellyfish, sea anemones, corals
    - Porifera (sponges):
      - ➤ Anatomy and physiology
  - Annelids:
    - Earthworms:
      - Characteristics and anatomy and physiology
    - ➤ Sea worms
    - Leeches
  - Flatworms and roundworms:
    - Platyhelminths:
      - ➤ Anatomy of planarians, flukes, and tapeworms
    - Nematodes:
      - ➤ Filaria, hookworm, trichina, ascaris
  - Protozoa:
    - Flagellates:
      - Euglena:
        - ➤ Pellicle, binary fission
      - Trypanosome
    - Sarcodines:
      - Amoeba
      - ➤ Foraminifera, radiolarla
    - Ciliates: paramecia, other ciliates
    - Sporozoans

Cellular & Molecular Biology

- Cytology—design and function of cells:
  - Variety and complexity of cells:
    - Discovery of cells
    - ➤ Variety in cells, complexity of cells
  - Design of cells:
    - ➤ Details of cell structure and organelles
  - ➤ Life and work of cells:
    - ➤ Maintaining life, photosynthesis and cellular respiration
    - ➤ Membrane transport, endocytosis and exocytosis, cell movement, cilia and flagella
    - ➤ Cell cycle and mitosis, chromosomes, cell death
- Heredity: continuity of life:
  - God's provision for the continuity of life:
    - Heredity, genes
    - ➤ Differentiation, sexual reproduction, meiosis
  - ➤ Classical genetics:
    - ➤ Mendel's experiments, law of dominance, genotype and phenotype
    - ➤ Punnett squares, hybrids and hybridization, law of segregation
    - ➤ Incomplete dominance, law of independent assortment, linkage
    - ➤ Sutton's hypothesis
    - ➤ Morgan's research, sex chromosomes, sex-linked traits
  - ➤ Human genetics:
    - ➤ Dominant gene inheritance, codominance
    - ➤ Multiple allele inheritance
    - ➤ Pleiotropy and polygenic inheritance
    - ➤ Sex-linked disorders, genetic advances, eugenics
- DNA—regulation of life:
  - DNA:
    - Deoxyribonucleic acid
    - ➤ Watson and Crick, storage as chromatin
    - ➤ Structure of RNA and DNA, bases, base pairing
  - Activities of DNA:
    - ➤ Central dogma of molecular biology, DNA replication, telomeres
    - ➤ Transcription, mRNA, translation, rRNA, tRNA
    - ➤ Noncoding DNA, intron, exon, small RNA
    - ➤ Genetic engineering, cloning
    - Mutations

BIBLE: *Bible Doctrines*



Christians need to know what they believe and why they believe it so they can be built up in their faith and equipped to present their beliefs intelligently and effectively to others. *Bible Doctrines for Today* is written as a practical, personal study designed to reach both the head and the heart of the student. It covers all major doctrines: the Bible, God, Christ, the Holy Spirit, man, salvation, the Church, angels, and end times. Important terms and definitions of these doctrines will be explained, illustrated, and applied to the student's life. Many memory verses are correlated with the text to confirm the doctrinal truths being presented.

Evaluation

- Verses:
  - Verse quizzes (28)
  - 9-weeks verses exams (2)
  - Semester verses exam (1)
  - Final verses exam (1)
- Content:
  - Quiz on the books of the Bible (1)
  - Quizzes (8)
  - 9-weeks exams (2)
  - Semester exam (1)
  - Final content exam (1)

➤ **RED** *indicates first introduction of content.*

Lessons *137*

- Various biblical doctrines such as: Bibliology (18 lessons), Theology (16), Christology (12), Pneumatology (6), Anthropology (9), Soteriology (11), Ecclesiology (8), Angelology (9), and Eschatology (18)
- Bibliology—doctrine of the Bible:
  - Revelation and inspiration of the Scriptures
  - Authenticity, credibility, and canonicity of the Scriptures
- Theology—doctrine of God:
  - Arguments for His existence
  - Attributes, sovereignty, nature, and names of God
  - His work of Creation and providence
- Christology—doctrine of Christ:
  - Names and nature of Jesus Christ
  - Significance of Christ's supernatural life
  - Humiliation, crucifixion, resurrection, and exaltation of Jesus Christ
- Pneumatology—doctrine of the Holy Spirit:
  - Holy Spirit's past and present work
  - Gifts and graces of the Holy Spirit
  - Blasphemy against the Holy Spirit
- Anthropology—doctrine of man:
  - Origin of man and sin on earth
  - Seriousness of sin
- Soteriology—doctrine of salvation:
  - Necessity of and faith for salvation
  - Justification, sanctification, and adoption
  - Blessings and assurance of salvation
- Ecclesiology—doctrine of the church:
  - Organization, ordinance, and mission of the church
- Angelology—doctrine of angels:
  - Names and titles of specific angels
  - Satan: his present and future position
- Eschatology—doctrine of last things:
  - The rapture of the church
  - Judgment Seat of Christ for the saved
  - Tribulation on earth
  - Christ's second coming to earth and millennial reign
  - Great White Throne Judgment for the lost
  - Personal eschatology
  - Reality of heaven and hell

Music *90 songs*

- Hymns of the faith, gospel songs, choruses, holiday songs

Memory Work

- Passages (32 containing 94 verses)
  - Salvation (5)
  - The authenticity of the Scriptures (6)
  - The Man of sorrows (6)
  - Being wise (3)
  - Being of one mind (4)
  - Preeminence of Christ (4)
  - The Everlasting and All-Knowing God (10)
  - Praises to God (3)
  - Serving with gladness (5)
- Books of the Bible

Prayer Time

- Learn to pray for each other, our nation, those in authority over us