

ENGLISH: Grammar & Composition



The abilities to express ideas creatively and to skillfully comprehend the written word are built upon the study elements which are included in English 11. The *Handbook of Grammar and Composition* and *Workbook V* build upon the grammar foundation established in previous years and introduce new concepts to further enhance the students' knowledge of basic grammar. In addition, *Handbook of Grammar and Composition* emphasizes writing through assignments in argumentative essay, narrative essay, exposition of a process, literary character analysis, critical book reviews, and a research paper. Several smaller writing assignments are also included throughout the text.

Added Enrichment

- Review games

Evaluation

- Grammar quizzes (17)
- Tests (8), 9-weeks exams (2)
- Semester exam, final exam
- Compositions:
 - Character trait paragraph
 - Book reviews: oral, full (1 each)
 - Paragraph, character sketch (1 each)
- Essays: argumentative, narrative (1 each)
- Character analysis, rhyming poem, classification, application letter, résumé, research paper (1 each)
- Optional (graded at teacher discretion):
 - Paragraphs, short book reviews
 - Character analysis, one-act play, outline, essay
 - Summary, descriptions, type sketch, poems
 - Exposition of a process

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Grammar

- 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, abbreviations, 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
 - 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

ENGLISH: Grammar & Composition *cont.*

Grammar *cont.*

- With s to form plurals of letters, numbers, signs, and words used as words
- 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
- Parentheses:
 - To enclose:
 - Parenthetical elements
 - Brief confirmatory information
- Brackets:
 - To enclose editorial comments within quotations
 - To replace parentheses within parentheses
- 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
 - Subject before its appositive
 - Verb phrase that is interrupted by other words
 - Diagraming subjects and verbs
 - Recognizing and diagraming:
 - Compound subjects and verbs
 - Complements: direct object, indirect object, objective complement, predicate nominative, predicate adjective
 - Fragments and run-on sentences
 - Recognizing and diagraming simple, compound, complex, and compound-complex sentences
 - Sentence improvement:
 - Unity and coordination
 - Subordination:
 - Choosing what to subordinate
 - Avoiding upside-down, illogical, and excessive subordination
 - Placement of modifiers:
 - Avoid:
 - Squinting modifiers and split constructions
 - Dangling participial phrases
 - Dangling gerund and infinitive phrases
 - Elliptical clauses
 - Pronoun reference
 - Clear and logical construction
 - Parallelism
 - Point of view:
 - Avoid unnecessary shifts in:
 - Subject, voice, and tense
 - Mood, person, number, discourse, and tone
 - Consistency of subject, tense, or voice
 - Clear and effective diction
 - Conciseness
 - 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: progressive and emphatic forms
 - When to use the verb tenses
 - Using logical verb tense sequence between clauses and between verbals and independent clause
 - Avoiding unnecessary shifts in sentences: in subjects, verb tense, voice of verbs
 - 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 diagraming nouns as predicate nominatives, direct objects, indirect objects, objects of prepositions, direct address, appositives, and objective complements
 - Using parallelism
- Pronouns:
 - Antecedents
 - Recognizing personal, interrogative, demonstrative, indefinite, compound, relative
 - Recognizing reflexive and intensive pronouns
 - Keeping agreement of verbs and indefinite pronoun subjects
 - Making pronouns agree with their antecedents:
 - In number and in gender
 - In person
 - Nominative case:
 - For subjects, predicate nominatives
 - For appositives of subjects, appositives of predicate nominatives
 - For appositives to subjects, appositives to predicate nominatives
 - For complements of the infinitive to *be*
 - 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
 - For subjects of infinitives and complements of the infinitive to *be*
 - 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 diagraming adjectives: participles and proper adjectives and infinitives as adjectives

ENGLISH: Grammar & Composition *cont.*

Grammar *cont.*

- 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
- Placing and punctuating adjective modifiers
- Using adjectives in comparison
- Avoiding double comparison and double negatives
- Adverbs:
 - Recognizing and diagramming adverbs
 - Infinitives as adverbs
 - Nouns as adverbs
 - Distinguishing adverbs from adjectives
 - Using and diagramming:
 - Prepositional phrases as adverbs
 - Infinitive phrases as adverbs
 - Adverb clauses
 - Correct placement of adverb modifiers
 - Distinguishing dependent clauses
 - 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
 - Using parallel structure
- Interjections:
 - Definition
 - Punctuation with interjections
 - Other parts of speech used as interjections
 - Diagramming interjections
- Recognizing and diagramming:
 - Nominative absolute and expletives
 - Nominative absolute phrases
- Word study:
 - Using the dictionary:
 - Kinds of dictionaries
 - Selecting a dictionary
 - Using the dictionary
 - Parts of the dictionary
- Usage and diction:
 - Levels of usage
 - Using correct diction
 - Using clear and effective diction
 - Appropriateness
 - Exactness and vividness
 - Figurative language
 - Gobbledygook
 - Jargon
 - Triteness

- Wordiness:
 - Sentences beginning with *there*, *it*, and *this*
 - Wordy expressions
 - Redundancies
- Glossary of diction

Composition

- Manuscript form:
 - Abbreviations, numbers, titles
 - Abbreviations in footnotes and parenthetical references
- The Writing Process: plan, write, rewrite, edit
- Introducing paragraphs (7):
 - Topic sentence
 - Summarizing sentence
 - Paragraph development by examples, incidents, reasons, comparison and contrast, and combination of methods
 - Paragraph unity
 - Paragraph coherence: chronological order, order of importance, transitional expressions, space order, pronoun reference, and repetition
 - Paragraph with proper emphasis
- Essays:
 - Essay answer
 - Narrative essay
 - Argumentative essay
- Outline:
 - Topical and sentence outlines
 - Format of outline
 - Parallelism in an outline
 - Steps to preparing an outline
- Paraphrase (5)
- Summaries (6)
- Writing about a process (Exposition of a Process)
- Classification paper
- Extended definition
- Writing descriptions about persons, places, and things:
 - Steps: point of view, careful selection of details, arrangement of details, use of exact nouns and verbs
- Character sketch
- Type sketch
- Character analysis
- The library:
 - The catalog
 - The reference section:
 - Encyclopedias, dictionaries, special dictionaries, atlases
 - Handbooks of miscellaneous information, books of quotations
 - Biographical aids, reference works on literature
 - Other specialized reference works
 - *The Readers' Guide to Periodical Literature*
 - Internet sources
 - The Dewey Decimal System
 - The Library of Congress Classification System
- Critical book reviews: written and oral review
- Writing letters:
 - Friendly: letter parts, thank-you note, bread-and-butter note
 - Business:
 - Letter parts, order letter, request letter, complaint letter
 - Letter to a government official
 - Letter of application, résumé

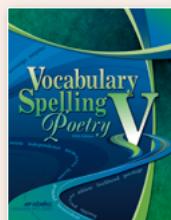
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ENGLISH: Grammar & Composition *cont.*

Composition *cont.*

- Research paper:
 - Planning the paper:
 - Selecting subject
 - Finding sources:
 - Encyclopedia, periodical databases
 - *Essay and General Literature Index*, published bibliographies
 - Writing bibliography cards
 - Making a preliminary outline
 - Taking notes: writing note cards, avoiding plagiarism
 - Writing the paper: introduction, body
 - Using parenthetical citations
 - Rewriting the paper: check organization, introduction, conclusion, unity, coherence, and citations
- Editing the paper: check each paragraph, sentence, word; capitalization and punctuation
- Typing the paper:
 - General information
 - Formatting pages: title page, pledge page, outline page, first page, and succeeding pages
 - Inserting footnotes or endnotes
- **Additional guidelines:**
 - Abbreviations in citation entries
 - Ellipsis marks in quotations
 - Block quotations
- Documentation for research paper:
 - Parenthetical citations
 - Endnotes and footnotes
 - Typing instructions

ENGLISH: Vocabulary, Spelling, Poetry



Mastering the vocabulary and spelling words in *Vocabulary, Spelling, Poetry V* will greatly help students in their writing, speaking, and reading comprehension. Students will memorize nine poems throughout the year. The benefits of reciting and memorizing poetry are learning an appreciation of poetic excellence, enriching their personal lives, and laying a foundation for future literature studies. Students will also further develop their ability to analyze words by studying prefixes, roots, and suffixes.

Added Enrichment

- Spelling and vocabulary:
 - Spelling lists (24):
 - Spelling words (360)
 - Vocabulary words (144)
 - Organized by spelling rules, suffixes, homonyms, compound words, and commonly misspelled words
 - Vocabulary lists:
 - Organized by word origin, prefixes and suffixes, and vivid and precise verbs
 - Each vocabulary word includes:
 - Pronunciation, etymology
 - Part of speech, definition
 - Sample sentence
- Synonyms, antonyms
 - Related forms of the word
- Practice exercises (100), including:
 - Pretest over vocabulary words and their meanings
 - Cumulative review of vocabulary words and definitions
 - Review games
- Vocabulary chart showing:
 - Prefixes (48), suffixes (48)
 - Greek and Latin roots and meanings (100)
 - Guidelines for solving analogy questions
 - Pronunciation key
 - Index includes vocabulary words; prefixes, roots, suffixes; synonyms, antonyms

Evaluation

- Spelling and vocabulary quizzes:
 - Weekly (20)
 - Quarterly review (1 each 9 weeks; each counts as 2 quiz grades)
- Poetry quizzes: written (7), oral (2)

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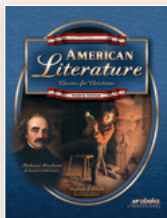
Spelling & Vocabulary Skills Development

- Master spelling lists including:
 - Vocabulary words and definitions
 - Words that follow the spelling rules
 - Sound-alike suffixes
 - Commonly misspelled words
 - Homonyms
- 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
- Learn to distinguish between homophones
- Learn practical spelling tips and suggestions from *Keys to Good Spelling*
- Master 48 prefixes, 100 roots, and 48 suffixes

Poetry Skills Development

- Memorize 9 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

ENGLISH: *Literature*



American Literature presents a variety of selections that reflect the faith, doubts, longings, accomplishments, and emotions of the American people. Students will further develop their skills in analyzing literature as they study several genres and time periods of American literature. In addition, students will learn about significant American authors and their influential works while reading classics such as *Moby Dick*, *Ben Hur*, *Uncle Tom’s Cabin*, *The Innocents Abroad*, and *The Song of Hiawatha*. Since art appreciation is an important part of the literature study in English 11, *American Literature* includes paintings that reflect the themes and time periods of each unit.

Literary Value

- 105 authors, including works by well-known writers such as Washington Irving, Will Rogers, Mark Twain, Phyllis Wheatley, and Walt Whitman
- Prose selections (45), poems (175), plays (2), essays (25)

Added Enrichment

- Footnotes to define and explain unfamiliar words
- Comprehension and discussion questions after selections
- Character-building quotations and verses
- Introductory paragraphs for interest and background info
- Author biographies
- Literary terms defined and explained throughout
- Glossaries of literary terms and vocabulary-building words
- Unit reviews

Evaluation

- Comprehension quizzes (18)
- Homework reading quizzes (35)
- Tests (8), 9-weeks exams (2)
- Semester exam, final exam

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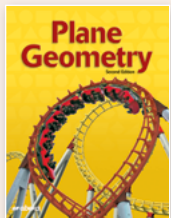
Reading Skills Development

- Develop skills in reading speed and comprehension
- Further develop oral reading skills
- Be able to identify significant quotations and the selections in which they are featured
- Increase vocabulary
- Further develop writing skills
- Study various literary forms: short story, essay, novel, narrative poetry, and descriptive poetry
- Study meaning and use of literary terms and devices such as theme, plot, imagery, figurative language, **aphorism, character analysis, conceit, dialect, epitaph, local color, pun, realism, rhetorical devices, and understatement**
- Study the development of plot, theme, setting, and character(s) in short stories, essays, and classical works of literature
- **Study historical backgrounds and writing techniques to better understand American literary periods**

Comprehension, Discussion & Analysis Skills Development

- **Read entire novel: *The Scarlet Letter***
- 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
- Develop an understanding of people’s motives and feelings while recognizing consequences of particular actions
- 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
- **Develop a greater understanding and appreciation for American culture and heritage**

MATHEMATICS: *Plane Geometry*



Plane Geometry teaches students how to use known facts to verify the truth of additional facts, to solve geometric problems, and to use deductive reasoning for drawing correct conclusions. Students learn to think *naturally, logically, and systematically* whenever they encounter a proof to write, a construction to make, or a problem to solve. They are then equipped throughout life to perform such tasks as determining which car is the better buy or identifying truth and flaws in politics.

For this grade level, see also *Precalculus* on p. 221.

Also available: *Consumer Mathematics* and *Business Mathematics* on Electives pp. 239–243.

Topical Interest Essays

- Geometry Past and Present; Geometry and the Pyramids
- Euclid, Master of Logic; Geometry and Solomon's Temple
- Archimedes, Greatest Mathematician of Antiquity
- Geometry and the Parthenon; Blaise Pascal, Inventor, Mathematician, Writer
- The Golden Ratio; Leibniz, Universal Genius
- Notre Dame de Paris; Isaac Barrow, Teacher, Friend of Isaac Newton
- Kaleidoscope; Sir Christopher Wren, Mathematician and Architect
- The value of π ; Symmetry in Nature

5 Final Review Exercises Quick Reference & Summaries

- Conversion tables, plane geometry notation and formulas
- Basic mathematics axioms, geometry principles, postulates, and informal statements
- Theorems and corollaries, properties of proportions, transformations
- Constructions, proof methods, factual summaries

Evaluation

- Quizzes (50)
- Tests (8)
- 9-weeks exams (2)
- Semester exam, final exam

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

Introduction to Geometry

- Geometry defined
- Principles, informal statements, axioms, postulates
- Fundamental definitions: equal segments, midpoint, trisection
- Angles:
 - Equal, bisector
 - Perigon
 - Straight angle, adjacent, right, perpendicular lines, acute, obtuse, reflex
 - Oblique
 - Complementary, supplementary, vertical
 - Measuring angles; degrees, minutes, seconds; protractor; compass
- Triangle:
 - Defined, vertices, base, exterior angle
 - Opposite interior angle, median
 - Altitude, scalene, isosceles, equilateral, acute, obtuse, right, equiangular, sum of angles
- Polygon:
 - Defined
 - Base, adjacent sides, diagonal, convex, concave, sum of angles, regular, center
- Circle:
 - Defined, center, circumference, diameter, radius
 - Chord, arc, semicircle, quadrant
- Congruence:
 - Defined
 - Corresponding parts
- Constructions:
 - Perpendicular bisector, angle bisector, angle
 - Perpendicular at a point
 - Perpendicular from a point
 - Triangle given three sides, one side and adjacent angles, two sides and included angle

➤ Optical illusions, deduction

- Euclid's *Elements*

➤ Numeric applications

Rectilinear Plane Figures

- Demonstrative proof: defined, demonstrated, given, prove, analysis, proof, theorem, corollary
- Triangles congruent by:
 - SAS
 - LL
 - ASA
 - LA
 - SSS
 - HA, SAA, HL
- Triangle sides-angles relationships:
 - Isosceles triangle, equilateral, equiangular
 - Exterior-exterior angle, opposite sides-angles
- Auxiliary lines, direct and indirect method of proof
- Parallel lines
- Parallel postulate and corollary
- Transversal formed
- Angles formed, angle relationships
- Proving lines parallel
- Proving angles equal, supplementary, complementary
- Triangle relationships:
 - Sum of angles
 - Exterior-opposite interior angles
 - Acute angles of right triangle
 - 30°-60°-90°
- Unequal lines and angles, perpendicular lines, triangles with unequal lines and angles
 - Distance defined between two points, two lines, a line and a point
- Parallelograms and quadrilaterals:
 - Defined, base, altitude, rhombus, rectangle, square

MATHEMATICS: *Plane Geometry* cont.

Rectilinear Plane Figures cont.

- Relationships of sides, angles, diagonals, shapes formed
- Proving a quadrilateral is a parallelogram
- Segments intersected by parallel lines
- Trapezoid:
 - Defined, legs
 - Median
 - Altitude
 - Isosceles
- Polygons:
 - Defined
 - Sum of exterior angles, sum of interior angles
 - Each angle measure, formulas
- Concurrent lines of a triangle:
 - Defined, altitudes
 - Angle bisectors, perpendicular bisectors of sides, medians
- Proof reasoning methods (critical thinking skills): analytic, synthetic, general method
- Inequality axioms
- Numeric applications

The Circle

- Relationships of equal arcs, central angles, and chords; unequal arcs, central angles, and chords; chord distances from center
- Diameter–chord relationships, perpendicular relationships
- Inscribed and circumscribed polygons
- Tangent lines and relationships, common tangents
- Tangent and intersecting circles, common chord, concentric circles
- Measuring angles and arcs, inscribed angles, semicircles
- Angles formed by combinations of chords, tangents, secants
- Constructions and proofs:
 - Reviewed
 - Bisect arc
 - Parallel lines
 - Divide a line into n equal parts
 - Circumscribe a circle, inscribe a circle, tangent to a circle
 - Circle from various givens, triangle from various givens
- Locus:
 - Definitions and drawings
 - Fundamental locus theorems:
 - Equidistant and given distances from various points
 - Intersecting and parallel lines
 - Centers of circles tangent to a line, etc.
 - Intersecting loci
- General directions for constructions

Proportions & Similar Polygons

- Definitions: ratio, antecedent, consequent, proportion, extremes, means
- Fourth proportional
- Mean proportional
- Third proportional, continued proportion
- Fundamental properties: product of means and extremes, writing proportions
- Like-powers axioms
- Finding a mean proportional

- Transformations: alternation, inversion, addition, subtraction, like powers
- Proportional segments: by parallel lines, by angle bisectors
 - Similar polygons, corresponding sides
 - Corresponding angles, ratio of similitude
- Proving triangles similar aaa , aa , sas , ll , sss
- Proportional line proofs: in triangles, with parallel lines, in right triangles, in circles
- Pythagorean theorem proved
 - Similar polygons:
 - Proportional sides, perimeters, diagonals, corresponding lengths
 - Similarity of corresponding triangles
- Construction of proportional segments and polygons: fourth proportional, a given proportional, mean proportional
- Projection
 - Numeric applications

Surface Measurement

- Defined, equal figures, constant, variable
- Limit
 - Area mensuration formulas for rectangle, square, parallelogram, triangle, trapezoid
- Area proportions for rectangle, square, parallelogram, triangle, trapezoid
- Areas of similar triangles and similar polygons
 - Pythagorean theorem:
 - By areas of squares, by area of similar polygons
- Construction of equal non-similar shapes
- Transforming plane figures
- Numeric applications

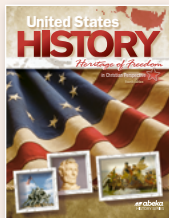
Regular Polygons & Circles

- Defined
- Inscribed and circumscribed, chords, tangents, midpoints
- Inscribed and circumscribed circles
- Angle at center of n -gon
- Ratios regarding similar polygons: perimeters, corresponding sides, areas, radii, apothems
- Area formula
- Circle proportions
- Formulas to measure:
 - Circumferences, radii, diameters
 - Pi
 - Arc length using angles in degrees
 - Sectors, segments, similar sectors and segments
- Constructions: inscribing a square, regular polygons
- Numeric applications including 30° – 60° – 90° , 45° – 45° – 90°

Trigonometry

- Defined
- Graphic solutions
 - Right triangle solutions
 - Sine, cosine, tangent, ratios, functions of angles in degrees
 - Interpolation, angles of elevation and depression
- Numeric applications

HISTORY & GEOGRAPHY: *U.S. History*



United States History: Heritage of Freedom provides a positive, narrative approach to American history that is reinforced by factual accounts of events, people, and ideas essential in shaping the success of America today. Special emphasis is placed on America's Christian heritage and patriotic pursuit of freedom, helping students identify the values that are the foundation of the United States of America.

Added Enrichment

- Special feature boxes
 - Emphasize the foundation of U.S. history
 - Highlight great influential Americans
 - Give facts about American symbols, details of historical events, and government concepts for a better understanding of U.S. history
- Thought-provoking questions about the information read in the text
- Important U.S. documents: The Declaration of Independence, Preamble to the Constitution, Lincoln's Gettysburg Address, and *The Federalist* No. 10 and No. 51
- Lists: U.S. presidents, states and capitals
- Maps correlating to text

Evaluation

- Reading quizzes
- Review quizzes (including memorization quizzes over Preamble to Constitution, Gettysburg Address, states and capitals, and U.S. presidents)
- Editorials (each counts as a quiz grade)
- Two projects: essay on *The Federalist* papers and critical book review
- Tests, quarter exams
- Semester exam, final exam

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Land of New Beginnings

- Discovery and Exploration
 - The providence of God
 - Tribes and civilizations of North America
 - The Renaissance, Protestant Reformation
 - Portuguese, Spanish, and French Exploration
 - New France sparsely populated
- The Thirteen Original Colonies
 - English spiritual and political heritage, English exploration
 - Sir Martin Frobisher and the "Northwest Passage"
 - Religious, political, economic reasons for colonization
 - Settling Jamestown, Plymouth, and the Thirteen Colonies
- Life in Colonial America
 - Diversity:
 - Immigration, churches, governments
 - Social classes
 - The livelihood of the colonies
 - Advances of learning
 - Harvard College, Old Deluder Satan Act, *The New England Primer*
 - Newspapers
 - Important political precedents

Birth of a Nation

- Preparation for Independence
 - The Great Awakening
 - French and Indian War
 - Anglo-French conflicts
 - English and French advantages
 - Battle of Quebec
 - Fundamental differences between the colonists and the British
- Conflict with Great Britain
 - British regulations on the colonists and colonial reaction
 - Navigation Acts and regulations on Industry

- Effects of the French and Indian War
- Colonists form a united front
- Lexington, Concord, and Bunker Hill
- The War for Independence
 - American attempts at reconciliation and the British refusal
 - Thomas Paine's *Common Sense*
 - Declaration of Independence
 - Influence of John Locke and William Blackstone
 - Patriot disadvantages
 - People: St. Leger, Herkimer, Wayne, Rochambeau
 - Battle of Oriskany
 - Treaty of Paris
- The Critical Period and the Constitution
 - Articles of Confederation
 - Understanding the weaknesses
 - Mount Vernon, Annapolis, and the Constitutional Conventions
 - Jonathan Dayton
 - William Paterson and the New Jersey Plan
 - Federalists and Anti-Federalists
 - How the Constitution works
 - Federal system and implied powers
 - Religious freedom on the state and federal levels
 - Alexis de Tocqueville
 - Isaac Backus and John Leland
- The Federalist Era
 - President George Washington: Judiciary Act of 1789
 - Hamilton's financial program
 - Loose and strict construction
 - Mint Act of 1792
 - Federalists and Democratic Republicans
 - French Revolution
 - President John Adams: Department of the Navy
 - President Thomas Jefferson: Twelfth Amendment and the Judiciary Act of 1801

HISTORY & GEOGRAPHY: U.S. History cont.

A Growing Nation

- The Age of Jefferson
 - *Marbury v. Madison*, Aaron Burr
 - Louisiana Purchase and its exploration
 - Tripolitan War
 - President James Madison
 - War of 1812
 - Responsibilities of freedom
 - Non-Intercourse Act
 - Fighting in Canada
 - Benefits of the War of 1812
 - Dolley Madison
- The Nationalist Era
 - President James Monroe and the Monroe Doctrine
 - Panic of 1819
 - John Marshall's Supreme Court
 - Westward expansion and the Missouri Compromise
 - Bonus Bill and American System
 - Rush-Bagot Agreement
 - President John Quincy Adams and the "favorite sons" election
 - Rising sectionalism and party politics
- The Age of Jackson
 - President Andrew Jackson
 - Webster-Hayne debate, tariffs, nullification, and the Force Bill
 - Native American relocation
 - National Bank
 - President Martin Van Buren: Panic of 1837, suffrage, and the Whig Party
 - President William Henry Harrison
 - President John Tyler
 - Aroostook War

The American Character

- Revival and Missions
 - Second Great Awakening
 - Richard Allen
 - Foreign and domestic missions outreach
 - Reform movements: abolition, temperance, and suffrage
 - Challenges to Christianity: Unitarianism and transcendentalism
- Education, Technology, and Culture
 - American textbooks: "Blue-Backed Speller" and the *Eclectic Readers*
 - Public education: Horace Mann's normal schools and traditional education
 - Agricultural and industrial advancements
 - Samuel Slater, James Watt, and Oliver Evans
 - Improved transportation and communication
 - John Loudon McAdam
 - New social classes
 - Development of American Culture
 - Romantic era and Fireside Poets
 - Stephen Foster
- Expansion to the Pacific
 - Manifest Destiny
 - Texas War for Independence
 - Oregon Territory: Jason Lee, Whitmans, and Spaldings
 - President James K. Polk
 - Mexican War
 - Annexation of Texas and the California Gold Rush
 - John Slidell

Expansion and Conflict

- Slavery and Secession
 - Abolition movement
 - Wilmot Proviso and the Compromise of 1850
 - President Zachary Taylor
 - Seventh of March Speech
 - President Millard Fillmore
 - President Franklin Pierce
 - Kansas-Nebraska Act
 - Republican Party
 - President James Buchanan
 - *Dred Scott v. Sanford*
 - Lincoln-Douglas debates
 - Freeport Doctrine
 - President Abraham Lincoln
 - South Carolina secedes
- The Civil War
 - Northern and Southern reasons for fighting
 - Key battles
 - Ft. Sumter, Vicksburg, Antietam Creek, Fredericksburg, Chancellorsville, Gettysburg, and Wilderness Campaign
 - War in the West
 - Emancipation Proclamation
 - Gettysburg Address
 - Confederate surrender at Appomattox Court House
 - Financing the war: Trent Affair and USS *Alabama* Dispute
 - Christianity and the Civil War
 - John William Jones, Oliver O. Howard, Samuel Chapman Armstrong, and William Nelson Pendleton
- Reconstruction
 - Lincoln's Reconstruction plan
 - Wade-Davis Bill
 - President Andrew Johnson
 - Civil War amendments and Reconstruction acts
 - Johnson impeached
 - Tenure of Office Act
 - President Ulysses S. Grant
 - President Rutherford B. Hayes: Election of 1876 and Compromise of 1877
 - Tuskegee Institute: Booker T. Washington and George Washington Carver

Age of Progress

- Age of Industry
 - Agricultural progress
 - Luther Burbank and new legislation
 - Great Age of Enterprise
 - Thomas Edison and Nikola Tesla
 - Factors of America's prosperity
 - Big business organizations
 - Politics in the Age of Industry
 - Labor unions
 - Trouble on the farm: Greenback Labor Party, the Free Silver Movement, and the Populist Party
 - Expanding influence of Christianity
- The Gilded Age
 - Life in the Gilded Age
 - Immigration
 - Chinese Exclusion Act

HISTORY & GEOGRAPHY: U.S. History *cont.*

Age of Progress *cont.*

- William Speer
 - New Immigration
- New opportunities for women
- Emergence of the modern city and the improvement of daily life
- Growing Christian influence
- Education and social reform
 - Morrill Act and the Chautauqua Movement
 - Temperance Movement: Frances Willard
- Literature, art, and music in the late 19th century
- Men in the White House
 - Black Friday
 - Presidential Succession Act and Electoral Count Act
- America's Expanding Influence
 - Transcontinental railroad
 - James J. Hill and Jay Gould
 - Settling the West
 - Mining, cattle herding, and farming
 - Oklahoma Land Rush
 - Plains Indians
 - Indian Wars
 - Wovoka
 - Helen Hunt Jackson and the Indian Reorganization Act
 - New outlying possessions
 - Alaska, Hawaii, and the Samoan Islands
 - Relations with foreign countries
 - England and the Treaty of Washington
 - Latin America and the organization of American States
 - Spanish-American War
 - Advancing freedom and civilization in the Philippines, Cuba, Puerto Rico, and Guam
 - Foraker Act

A New Century

- The Progressive Era
 - Advances in technology, transportation, and communication
 - President Theodore Roosevelt
 - Business and labor: Antitrust laws and Panic of 1907
 - Natural resources: Gifford Pinchot
 - Foreign affairs: Hay–Bunau–Varilla Treaty
 - President William Taft
 - Payne–Aldrich Bill
 - Progressive Party
 - President Woodrow Wilson
 - Federal Reserve Act
 - Pancho Villa
 - State and local government changes
 - Joseph G. Cannon, recall, presidential primary
- World War I
 - Steps toward war and beginning of war
 - United States' involvement
 - Sussex pledge, National Defense Act, Selective Service Act
 - Wilson's Fourteen Points, League of Nations, and Treaty of Versailles
 - Henry Cabot Lodge
- Roaring Twenties
 - Postwar unrest
 - Communist threats: Sacco–Vanzetti Case
 - Washington Conference

- Fordney–McCumber Tariff
 - Dawes Plan and Young Plan
- McNary–Haugen Bill
 - Liberalism: social gospel and new thought patterns
 - Darwinism and the Scopes Monkey Trial
 - Results of the Scopes Monkey Trial
 - Fundamentalists, Christian scholars, and evangelism
- Depression and the New Deal
 - President Herbert Hoover
 - Causes of the Great Depression
 - Success of private relief versus government intervention
 - Foreign affairs: Smoot–Hawley Tariff
 - American culture in the Depression
 - President Franklin Roosevelt and the New Deal
 - Relief, recovery, and reform
 - Repeal of prohibition
 - The inefficiency of and dangerous precedents set by the New Deal

The Global Age

- World War II
 - The Road to War
 - Disarmament failures and religious unbelief
 - Geneva Disarmament Conference
 - Rising dictatorships
 - Unchecked aggression and failure of the Munich Pact
 - American involvement
 - America First Committee
 - Lend–Lease Act and Pearl Harbor
 - Executive Order 9066
 - European and Pacific Theaters: D-Day, Doolittle's Raid, V-E Day, and V-J Day
 - Manhattan Project
 - Holocaust
 - Formation of the United Nations
 - Domestic Policies in the Cold War
 - President Harry Truman
 - Fair Deal
 - GI Bill of Rights and Internal Security Act
 - Communist subversion and McCarthy trials
 - President Dwight Eisenhower
 - Atomic Energy Act
 - *Brown v. Board of Education of Topeka*
 - Presidents Kennedy and Johnson
 - New Frontier and the Great Society
 - Civil Rights Act of 1964, Voting Rights Act of 1965, and the Fair Housing Act of 1968
 - Post–World War II Amendments
 - Presidents Nixon, Ford, and Carter
 - Watergate Scandal
 - Three Mile Island
 - Foreign Policies in the Cold War
 - Post–World War II
 - Cold War: "Iron Curtain", Truman Doctrine, Marshall Plan, NATO
 - Europe
 - Berlin Airlift, Geneva Summit, Berlin Wall
 - SALT I and II
- Henry Kissinger

HISTORY & GEOGRAPHY: U.S. History *cont.*

The Global Age *cont.*

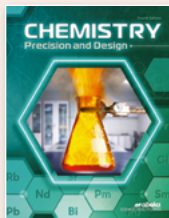
- Asia
 - Japanese Peace Treaty Conference
 - Korean War: failure of containment
 - Vietnam War
 - Tet Offensive, **My Lai Massacre**
 - The fall of Saigon
- Latin America and Africa
 - Communist Cuba: Bay of Pigs and Cuban Missile Crisis
- Middle East
 - Eisenhower Doctrine
 - Yom Kippur War and OPEC
 - **Lebanon Crisis**
 - Camp David Peace Accords
 - Iran hostage crisis
- Daily Life in the Cold War
 - Technological advancements
 - Space Race: Sputnik and NASA
 - Moon landing
 - Telecommunication, television, computers, and satellites
 - Age of the Automobile
 - Social movements
 - Civil rights: Martin Luther King Jr., Rosa Parks, and the SCLC
 - Vietnam War protests, Communist sympathizers
 - *Roe v. Wade*
 - Cultural Revolution
 - Daily life
 - Evolution of family life
 - Entertainment
 - **Christianity in the Cold War**
- The Eve of the New Millennium
 - The Reagan Era
 - Moral Majority, "Reaganomics", and the Reagan Doctrine
 - The Bush administration
 - Foreign policy: Tiananmen Square, Manuel Noriega, and Nelson Mandela and apartheid

- Collapse of the Soviet Union, fall of the Berlin Wall
- Persian Gulf War
- Clinton's presidency
 - NAFTA and the PLO
 - **Newt Gingrich and the "Contract with America"**
 - **Budget debate**
- Technology and Culture in the 1990s
 - Information Age
 - Culture and corruption
- America in the New Millennium
 - The Bush administration
 - 9/11 attack
 - **USA PATRIOT Act**
 - Bush Doctrine
 - Operation Enduring Freedom and Iraqi Freedom
 - **Neoconservatism**
 - The Obama administration
 - Stimulus and the Affordable Care Act
 - **Death of Osama bin Laden and the rise of ISIS**
 - **Benghazi Scandal**
 - **The Trump administration**
 - Confirmation of Neil Gorsuch and Brett Kavanaugh
 - United States–Mexico–Canada Agreement
 - Singapore Summit and the Jerusalem Embassy Act
 - **American moral decline**
 - Postmodernism
 - *Obergefell v. Hodges*
 - Euthanasia
 - Las Vegas Shooting
 - **Science and culture in the New Millennium**

Prayer Time

- Learn to pray for our nation and for government officials

SCIENCE: Chemistry



Chemistry: Precision and Design explores the many branches of chemistry to discover the ingenious structure and orderly function of God's creation. The Christian perspective of this text rejects evolution and recognizes special creation as the reasonable explanation for the origin and design of the universe. Although chemistry has been less permeated by evolutionary doctrine than biology or geology, one's view of origins does affect how he approaches the science of chemistry and how he applies chemical principles to societal issues.

Chemistry: Precision and Design recognizes God's command for man to have dominion over the creation, and its goal is to teach how man might extend his "dominion" and make wiser use of the physical creation. This text presents chemistry as a foundational science and includes chapters on nuclear and organic chemistry. It seeks not only to give students a solid basis in chemical principles but also to help students understand the practical application of these principles.

Added Enrichment

- Feature boxes include:
 - Additional information on topics of interest
 - Chemistry in everyday objects
 - Highlights of God's design in the chemistry of His creation
 - Innovations in chemistry
 - Chemical explanations of environmental issues
- Practice exercises (61), critical thinking questions (168)
- Laboratory exercises (27)

Evaluation

- Reading quizzes (23)
- Review quizzes (31)
- STEM Project (counts as 6 quiz grades and 1 test grade)
- Tests (8), quarter exams (2)
- Semester exam, final exam

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

Chemistry: An Introduction

- Branches of chemistry, importance of chemistry
- Process of science:
 - Scientific investigation, hypotheses, designing an experiment, laws and theories
 - Causality, models in science
 - Scientific ethics
 - Limitations and purpose of science
 - Engineering design
- Measurement and mathematics in chemistry:
 - Precision and accuracy, uncertainty
 - F.P.S. and SI units
 - Prefixes, measuring length, volume, mass, density, temperature, and other quantities
 - Unit conversion
 - Scientific notation:
 - Calculations
 - Significant digits in measurement and calculation
 - Problem-solving strategies

Matter

- States of matter, melting and boiling points
- Classification:
 - Atoms, molecules
 - Elements, compounds, pure substances, mixtures:
 - Relative abundance of elements
 - Homogeneous and heterogeneous matter
- John Dalton and atomic theory:
 - Laws derived from atomic theory
- Properties and changes of matter:
 - Properties of matter
 - Physical and chemical changes
 - Separation of mixtures
- Subatomic particles:
 - Discovery of the electron, proton, and neutron
- Atomic number, mass number, isotopes, and ions

- Atomic mass:
 - Atomic mass units
 - Mass spectrometer, mass spectrum
 - Calculating atomic mass, weighted averages

Elements and Compounds

- Formulas and names: types of chemical formulas, naming binary molecular compounds
- Naming ionic compounds: memorizing names of ions, determining empirical formulas
 - Hydrate names and formulas
- The mole:
 - Formula masses, mole
 - Avogadro's number, molar mass
 - Empirical formulas from percent composition

Chemical Reactions

- Balancing chemical equations:
 - Equations, reactants, products, law of conservation of mass
 - Steps for balancing equations
- Classification of chemical reactions:
 - Combination (synthesis), decomposition, single-displacement (substitution), and double-displacement reactions
 - Predicting products of reactions
- Quantitative relationships from the balanced equation:
 - Mole relationships
 - Limiting reactant, mass relationships in chemical reactions

Gases

- Kinetic-molecular theory:
 - Five assumptions of kinetic-molecular theory
 - Ideal gas
- Gas pressure:
 - Pressure, barometer
 - Manometers
- The gas laws:
 - Boyle's law, Charles's law, combined gas law

SCIENCE: Chemistry *cont.***Gases** *cont.*

- STP, Gay-Lussac's law
- Avogadro's law, molar volume, ideal gas law
- Diffusion, partial pressures, and stoichiometry:
 - Diffusion
 - Rates of diffusion, Graham's law, partial pressure
 - Dalton's law of partial pressures, stoichiometry and gases

Chemical Thermodynamics

- Energy:
 - Kinetic and potential energy
 - System, surroundings
 - Internal energy
 - First law of thermodynamics:
 - Mathematical statement
- Heat in chemical reactions:
 - Enthalpy
 - Endothermic and exothermic reactions
 - Enthalpy of reaction, thermochemical equation
 - Standard state, enthalpy of formation, Hess's law, mass-heat calculations
- Calorimetry
- Heat and changes of state:
 - Enthalpy of fusion, Enthalpy of vaporization
 - Vapor pressure:
 - Vapor pressure of liquids, critical point
 - Vapor pressure of solids, phase diagrams
- Entropy:
 - Second law of thermodynamics, spontaneity
 - Gibbs free energy

Light, Electrons & Atomic Structure

- Nature of light:
 - Properties of waves: crest, trough, wavelength, amplitude, frequency, speed
 - Classical theories of light, electromagnetic wave, speed of light, electromagnetic spectrum, quantum theory of light
 - Photon, wave-particle duality
 - Photon energy-frequency relationship
- Electrons and the structure of the atom:
 - Spectrometer, line spectra, continuous spectra
 - Hydrogen spectrum
 - Introductory quantitative treatment of Bohr model, details of energy levels, ground state, excited state, quantized, matter waves
 - Schrödinger equation
 - Uncertainty principle
 - Detailed description of electron-cloud model
- Electron configuration and quantum numbers:
 - Probability contours, orbital shapes
 - Electron configuration
 - Four quantum numbers, Pauli exclusion principle
 - Aufbau principle, Hund's rule
 - Valence electrons
 - Lewis structures of atoms

Periodic Table

- Historical development of the periodic table:
 - Döbereiner's triads, Newland's octaves
 - Periodic law
 - Mendeleev's table
- Classification of the elements:

- Group, period
- Nonmetals, metals, semimetals, main-group elements, transition and inner transition metals
- Brief description of several groups (alkali metals, etc.)
- Periodicity of chemical properties: periodic properties of elements in the alkali and alkaline earth metals, valence
- Electron configurations and the periodic table: correlations between the two. Madelung rule
- Periodic properties of the elements: atomic size, ionic size, ionization energy, metallic character, electron affinity, electronegativity

The Chemical Bond & Intermolecular Forces

- Octet rule
- Covalent bonds:
 - Explanation of covalent bonds, bonding and nonbonding electrons
 - Single, double, and triple bonds
 - Covalent networks
 - Lewis structures, delocalized electrons
 - Resonance structures
 - Polar and nonpolar bonds, dipoles
 - Molecular shape: VSEPR, effect of shape on molecule polarity
 - Hybridization: sigma and pi bonds
- Explanation of ionic bonding, crystalline solids
- Metallic bonding
- Predicting bond character
- Intermolecular forces: dipole-dipole, London forces, hydrogen bonds
- Crystals: amorphous and crystalline solids:
 - Types of unit cells, close packing

Selected Nonmetals & Their Compounds

- Hydrogen: most abundant element in universe, properties, preparation, reactions, and uses
- Nitrogen: occurrence, properties, preparation, reactions, and uses
- Phosphorus: occurrence, properties, preparation, reactions, and uses
- Oxygen: occurrence, properties, preparation, reactions, and uses, hydrogen peroxide, free radicals
- Sulfur: occurrence, properties, preparation, reactions, and uses
- Halogens:
 - Occurrence, properties, preparation, reactions, and uses of stable halogens
- Noble gases:
 - Occurrence, properties, compounds, and uses

Selected Metals & Semimetals

- Metallurgy:
 - Ore
 - Processing ore
- Main-group metals:
 - Alkali metals:
 - Occurrence, properties, preparation, and uses; alkali metal compounds
 - Alkaline earth metals:
 - Occurrence, properties, preparation, and uses
 - Aluminum:
 - Occurrence, properties, preparation, and uses; thermite process
 - Lead
- Transition and inner transition metals:
 - Iron:
 - Occurrence
 - Properties, production, steel refining, annealing, hardening, and tempering

SCIENCE: Chemistry *cont.***Selected Metals & Semimetals** *cont.*

- Copper:
 - Occurrence, properties, preparation, and uses
- Precious metals:
 - Occurrence, properties, preparation, and uses
- Titanium, uranium
- Important semimetals and their compounds:
 - Silicon and germanium:
 - Occurrence, properties, preparation, and uses
 - Semiconducting properties
 - Silicates, glass, silicones
 - Boron

Solutions & Colloids

- Introduction to solutions:
 - Solution, solvent, solute
 - Miscible and immiscible
 - Hydrated, solvated, ionization
 - Factors affecting solution rates
 - Solubility rules
- Behavior of solutions:
 - Crystallization, dynamic equilibrium
 - Solubility
 - Saturated
 - Unsaturated, supersaturated
 - Effect of temperature
 - Effect of pressure on solubility; enthalpy of solution
- Measuring solution concentration:
 - Generic concentration expression, dilution
 - Amount concentration, molality
 - Mass fraction
- Colligative properties:
 - Vapor pressure:
 - Effects of solute
 - Vapor pressure and changes of state
 - Quantitative treatment of boiling point elevation and freezing point depression
 - Electrolytes and colligative properties
 - Osmotic pressure
- Reactions in aqueous solutions:
 - Classifying aqueous reactions:
 - Precipitation, acid-base, and redox reactions
 - Predicting products of precipitation reactions
 - Stoichiometry of solution reactions
- Colloids and suspensions:
 - Tyndall effect, Brownian motion
 - Types of colloids
 - Suspensions

Chemical Kinetics

- Introduction to chemical kinetics: reaction rate, collision theory
 - Activation energy
- Concentration, temperature, and reaction rate:
 - Quantitative treatment
- Transition states and energy changes:
 - Transition-state theory, activated complex
 - Potential energy in endothermic and exothermic reactions

- Effects of a catalyst:
 - Alternate pathway with lower activation energy
 - Energy changes in catalyzed reactions, types of catalysts
 - Enzymes:
 - Inhibitors
- Reaction mechanisms: elementary reactions, chain mechanisms, rate laws, method of initial rates

Chemical Equilibrium

- Reversible reactions:
 - Chemical equilibrium
 - Equilibrium concentrations
- Le Chatelier's Principle:
 - Concentration changes, pressure changes
 - Temperature changes, effects of a catalyst
- Equilibrium constants, solubility product constants, common ion effect

Acids, Bases & Salts

- Nature of acids and bases:
 - Characteristics of acids and bases
 - Arrhenius concept, Brønsted-Lowry concept
 - Conjugate acids and bases, naming acids and bases
 - Polyprotic acids, acidic and basic anhydrides
- Strengths of acids and bases: strong and weak acids and bases
- Acids in chemical reactions:
 - Net ionic equations
 - Reactions with bases—neutralization, salts
 - Reactions with carbonates, bicarbonates, and metals; activity series
- Equivalence concept: equivalent, equivalent concentration
- pH:
 - Ionization of water
 - Calculating pH with logarithms, pOH scale, pH measurement
 - Acid-base indicators
- Acid-base titrations: titration, equivalence point, end point
- Hydrolysis and buffers: acidic and basic salts, characteristics of buffers

Oxidation-Reduction Reactions & Electrochemistry

- Redox reactions:
 - Oxidizing and reducing agents
 - Oxidation numbers
 - Balancing redox reactions
 - Strength of oxidizing and reducing agents: activity series
- Electrochemical reactions:
 - Electric current, electrolyte, anode, cathode
 - Electrolysis:
 - Molten sodium chloride
 - Water, aqueous salt solution
 - Electroplating
 - Voltaic cells:
 - Construction, salt bridge
 - Sign conventions of anodes and cathodes
 - Cell voltage: measuring electrode potentials, standard reduction potentials

SCIENCE: Chemistry *cont.*

Nuclear Chemistry

- Radioactivity:
 - Changes in the nucleus—discovery
 - Nuclides
 - Radiation, radioactivity, types of radioactivity
- Nuclear stability:
 - Density of the nucleus
 - Strong nuclear force
 - Radioactive decay
 - Nuclear mass defect, nuclear binding energy, electron volt, binding energy per nucleon
- Nuclear reactions:
 - Details of alpha, beta, and gamma decay; positron emission; neutron radiation
 - Penetration ability
 - Half-life
 - Activity, units of measurement
 - Radioactive decay series, bombardment reactions
 - Radiometric dating
 - Particle accelerators, transuranium elements
- Effects of radiation on matter:
 - Ionizing radiation, effects on living tissue
 - Detecting radiation, measuring radiation
 - Health effects, sources of exposure
- Nuclear fission and fusion:
 - Discovery
 - Details of chain reaction
 - Critical mass
 - Atomic bomb
 - Nuclear reactor:
 - Enrichment
 - Safety
 - Waste, breeder reactor
 - Chemistry of nuclear fusion, confinement methods

Organic Chemistry

- Introduction to organic chemistry: carbon bonding, isomer, structural formula, functional group
- Hydrocarbons:
 - Detailed overview of alkanes, alkenes, alkynes, aromatic hydrocarbons: structure, nomenclature, and reactions
 - Saturated and unsaturated, alkyl groups
 - Sources of hydrocarbons
- Substituted hydrocarbons:
 - Alcohols, carboxylic acids, esters:
 - Nomenclature, reactions
 - Aldehydes and ketones, amines, amides
 - Other substituted hydrocarbons:
 - Haloalkanes
 - Epoxides, thiols
- Polymer chemistry:
 - Monomer, polymerization
 - Polymers by chemical structure:
 - Polyethylene, vinyls, polyesters, polyamides (nylon), polycarbonate, silicones
 - Biological polymers:
 - Protein, cellulose, chitin, and DNA
- Biochemistry:
 - Proteins and amino acids, peptide bonds
 - Carbohydrates, sugars, mono-, di-, and polysaccharides
 - Pentose, hexose, chain and ring forms, stereoisomers
 - Fats, lipids, fatty acids, oils:
 - Saturated and unsaturated:
 - Chemical structure of *trans* fats
 - Soaps and detergents:
 - Saponification
 - Phospholipids, steroids, cholesterol:
 - Chemical structure
 - Nucleic acids:
 - DNA, RNA
 - 3' and 5' ends, factors affecting base pairing
 - Codon, gene, transcription, translation
 - Metabolism:
 - Cellular respiration, fermentation, photosynthesis
 - Catabolism, anabolism

BIBLE: *Jesus & His Followers* (one semester)



Jesus and His Followers traces the life of Christ from His arrival as a Babe in Bethlehem, through His death on the cross at Calvary, to His ascension into heaven. This practical, personal study of the gospels is designed to reach both the head and the heart of the student. Through the teachings of Jesus and the example He set for His followers, the student learns how to live a more abundant and fruitful Christian life. Practical applications and thought-provoking questions encourages the student to examine his walk with Christ and apply God's Word to his life. Memory passages have been selected to correlate with the topics discussed to help the student become grounded in the Scriptures.

Evaluation

- Verses:
 - Verse quizzes (16)
 - 9-weeks verses exam (1)
 - Final verses exam (1)
- Content:
 - Unit quizzes (8)
 - 9-weeks content exam (1)
 - Final content exam (1)

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

Lessons 72

- The Bible—God communicates with us:
 - How our English Bible came to us
 - The English Bible in the 20th Century
 - Four portraits of Christ in the Gospels
- Jesus' birth and preparation for ministry:
 - The first Christmas
 - In the Temple at age twelve
 - Jesus is baptized:
 - The trinity of God
 - The purpose of water baptism
 - Salvation is a prerequisite
 - Jesus is tempted:
 - The background of the tempter
 - The essence of temptation
- Jesus' early ministry:
 - Miracle at the wedding in Cana:
 - What Scripture says about alcohol
 - Drugs—a blessing or a curse?
 - Jesus cleanses the Temple:
 - The Spirit of God dwelling in the believer
 - New birth and the new nature
 - Samaritan woman at the well
- His popular ministry in Galilee:
 - Jesus heals and forgives sin:
 - Causes of sickness
 - Ten lepers and Jairus's daughter:
 - Promises for answered prayer
 - Feeding the multitude
 - Jesus walks on water and offers living Bread
 - Jesus meets with opposition
 - Jesus meets demonic activity
- The Master Teacher:
 - Jesus teaches through parables
 - Jesus calls the disciples and chooses apostles
 - Jesus teaches His followers to pay taxes
 - Jesus reveals what hell is like

- Various Encounters: The Sabbath encounter
 - Christ encounters the hypocritical Pharisees
- Mount of Transfiguration:
 - Two ways to increase faith
- Encounters with a young ruler and Zacchaeus
- Widow's Son and Lazarus
- The Passion Week:
 - Triumphal entry
 - Passover supper and Garden of Gethsemane:
 - Paul instructs the church about the Lord's table
 - Jesus speaks to the eleven:
 - The vine and the branches
 - Persecution inevitably awaits His followers
 - Jesus' prayer for His disciples
 - Jesus' trial and crucifixion
- Resurrection: Post-resurrection appearances
- Ascension
- Sermon on the Mount:
 - The Beatitudes produce "overflowing joy"
 - Disciples called to be "salt" and "light"
 - Guidelines for giving and praying
 - The Lord's Prayer—an outline for prayer
 - Guidelines to combat materialism
 - Practical points to avoid pitfalls

Music 51 songs

- Hymns, gospel songs, holiday songs

Memory Work

- Passages (16 containing 48 verses)

Prayer Time

- Learn to pray for others, missions, our nation, those in authority over us. Include praise and thanksgiving to God.

BIBLE: *Life Management* (one semester)



The successful Christian life is a life under biblical management. *Life Management under God* is an application of biblical principles in practical areas of life. Each lesson provides a marvelous opportunity to apply God's truth to everyday problems and situations. Great effort has been taken to also include critical topics from a scriptural point of view. This study can help each student obtain success by instructing him on how to apply the Word of God, life's greatest certainty, to his own life.

Evaluation

- Verses:
 - Verse quizzes (17)
 - 9-weeks verses exam (1)
 - Final verses exam (1)
- Content:
 - Unit quizzes (7)
 - 9-weeks content exam (1)
 - Final content exam (1)

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

Lessons 70

- How to relate to others:
 - Being a friend
 - Relationships with the opposite sex
 - Getting along with your family
 - Learning to forgive
 - Living courteously
- Your safety and well-being:
 - First aid
 - Alcohol and tobacco
 - Illegal drugs
- Developing balanced living habits:
 - Nutrition for optimum living
 - Exercise for vibrant living
 - Dealing with stress and fatigue
 - Promoting spiritual health
- Job success:
 - Part-time work and your life's work
 - How to get a job
 - How to get along with your boss and relate to your fellow workers

- Taking responsibility:
 - Time management for efficient living
 - Managing your money
 - Responsibilities of citizenship
- Preparing for marriage from a biblical perspective:
 - Falling in love
 - Living with your marriage partner
 - Looking at the issue of divorce
 - Fornication and adultery
 - Sexually transmitted diseases
- Issues that affect your life:
 - Creation versus evolution, abortion
 - Gambling, social networking

Music 44 songs

- Songs, holiday songs

Memory Work

- Passages (29 containing 72 verses)

Prayer Time

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