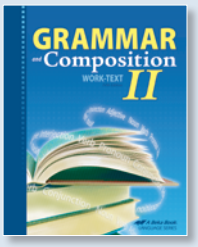
Grammar & Composition Grade 8



Two vital abilities, the ability to express one's ideas creatively as well as correctly and the ability to comprehend and interpret the written word skillfully, are built upon the elements which are included in English 8. *Grammar and Composition II* builds upon the skills learned in earlier grammar studies providing foundational practice of proper grammar and developing the basic composition skills used in outlining, summarizing, describing, researching, and letter-writing. Students will also be introduced to new grammar rules and new editing techniques that will allow them to expand their writing skills.

Added Enrichment

- English teaching transparencies
- Review games
- Grammar Court procedures explained

Evaluation

- Grammar quizzes (22)
- Tests (8), 9-weeks exam (2)
- Semester exam, final exam
- Compositions:
  - Book reports: full (2), oral (1)
  - Paragraphs (2), description (1)
  - Research paper (1)
- Optional (graded at teacher discretion):
  - Comparison, descriptions
  - Narratives (true, descriptive)
  - Newspaper articles, original poems
  - Paragraph, limerick, missionary letter
  - Short book reports, characteristic essay
  - Character sketches, journal entries
  - Essay answer

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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 and abbreviations
    - 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:
      - 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

Grammar & Composition cont.

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Grammar cont.

- 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
- ➤ 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
- 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
  - Diagraming subjects and verbs
  - Recognizing and diagraming compound subjects and verbs
  - Recognizing complements
  - Correcting fragments and run-on sentences
  - Sentence structure:
    - Defining dependent and independent clauses
    - Recognizing and diagraming simple, compound, complex, and compound-complex sentences
    - ➤ Recognizing noun clauses used as subjects of independent clauses
- Parts of speech:
  - Recognizing eight parts of speech
  - Verbs:
    - Recognizing action, linking, and helping verbs:
      - ➤ Action: transitive and intransitive verbs
    - Distinguishing verbs from verbals:
      - Participles
      - ➤ Gerunds and infinitives
    - Using:
      - Principal parts of verbs
      - Regular verb endings, irregular verbs
      - Correct principal parts
      - Verb tenses:
        - ➤ Using progressive and emphatic forms
        - Using consistent verb tense
      - ➤ Using active and passive voice
      - Avoid incorrect verb forms
      - Use troublesome verbs correctly and avoid verb usage errors
      - Use exact and vivid verbs:
        - ➤ Choosing exact verbs instead of verb-adverb combinations
  - Nouns:
    - Recognizing nouns: compound, common, proper, and collective
    - ➤ Gerunds
    - Keeping agreement of subject and verb:
      - ➤ Words ending in *-ics* as subjects may be singular or plural
    - Recognizing nouns as predicate nominatives, direct objects, indirect objects, objects of prepositions, direct address, and appositives
    - ➤ Gerund phrases
    - Diagraming nouns as predicate nominatives, direct objects, indirect objects, objects of prepositions, and appositives:
      - ➤ Diagraming:
        - Compound verb with separate direct objects
        - ➤ Compound verb with same direct object
        - ➤ Nouns as direct address
        - ➤ Gerund phrases
    - Using exact and vivid nouns
  - 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, appositives of subjects, and appositives of predicate nominatives
      - ➤ For appositives to subjects and appositives to predicate nominatives
    - Objective case:
      - For direct objects, indirect objects, and objects of prepositions and 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

Grammar & Composition cont.

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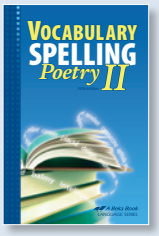
Grammar *cont.*

- Adjectives:
  - Recognizing and diagraming adjectives:
    - Participles and proper adjectives
    - ➤ Infinitives as adjectives
  - Distinguishing adjectives from nouns and pronouns
  - Recognizing and diagraming predicate adjectives:
    - Diagraming compound verbs with one predicate adjective and separate predicate adjectives
  - Using and diagraming:
    - 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:
    - ➤ Supplying necessary words in comparison
  - Using exact and vivid adjectives
- Adverbs:
  - Recognizing and digraming adverbs
  - ➤ Infinitives as adverbs
  - Distinguishing adverbs from adjectives
  - Using and diagraming:
    - Prepositional phrases as adverbs
    - ➤ Infinitive phrases as adverbs
    - Adverb clauses:
      - ➤ Elliptical clauses
  - Correct placement of adverb modifiers
  - ➤ Distinguishing dependent clauses
  - Using adverbs in comparison
  - Using exact and vivid adverbs
- 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

Composition

- Manuscript form: abbreviations, numbers, titles
- The library: Dewey Decimal System, Library of Congress Classification System, using the catalog and reference section
- Summaries (3)
- Book reports:
  - Preparing:
    - Written book reports including introduction, body, conclusion
    - Oral book reports: written preparation and oral presentation
- Outline (5):
  - Topical and sentence outlines
  - Format of outline
  - Parallelism in an outline
  - Steps to preparing an outline
- Introducing paragraphs (11):
  - Topic sentence
  - Summarizing sentence
  - Paragraph development:
    - Development by examples, incidents, and reasons
  - Paragraph unity
  - Paragraph coherence: chronological order, order of importance, transitional expressions, space order, pronoun reference, and repetition
- Writing descriptions about persons, places, and things (14):
  - Steps: point of view, careful selection of details, arrangement of details, use of exact nouns and verbs
- The Writing Process: plan, write, rewrite, edit
- Research paper:
  - Planning the paper: selecting subject, finding sources, 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
  - Preparing works cited page
  - Typing the paper
  - Documentation for research paper
- Improving writing style
  - Correct a choppy or monotonous style:
    - Begin sentence with an adverb, adverb phrase, adverb clause, or participial phrase
    - ➤ Begin sentence with an adjective, participle, prepositional phrase, or infinitive phrase

Vocabulary, Spelling, Poetry Grade 8



Vocabulary, Spelling, Poetry II emphasizes using an expanded vocabulary and applying spelling rules when analyzing challenging words. The goals of poetry memorization and recitation are an enjoyment and appreciation of poetic beauty and excellence.

Added Enrichment

- Spelling and vocabulary:
  - Spelling and vocabulary lists (32) including review list at end of each 9 weeks:
    - Spelling words (560)
    - Vocabulary words (280)
    - Organized by spelling rules, suffixes, homonyms, compound words, and commonly misspelled words
    - Practice exercises (68) including crossword puzzles
  - Review games
  - Each vocabulary word includes:
    - Pronunciation, part of speech
    - Definition, sample sentence
  - Pronunciation key
  - CD includes a reading of the vocabulary words and definitions and sample sentences
  - Teacher resource: vocabulary mastery sentences
- Poetry: CD included to help with interpretation

Evaluation

- Spelling and vocabulary quizzes:
  - Weekly (24)
  - 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 and vocabulary lists including:
  - ➤ Vocabulary words and definitions
  - ➤ Words that follow the spelling rules
  - ➤ Commonly misspelled words
  - ➤ Homonyms
- Use vocabulary words in sentences and 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:
  - Antonyms and synonyms of vocabulary words
  - To distinguish between homophones
  - Practical spelling tips and suggestions by studying Keys to Good Spelling
  - Spelling rules:
    - Use *i* before *e*, except after *c*, or when sounded like long *a*
    - Double a final consonant before adding a suffix beginning with a vowel
    - Change *y* to *i* when adding suffixes
    - Drop the silent *e* before adding a suffix beginning with a vowel
    - Learn exceptions to the spelling rules
    - Creating a compound word doesn't change the spelling of the two parts
    - Adding a prefix to a word doesn't change the word's spelling

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

Literature Grade 8

Of Places uses young people's interest in other places to teach Christian character traits such as compassion, courage, and understanding. Not only will students gain exposure to people of different ages, nationalities, races, cultures, and economic levels through a variety of literary selections, but they will also learn to enjoy reading wholesome literature. Many of the selections in *Of Places* were written by famous authors and are well-known classics that are an important part of a student's education. *Of Places* features excerpts from classics such as *Up from Slavery, The Jungle Book, Ben Hur,* and *The Legend of Sleepy Hollow.*

Literary Value

- 83 authors, including well-known writers such as Emily Dickinson, L. M. Montgomery, Carl Sandburg, and Booker T. Washington
- Prose selections (46), poems (48), and play (1)
- Character-building themes such as personal sacrifice, importance of family, admitting one's mistakes, and hard-work ethics

Added Enrichment

- Footnotes define and explain unfamiliar words
- Comprehension and discussion questions after selections
- Character-building quotations and verses
- Introductory paragraphs for interest and background information
- Review games

Evaluation

- Speed and comprehension quizzes (19)
- Homework reading quizzes (13)
- Tests (8), 9-weeks exam (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

› Recognize the different settings in the selections

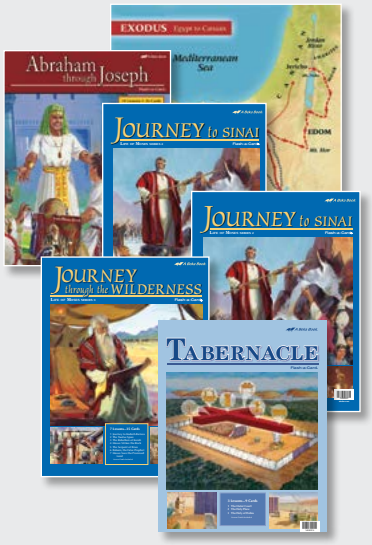
Comprehension, Discussion, & Analysis Skills Development

- 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

Bible

Grade 7

Exodus— First Semester Grade 7



Bible 7 consists of two semester courses: *Exodus* and the *Life of Christ*.

Exodus is designed to give students a basic overview of the way God miraculously delivered His people out of captivity and led them into the Promised Land.

When we understand many of the Israelites' struggles and how God's people often turned away from His leading, it shows us how God will deal with us if we stray from trusting in His perfect plan. By studying *Exodus*, students will clearly see God's patience and mercy as He deals with His people.

Evaluation

- Verses:
  - Verse quizzes (11)
  - 9-weeks verses exam (1)
  - Final verses exam (1)
- Content:
  - Quiz on the books of the Bible (1)
  - 9-weeks content exam (1)
  - Final content exam (1)

Lessons *142* A Beka *Flash-a-Cards*

- Abraham through Joseph (14 lessons)
- Moses in Egypt (17)
- Journey to Sinai (15)
- Journey through the Wilderness (18)
- Tabernacle (6)

Music *37 songs*

- Hymns of the faith, choruses, holiday songs

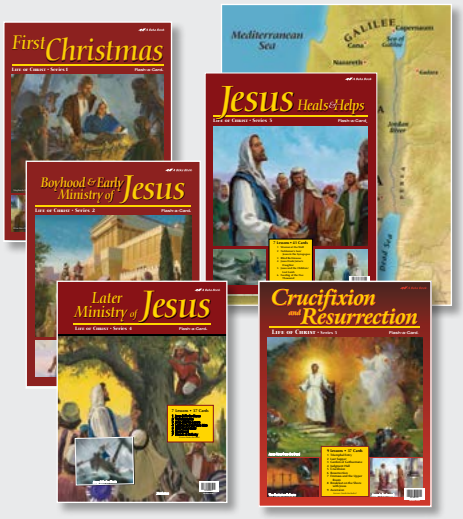
Memory Work

- Passages (11 containing 34 verses) and the books of the Bible

Prayer Time

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

Life of Christ— Second Semester Grade 7



This second-semester course focuses on the many narratives in the Gospels and covers Christ's life from His birth through His ascension. The example that Christ set for believers, both then and now, helps us pattern our lives after our Savior. Christ's teaching and miracles show us what He valued and help us understand His earthly ministry in a more complete way.

Evaluation

- Verses:
  - Verse quizzes (13)
  - 9-weeks verses exam (1)
  - Final verses exam (1)
- Content:
  - 9-weeks content exam (1)
  - Tests (4)
  - Final content exam (1)

Lessons *178* A Beka *Flash-a-Cards*

- First Christmas (8 lessons)
- Boyhood & Early Ministry of Jesus (17)
- Jesus Heals & Helps (13)
- Later Ministry of Jesus (12)
- Crucifixion and Resurrection (17)

Music *40 songs*

- Hymns of the faith, holiday songs, choruses

Memory Work

- Passages (13 containing 35 verses)

Prayer Time

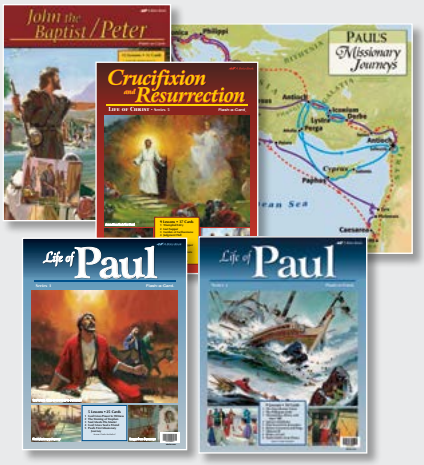
- Learn to pray for each other, our nation, those in authority over us

A Beka Book®

Bible

Grade 8

Book of Acts — First Semester Grade 8



Bible 8 consists of two parts: *Book of Acts* and *Joshua and Judges.*

This first-semester course is designed to give students a basic overview of the life of Peter and Paul, the beginning of the church, and the spread of the gospel to the Gentiles and eventually to the world through Paul's missionary travels.

Through the *Book of Acts*, students may see the power of God at work in His willing servants. His servant Paul is a real person—a person with feelings just like anyone else. Yet Paul's reactions to the trials of life and his indomitable faith in the power of Christ separated him from the nominal Christian life. His life serves as an example for all believers to follow.

Evaluation

- Verses:
  - Verse quizzes (14)
  - 9-weeks verses exam (1)
  - Final verses exam (1)
- Content:
  - 9-weeks content exam (1)
  - Final content exam (1)

Lessons *129 A Beka Flash-a-Cards*

- John the Baptist/Peter (19 lessons)
- Crucifixion and Resurrection (16)
- Life of Paul Series 1 (14)
- Life of Paul Series 2 (21)

Music *44 songs*

- Hymns of the faith, choruses, holiday songs

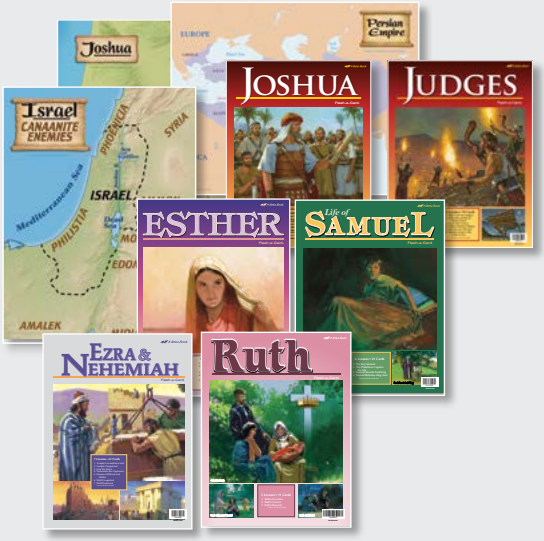
Memory Work

- Passages (14 containing 48 verses)

Prayer Time

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

Joshua & Judges — Second Semester Grade 8



The second-semester course, *Joshua and Judges*, focuses on the nation of Israel after their triumphant exodus from Egypt. The exciting, dramatic account of the conquering of the Promised Land will remind the student of the power of God and the provision for His people. This course begins with the anointing of Joshua and ends with the rule of Israel's judges.

Evaluation

- Verses:
  - Verse quizzes (14)
  - 9-weeks verses exam (1)
  - Final verses exam (1)
- Content:
  - 9-weeks content exam (1)
  - Final content exam (1)

Lessons *154 A Beka Flash-a-Cards*

- Joshua (16 lessons)
- Judges (19)
- Ruth (5)
- Life of Samuel (9)
- Esther (8)
- Ezra and Nehemiah (15)

Music *40 songs*

- Hymns of the faith, holiday, choruses

Memory Work

- Passages (14 containing 44 total verses)

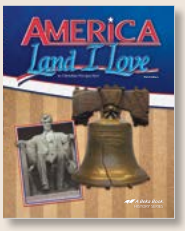
Sword Drill *85 verses*

- Old and New Testament

Prayer Time

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

U.S. History Grade 8



America: Land I Love presents American history from a conservative, biblical perspective: God exalts nations and determines their course in human history. The text promotes the Bible as the center of God's plan. History is the story of individuals to whom God has given the responsibility to make choices.

Unlike secular history textbooks which suggest that material things—economic conditions, geography, political circumstances, or genetics—are the main causes in history, *America: Land I Love* uses biographical accounts to illustrate that history traces God's working through people to accomplish His will. Students will also be studying the geography of the Western Hemisphere and federal, state, and local government as part of this course. Knowledge of and familiarity with local offices and officials will encourage students to use the gift of political expression which is so easily taken for granted in America.

Added Enrichment

- Special feature boxes (52):
  - Give in-depth study of people and events of history that have shaped the U.S.
  - Promote better understanding of U.S. history
  - Help students see lessons to be learned from history and grasp key concepts of U.S. history
- Lists: states and capitals, the U.S. Presidents
- Maps correlating to text (30)

Evaluation

- Review quizzes (35)
- Document memorization quizzes (2)
- U.S. President quizzes (3)
- States and capitals quizzes (5)
- Reading quizzes (31)
- Current event reports (31; each presentation counts as quiz grade)
- Geography projects (18; each counts as quiz grade)
- Tests (8), 9-weeks exam (2)
- Semester exam, final exam
- *Civics Activity Book:*
  - Study of national, state, and local government as information is gathered to complete activities
  - Includes history, geography, and an overview of the Constitution

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Exploration & Settlement in a New World

- New World to explore
  - ➤ God's timing in discovery of America
  - Native American heritage
  - Christopher Columbus
  - Defeat of Spanish Armada
  - Spanish and French exploration:
    - ➤ Robert Cavalier de la Salle
  - ➤ Spanish and French legacy
- First English colonies
  - English exploration and settlement
  - Jamestown
    - Failure of socialism and benefits of free enterprise
    - House of Burgesses
  - ➤ Scrooby Congregation in Leyden
  - Pilgrims and Plymouth
  - Representative government:
    - ➤ General Court
  - Religious freedom
- New colonies
  - Advance of learning: Harvard College, Old Deluder Satan Act
  - Missionary efforts:
    - ➤ Algonquin Bible
    - ➤ Mayhews
  - ➤ New England Confederation
  - King Philip's War
- Life in Colonial America
  - Land of diversity in immigration, churches, and social classes
  - ➤ Advance of learning: schools, apprentices, and universities
  - Agriculture, landholdings, and slavery in the colonies
  - ➤ Contributions to science
  - ➤ Government in the colonies
- Preparation for independence
  - Great Awakening:
    - ➤ Half-way Covenant
    - ➤ Results of Great Awakening
  - French and Indian War:
    - ➤ Seven Years' War
  - ➤ Fundamental differences between the colonists and the English
  - British regulations on the colonists:
    - ➤ Quartering Act, Declatory Act

Birth of the United States

- Home of the brave
  - Conflict with England:
    - ➤ Townshend Acts
    - ➤ Committee of Correspondence
    - ➤ Intolerable Acts
  - Continental Congress:
    - ➤ Olive Branch Petition
  - Declaration of Independence:
    - ➤ Richard Henry Lee
  - War for Independence:
    - ➤ Help from Europe
    - ➤ Haym Solomon, Nathan Hale, Benedict Arnold, James Armistead
    - ➤ Battle of King's Mountain
  - Treaty of Paris

U.S. History cont.

➤ RED indicates first introduction of content.

Birth of the United States cont.

- Land of the free
  - Articles of Confederation and land expansion
  - Constitutional Convention:
    - ➤ Virginia and New Jersey Plan, Connecticut Compromise
  - Structure and basis of American government:
    - ➤ Balancing of powers
  - Bill of Rights
  - Presidencies of George Washington and John Adams:
    - ➤ Cabinet
    - ➤ Rise of political parties
    - ➤ Jay Treaty and Pickney Treaty
    - ➤ Foreign affairs
    - Federalist Era
  - ➤ Constitution of the United States

Building an American Character

- From the Appalachians to the Rockies
  - Daniel Boone
  - Northwest Territory:
    - ➤ Treaty of Greenville
  - Louisiana Purchase:
    - ➤ Zebulon Pike
  - War of 1812:
    - ➤ Impressment and Embargo Act
    - ➤ Battles: Tippecanoe, Lake Erie, Thames River, Horseshoe Bend
    - ➤ Treaty of Ghent
  - Acquisition of Florida
  - ➤ Missouri Compromise
  - ➤ Monroe Doctrine
- Jacksonian Era
  - ➤ States' rights
  - President Andrew Jackson: Trail of Tears, suffrage, and abolition
  - ➤ National Bank
  - ➤ Whig Party
  - ➤ Relations with Britain
- Innovation and inventions
  - Improved transportation and communication
  - Agricultural and industrial advancements
  - Christian influence on industry
  - ➤ Medicine
- Second Great Awakening
  - Circuit riders and camp meetings
  - Charles Finney: Second Great Awakening
  - Evangelism on the home front
    - ➤ Reform movements
  - Beginnings of American foreign missions movement
  - ➤ Impact of the Second Great Awakening
- Education and culture
  - American textbooks: *Blue-Backed Speller* and *McGuffey's Reader*
  - Traditional education
  - ➤ Public education: Horace Mann's normal schools
  - ➤ Louis Agassiz
  - ➤ Romantic Era: schoolroom poets
    - Songwriters and artists
      - ➤ John James Audubon
    - Life in the 19th century
- Promise of the West
  - The Republic of Texas
  - Exploration of the West:
    - ➤ Jedediah Smith and James Beckworth
  - Evangelism and settlement in the Pacific Northwest
  - Marcus Whitman and the Oregon Trail
  - The Mexican War:
    - ➤ Treaty of Guadalupe Hidalgo
  - Mexican Cession
  - California and the gold rush:
    - ➤ Bear Flag Revolt
    - ➤ William Taylor

Times of Testing & Triumph

- Civil War and Reconstruction
  - States' rights
  - Slavery:
    - ➤ Dred Scott Decision
  - Abraham Lincoln
  - Civil War:
    - ➤ North and South differences
    - ➤ Anaconda Plan
    - ➤ Battles: Shiloh, Antietam, Fredericksburg, Chancellorsville, Chickamauga, Chattanooga
    - ➤ Important people: Farragut, McClellan, Stuart, Pickett, Meade
    - ➤ Financing the war
  - ➤ Reconstruction Era
  - Tuskegee Institute:
    - Booker T. Washington
    - ➤ Samuel C. Armstrong
- Age of Industry
  - Inventors: Bell, Edison, Carver
  - ➤ Wonders of technology: Brooklyn Bridge, Statue of Liberty, skyscrapers
  - ➤ Capitalism in medicine
  - Entrepreneurs:
    - Carnegie, Rockefeller
    - ➤ Lyman Stewart
- Gilded Age
  - ➤ Immigration
  - Settlement of the Great Plains:
    - ➤ Dawes Act, Homestead Act
  - ➤ Populist Movement
    - Presidencies of Garfield, Cleveland, Harrison, and McKinley

U.S. History cont.

➤ RED indicates first introduction of content.

Times of Testing & Triumph cont.

- ➤ Evangelism and social reform
- ➤ Art of the Gilded Age
- Growing into greatness
  - Spanish-American War:
    - ➤ Venezuelan Boundary Dispute, de Lôme letter
    - ➤ Platt Amendment
  - U.S. territorial acquisitions
  - ➤ Teddy Roosevelt and the Progressive Movement

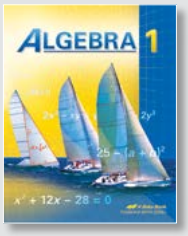
Times of Challenge & Promise

- Into the Twentieth Century
  - World War I:
    - Selective Service Act
    - ➤ Battles: Cantigny, Marne, Belleau Wood, St. Mihiel, Argonne Forest
    - ➤ People: Pershing, Rickenbacker, York
    - ➤ Fourteen Points
  - Roaring Twenties:
    - ➤ Sports and literature
    - ➤ Charles Lindbergh
  - ➤ Billy Sunday and Prohibition
  - Evolution: Scopes trial
  - Presidents Harding and Coolidge:
    - ➤ Foreign affairs
- ➤ Rise of big government
  - ➤ Cause of the Great Depression: government intervention
  - ➤ President Herbert Hoover
  - ➤ Success of private relief
  - ➤ President Franklin D. Roosevelt
  - ➤ New Deal and rise of socialism in America
- A world at war
  - Steps to World War II
  - ➤ Results of socialism and evolutionary thought
  - World War II in Europe and Asia:
    - ➤ Lend-Lease Act
    - ➤ War efforts
    - ➤ Doolittle Raid
    - ➤ Fighting Red Tails
  - Spread of Communism in Eastern Europe
  - Cold War against Communism begins:
    - ➤ Taft-Hartley Act
  - Korean War:
    - ➤ Pusan Perimeter
- Time for freedom and responsibility
  - ➤ Progress and prosperity in the 1950s
  - President Dwight D. Eisenhower:
    - ➤ McCarthy Era
  - ➤ President John F. Kennedy and the New Frontier
  - Civil rights movement
- Troubled times for America
  - ➤ Testing traditional values
  - President L. B. Johnson and the Great Society:
    - ➤ Civil Rights Act
  - Vietnam War:
    - ➤ Tet Offensive
  - ➤ America's decline in the 1970s
  - Presidents Nixon, Ford, and Carter
  - ➤ SALT talks
- Reagan Era and the '90s
  - President Ronald Reagan:
    - Conservative movement of the 1980s:
      - ➤ Thomas Sowell
      - ➤ Iran-Contra hearings
  - Information Age
  - End of Cold War
  - President George Bush:
    - Persian Gulf War
    - ➤ Growing national debt
  - President Bill Clinton:
    - ➤ Liberal agenda
  - ➤ Terrorism threatens America:
    - ➤ Atlanta's Centennial Park
    - ➤ Columbine High School
  - ➤ Last acts of the Clinton Administration
- In defense of freedom
  - President George W. Bush
  - "9/11" and the War on Terror:
    - ➤ Department of Homeland Security
  - Operation Iraqi Freedom: Saddam Hussein
  - President Barack Obama
    - ➤ Affordable Care Act
    - ➤ New Start
  - Land of Opportunity

Geography

- Western Hemisphere
- North America
- The 13 Original Colonies
- Canada
- The War for Independence
- United States: physical
- Washington, D.C.
- Eastern United States
- Central United States
- Westward expansion
- Western United States
- Civil War
- Pacific United States
- Mexico
- Central America
- West Indies
- South America
- United States: political

Algebra 1 Grade 9



Algebra is an extension of arithmetic, and the concepts and procedures of arithmetic are used as the foundation upon which the study of algebra is built. Algebra supplies the language and patterns of reasoning used in the sciences and other branches of knowledge. Algebraic axioms are used to form and solve equations.

Algebra 1 uses mathematical ideas in solving problems ranging from everyday applications to applications in the physical and biological sciences.

Features

- Review exercises for every section (107)
- Informational boxes including mathematical history and applications of algebra (13)
- Reviews in chapter (13)
- Chapter reviews (12)
- Nine-weeks reviews (4)
- Semester reviews (2)
- Final review

Evaluation

- Quizzes (36)
- Tests (8)
- 9-weeks exam (2)
- Semester exam
- Final exam

➤ RED indicates first introduction of content.

Real Numbers and the Language of Algebra

- Using letters, notation
- Terms, coefficients, factors, variables
- Evaluating algebraic expressions with given value
- Translating word phrases into algebra
- Commutative property
  - Addition
  - Multiplication
- Order of operations
- Distributive property
- Simple interest formula
- ➤ Distance formula
- Numbers
  - Integers
  - Natural numbers
  - Whole numbers
  - Real numbers
  - Rational numbers
  - Irrational numbers
- Signed numbers
  - Addition, subtraction, multiplication, division
- Least common denominator (LCD)—numerical
- ➤ Least common denominator (LCD)—algebraic
- Absolute value
- Simplifying algebraic expressions
- Writing formulas from descriptions
- Associative property
  - Addition, multiplication
- Identity property
  - Addition, multiplication
- ➤ Inverse property
  - ➤ Addition, multiplication

Linear Equations in One Variable

- Solving equations
- Addition property of equality
- Multiplication property of equality
- ➤ Linear equations:
  - ➤ Identity, contradiction, conditional
- Clearing equations of fractions, decimals
- Absolute value
  - ➤ Absolute value definition
  - ➤ Linear absolute value equations
  - ➤ Graphing absolute value equations on a number line
- ➤ Literal equations
  - ➤ Dependent variable, independent variable
- Solving word problems
  - ➤ Mixture problems

Linear Equations in Two Variables

- ➤ Cartesian plane
  - ➤ Ordered pair
  - ➤ Abscissa
  - ➤ Ordinate
  - ➤ Origin
  - ➤ Quadrants
  - ➤ Collinear points
  - ➤ Plotting points on the Cartesian plane
- ➤ Develop a table of values for a linear equation
- ➤ Graph a linear equation
- ➤ Slope:
  - ➤ Formula
  - ➤ Horizontal, vertical, zero, undefined
- ➤ X and Y intercepts
- ➤ Standard form of an equation
- ➤ Slope-intercept form
  - ➤ Convert equation to slope-intercept form
  - ➤ Graph equation using slope-intercept form
- ➤ Find equation using point-slope form
- ➤ Parallel and perpendicular lines
  - ➤ Find slope using another slope
  - ➤ Find equation using another equation

Linear Inequalities

- ➤ Law of trichotomy
- ➤ Inequality notation
- ➤ Graphing inequalities on a number line
- ➤ Addition property of inequality

Algebra 1 cont.

➤ RED indicates first introduction of content.

Linear Inequalities cont.

- Multiplication property of inequality
- Solve linear inequalities
- Graph linear inequalities on a number line
- Write inequalities from word problems
- Compound inequalities
  - Interval notation
  - Solve compound inequalities
  - Graph compound inequalities on a number line
- Absolute value inequalities
  - Solve absolute value inequalities
  - Graph absolute value inequalities on a number line
- Linear inequalities in two variables
  - Solve linear inequalities in two variables
  - Graph linear inequalities in two variables

Systems of Equations

- System of linear equations
  - Consistent and inconsistent systems
  - Dependent and independent equations
  - Point of intersection
- Solve a system of linear equations:
  - Graphing
  - Substitution
  - Elimination
- Solve word problems with systems of equations

Polynomial Arithmetic

- Monomial, binomial, trinomial, polynomial
- Degree of polynomial
- Addition of polynomials
  - Combining like terms
- Subtraction of polynomials
- Multiplication of polynomials
  - Multiplying monomials
  - Product rule for exponents
  - Power rule for exponents
  - Multiply polynomials by monomials
  - Multiply a binomial by a binomial
  - FOIL
  - Square a binomial
  - Multiply binomial conjugates
  - Multiply a polynomial by a polynomial
- Division of polynomials
  - Divide monomials
  - Quotient rule for exponents
  - Zero exponent rule
  - Negative exponent rule
  - Divide a polynomial by a monomial
  - Divide a polynomial by a binomial
- Scientific notation
- Solve equations involving simplification
- Write a quadratic equation for a polygon
  - Plane geometric figures
  - Three-dimensional geometric figures

Polynomial Factoring

- Greatest common factors
  - Prime, composite
- Fundamental theorem of algebra
- Factoring:
  - Factor a common factor from a polynomial
  - Perfect square trinomials
  - Difference between two squares
  - Factoring general trinomials
  - Trinomials with a second variable
  - By grouping
- Zero factor property
  - Extraneous solutions
- Solving equations after factoring
- Applying polynomial factoring

Radical Expressions and Equations

- Radical, radicand, index
- Principal root
- Quotient rule for radicals
- Product rule for radicals
- Simplifying radicals
- Adding and subtracting radicals
  - Like radicals
- Multiplying radical expressions
- Rationalizing the denominator of a radical
  - Rationalizing two term denominators:
  - Conjugate
- Rational exponent property
- Expressions with rational exponents:
  - Simplify, multiply, divide
- Solving radical equations
- Pythagorean theorem:
  - Hypotenuse, legs
- Distance formula
  - Find distance between two points from formula
- Find distance between two points from graph

Quadratic Equations

- Quadratic equations in standard form
- Solve quadratic equations by:
  - Factoring
  - Extracting the root
  - Completing the square
  - Quadratic formula
- Pure quadratic
- Discriminant
- Applying quadratic equations in word problems

Algebra 1 cont.

➤ RED indicates first introduction of content.

Statistics and Probability

- Statistics
  - ➤ Descriptive
  - ➤ Inferential
  - ➤ Graphs features:
  - ➤ Chart title, scale, gridlines, zero line, category label, axis title, major and minor gridlines, data label, legend
- Bar graph
  - Interpreting bar graphs
  - Creating bar graphs
  - Frequency
  - ➤ Trend
  - ➤ Segmented bar graph
  - ➤ Interpreting segmented bar graphs
  - ➤ Clustered bar graph
  - ➤ Interpreting clustered bar graphs
- Percent of change
- Circle graphs
  - Creating circle graphs
  - Interpreting circle graphs
- ➤ Types of information
  - ➤ Qualitative
  - ➤ Quantitative
  - ➤ Classes categorization
- ➤ Stem-and-Leaf plots
  - ➤ Stem
  - ➤ Leaf
  - ➤ Creating stem-and-leaf plots
  - ➤ Interpreting stem-and-leaf plots
- Histograms
  - ➤ Creating histograms
  - Interpreting histograms
  - ➤ Frequency distribution
  - ➤ Symmetric or asymmetric distribution
- ➤ Measure of center
  - Arithmetic mean
  - Median
  - ➤ Outlier
  - Mode
- ➤ Box-and-Whisker plot
  - ➤ Creating box-and-whisker plot
  - ➤ Interpreting box-and-whisker plot
  - ➤ Dispersion
  - ➤ Five-number summary
  - ➤ Minimum
  - ➤ Maximum
  - ➤ Quartiles
  - ➤ Skewness
- ➤ Scatterplots
  - ➤ Univariate date
  - ➤ Bivariate data
  - ➤ Explanatory and response variable
  - ➤ Positive and negative association
  - ➤ Causation
  - ➤ Line of fit
  - ➤ Exponential growth
  - ➤ Interpolation
  - ➤ Extrapolation
- Probability
  - Outcome
  - ➤ Mutually exclusive or not mutually exclusive
  - Calculate probability of single event
  - ➤ Probability notation
  - Independent events
  - ➤ Dependent events
  - ➤ Probability of multiple events
  - ➤ Conditional probability
  - ➤ Tree diagram

Rational Expressions and Equations

- ➤ Rational expression
  - ➤ Undefined
  - ➤ Domain
- ➤ Simplifying rational expressions
- ➤ Multiply rational expressions
- ➤ Divide rational expressions
- ➤ Add and subtract rational expressions
  - ➤ Least common denominator of rational expressions
- ➤ Complex fractions
- ➤ Solving rational equations
  - Proportion
- Word problems
  - Ratios and proportions
  - ➤ Word problems involving work

Functions

- ➤ Direct variation
  - ➤ Constant of variation
  - ➤ Dependent variable and independent variable
- ➤ Functions
  - ➤ Relation
  - ➤ Function notation
  - ➤ Determine if an equation is a function
- ➤ Domain of functions
- ➤ Zero of a function
- ➤ Parabola
  - ➤ Vertex
  - ➤ Parabola vertex formula
- ➤ Graph parabolas
  - ➤ Rigid transformations
  - ➤ Non-rigid transformations
  - ➤ Parent function
  - ➤ Vertical translation
  - ➤ Horizontal translation
  - ➤ Standard graphing form of a parabola

Science: Earth & Space Grade 8

Science: Earth and Space lays a foundation for future study of the nonliving world. The text begins "from the ground up," starting with soil science and geology. Students learn how geology and the fossil record support the biblical record of a worldwide Flood—not the hypotheses of evolution.

The exploration of the seas includes studying currents, tides, and ocean floor. An investigation of the atmosphere and processes that cause weather includes overviews of several weather phenomena and of measuring and forecasting the weather.

The solar system, stars, and galaxies are examined as the creation of God; evolutionary hypotheses of solar-system formation are briefly discussed and shown to be scientifically unsound. Students learn about man's study and use of astronomy, including an overview of manned and unmanned spaceflight.

The text concludes with a study of environmental issues, thus teaching students to be good stewards of the natural resources God has provided.

Added Enrichment

- Feature boxes with activities, extra information, hands-on investigations for the classroom and at home
- Short articles highlighting God's design in creation (5)
- Challenging homework questions designed to provoke thinking more deeply about concepts taught (53)
- Thought-provoking review exercises (53)
- Highlighted fun facts (142)
- Review activities to prepare for tests (28)

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

Evaluation

- Reading quizzes (23)
- Review quizzes (36)
- Science project with background paper, investigation plan, experimentation, and oral presentation (counts as 2 quiz grades and 2 test grades)
- Tests (8), 9-weeks exam (2)
- Semester exam, final exam

Introduction to Science

- Using the scientific method:
  - Three main components: hypothesizing, observation, experimentation
  - Six steps

Pedology: Soil Science

- Characteristics of soil:
  - Organic and mineral materials, humus
  - Topsoil, subsoil, bedrock
  - ➤ Texture: sand, silt, clay, loam
  - ➤ Colors: Munsell charts
  - ➤ Soil pH: pH scale
- Soil nutrients—nutrients and primary plant food elements:
  - ➤ Fertilizer composition: phosphates, nitrogen, potassium
  - ➤ Nitrogen:
    - ➤ Nitrogen cycle, nitrogen compounds
    - ➤ Nitrogen-fixing bacteria
    - ➤ Nitrifying bacteria, denitrifying bacteria
  - ➤ Phosphorus: cell division, growth, plant maturity
  - ➤ Potassium: general health of plant and disease resistance
- Air and water in the soil:
  - ➤ Ground air: pore spaces
  - Ground water:
    - ➤ Saturated, water table, artesian well
    - Aquifer, capillarity

Geology

- Structure of the earth:
  - Introduction to geology: defined
  - Crust—outer layer:
    - Covered with sediment
    - ➤ Oxygen, silicon, aluminum, iron
  - Mantle—middle layer:
    - ➤ Seismic waves, upper mantle, transition zone, lower mantle
    - Moho
  - Core:
    - Outer and inner core
    - ➤ Core-mantle boundary
  - Movements of crust:
    - Plates, plate tectonics
    - ➤ Lithosphere
    - ➤ Development of plate tectonics theory
    - ➤ Relationship of plate tectonics to biblical record
    - ➤ Pangaea, types of faults and folds
    - ➤ Mountains: volcanic, domed, folded, fault-block
- Earthquakes:
  - Earthquakes and tremors:
    - Tectonic earthquakes, tsunamis, aftershocks
    - Seismology, faulting, elastic rebound theory
    - San Andreas Fault, focus epicenter
  - ➤ Earthquake waves: P waves, S waves, surface wave, seismograph, seismogram, locating an earthquake's epicenter
  - Earthquake zones: circum-Pacific belt, Alpide belt
  - Earthquake strength:
    - ➤ Modified Mercalli Scale
    - Richter magnitude scale
    - ➤ Moment magnitude scale
  - ➤ Studying earthquakes:
    - ➤ Provide information about earth's interior
    - ➤ San Andreas Fault Observatory at Depth
  - Reducing earthquake damage:
    - ➤ Fixed-base, base-isolated, and energy-dissipating systems

Science: Earth & Space cont.

➤ RED indicates first introduction of content.

Geology cont.

- Volcanoes:
  - Magma, magma chamber, cone
  - ➤ Volcanology
  - Types of volcanoes: cinder-cone, shield, composite, active, dormant, extinct
  - Location of volcanoes: Ring of Fire
  - Volcanic eruptions and ejecta:
    - ➤ Types of lava
    - Pyroclasts:
      - Volcanic ash, lapilli, volcanic blocks, volcanic bombs
      - ➤ Difference between volcanic blocks and volcanic bombs, pyroclastic flows
  - Volcanic structures:
    - Calderas
    - ➤ Lava tunnels
    - ➤ Igneous intrusions: dikes, sills, laccoliths, batholiths
- Introduction to minerals:
  - Study of minerals:
    - Mineralogy, crystals
    - ➤ Groups of minerals (halides, sulfides, sulfates, oxides, carbonates, phosphates, silicates); faces
  - Identifying minerals:
    - Surface color, streak color, luster, hardness, Mohs scale
    - Cleavage, acid test
    - ➤ Specific gravity, special properties (fluorescence, phosphoresence)
- Notable minerals:
  - Metals:
    - Ore, useful metals
    - ➤ Metallurgy, Bayer process, Hall-Héroult process
    - Iron, alloy, precious metals
    - ➤ Blast furnace, direct iron reduction
  - Gemstones:
    - Precious stones, diamond pipes, semiprecious stones
    - ➤ Simulant and synthetic gemstones
    - ➤ Methods of synthesizing: flame fusion process, pulled method, hydrothermal synthesis
- Rocks—petrology:
  - Igneous rocks:
    - Intrusive and extrusive rock
    - Coarse-grained, fine-grained
    - ➤ Porphyritic (mixed-textured), amorphous, porous
  - Sedimentary rocks:
    - ➤ Concretions, stratum, law of superposition
    - Mechanical sediments:
      - Conglomerate rock
      - ➤ Clastic sedimentary rock
    - Chemical sediments:
      - ➤ Precipitate, evaporites, salt domes
    - Organic sediments:
      - Fossil fuel, types of coal, bitumen, surface mining
      - Underground mining:
        - ➤ Longwall, continuous, and retreat mining
  - Metamorphic rocks:
    - Metamorphism:
      - ➤ Contact and regional metamorphism
    - Foliated and nonfoliated rocks
    - ➤ Characteristics of metamorphic rocks
- Weathering:
  - Physical weathering:
    - ➤ Ice wedging, exfoliation
  - Chemical weathering:
    - ➤ Causes, rate
- Erosion:
  - Erosion by rain:
    - ➤ Runoff, sheet erosion
    - Gullying
  - Erosion by rivers:
    - ➤ Headwaters, load, river system, drainage basin, drainage divide
    - ➤ Tributary, floodplain, levees, meanders, oxbow lake, alluvial fan
  - Erosion by groundwater:
    - Caverns, stalactite, stalagmite, column, sinkhole
    - ➤ Dripstone, karst
  - Erosion by the sea:
    - Beaches, sea caves
    - ➤ Bars, barrier islands, promontories, sea cliff, sea arches, sea stack
  - Erosion by glaciers:
    - ➤ Continental glaciers, ice caps, valley glaciers, crevasses
    - ➤ Cirque, arête, horn, fjord, striae, till, moraine, drumlins
    - ➤ Outwash, kettles, Ice Age
  - ➤ Erosion by wind:
    - ➤ Aeolian processes, deflation, sand and dust storms, sand dunes
    - ➤ Crescentic, parabolic, and transverse dunes
    - ➤ Abrasion
  - ➤ Erosion by gravity:
    - ➤ Mass wasting, soil creep, mudflows
    - ➤ Avalanche, landslides, rockfall
  - Preventing erosion:
    - Terracing
    - ➤ Strip-cropping, breakwaters

Interpreting the Fossil Record

- Conflicting views of the beginning:
  - Special creation, evolution:
    - ➤ Big bang, theistic evolution
  - ➤ Limitations of geology: principle of uniformity
  - ➤ Geology and the Genesis Flood
  - Uniformitarianism: Charles Lyell, problems with, Charles Darwin
  - ➤ Catastrophism: Georges Cuvier
- Paleontology:
  - Fossil formation
  - ➤ Geologic column:
    - ➤ Eons, eras, periods, epochs, index fossils
    - ➤ Imaginary arrangement, circular reasoning, anomalies
  - ➤ Radiometric dating: carbon-14 dating
  - ➤ Biblical explanation of the fossil record
- ➤ Evidence of a flood:
  - ➤ Quick deposition: massive "graveyards," polystrate fossils, unconformity
  - ➤ Living fossils: coelacanth, stasis

Science: Earth & Space cont.

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Interpreting the Fossil Record cont.

- Evidence against evolution:
  - ➤ "Missing links":
    - ➤ *Seymouria, Archaeopteryx, Tiktaalik*
  - ➤ Cambrian explosion
  - ➤ Impossibility of intermediates
  - Natural selection and intermediates
  - Punctuated equilibrium
- Evolution of man—a mistaken belief:
  - ➤ Man vs. ape: body structure, upright posture, cranial capacity
  - Questionable intermediates:
    - Ramapithecus, Neanderthal man
    - ➤ Authralopithecines, Lucy, *Homo habilis,* Skull 1470
    - ➤ *Homo erectus,* Java man, Peking man, Cro-Magnon man
  - True origin of man: created in God's image

The Seas

- Water of the seas—oceanography:
  - Characteristics of seawater:
    - Composition, salinity
    - ➤ Color, temperature, density, hydrostatic pressure
  - ➤ Ice of the seas: sea ice, icebergs, ice shelf
- Movement of the seas:
  - Ocean currents:
    - ➤ Surface currents, gyre
    - Gulf Stream, Peru Current
    - ➤ Subsurface currents: density current, turbidity current
    - ➤ Upwelling, countercurrent
  - Waves and related phenomena:
    - Crest, trough
    - ➤ Period, whitecaps, ocean swells, breaker, surf
    - ➤ Undertow, longshore current, rip current
    - ➤ Tsunami formation, propagation, and warning systems
  - Tides:
    - High, low, spring, neap tides
    - ➤ Diurnal, semidiurnal, mixed semidiurnal
- Geography of the seas:
  - Continental margin:
    - Continental shelf, continental slope
    - ➤ Shelf break, continental rise, submarine canyons
- Deep ocean floor:
  - Seamount, atoll, lagoon, mid-ocean ridge
  - ➤ Abyssal plain, Mid-Atlantic Ridge, hadal zone
- Study of the seas:
  - Introduction to oceanography:
    - Matthew Maury
    - ➤ H.M.S. *Challenger*
  - Vessels of the oceanographer:
    - Submersibles
    - ➤ Research vessel, bathyscaphe
    - ➤ Deep Submergence Vehicles, remotely operated vehicle
    - Manned undersea laboratories
  - Equipment of the oceanographer:
    - ➤ Oceanographic buoys, drift bottles, profiling floats
    - ➤ Niskin bottles, rosette, gravity corer, piston corer
    - Sonar, scuba

The Atmosphere

- Introducing the atmosphere:
  - Atmospheric composition:
    - ➤ Homosphere, heterosphere
    - Composition of air, water vapor, ozone
  - Layers by temperature:
    - Troposphere:
      - ➤ Temperature gradient, tropopause
    - Stratosphere, ozone layer:
      - ➤ Types of ultraviolet radiation
    - Mesosphere, thermosphere, exosphere:
      - ➤ Mesopause, thermopause
  - Ionosphere:
    - ➤ Cosmic rays, plasma
  - Magnetosphere:
    - Poles, magnetic field, auroras
    - ➤ Van Allen radiation belts
  - Atmospheric pressure: weight of air
- Heat and the atmosphere:
  - Balanced system:
    - ➤ Radiation, albedo
    - Insolation:
      - ➤ Factors affecting insolation
      - ➤ Perihelion, aphelion, energy budget
    - Greenhouse effect:
      - ➤ Greenhouse gases
  - Heat distribution in the atmosphere:
    - ➤ Conduction, convection, convection currents
    - Updrafts, downdrafts
    - ➤ Adiabatic heating and cooling
- Patterns of circulation:
  - Circulating currents:
    - Low pressure, high pressure, global winds
    - ➤ Convection cell, Hadley cell
  - Coriolis effect:
    - ➤ Inertia, cyclone, anticyclone
  - Earth's wind zones:
    - ➤ Intertropical Convergence Zone (ITCZ or doldrums), horse latitudes
    - Trade winds, polar easterlies, prevailing westerlies
    - ➤ Jet streams, Rossby waves
  - Local winds:
    - ➤ Monsoon effect
    - ➤ Sea, lake, land, and forest breezes
    - ➤ Anabatic, katabatic, fall winds, and the mistral
    - ➤ Foehns, chinooks, Santa Ana winds

Weather

- Understanding weather—climate, meteorology:
  - Factors causing weather: heat energy, uneven heat distribution, water vapor
  - Atmospheric water vapor:
    - Melting, freezing, precipitation, condensation
    - Saturated, relative humidity
    - Dew and frost points:
      - Dew, frozen dew, frost
      - ➤ Condensation nuclei, frost point, deposition, supercooled, freezing nuclei

Science: Earth & Space cont.

➤ RED indicates first introduction of content.

Weather cont.

- Clouds and fog:
  - Naming clouds:
    - Based on:
      - Shape
      - ➤ Height
    - Cumulus, stratus, cirrus, and variations of these three
    - ➤ Lenticular, contrails
  - Fog:
    - Radiation and steam fog
    - ➤ Mist; advection, upslope, and freezing fog
    - ➤ Smog, photochemical smog
  - Precipitation—water cycle
  - Liquid precipitation:
    - Rain, raindrops, snowflakes, drizzle, freezing rain
    - ➤ Bergeron process, collision-coalescence process
  - Solid precipitation:
    - Sleet, snow, dendrite, hail
    - ➤ Flurries, snow squall, blizzard, whiteout, glaze, rime
  - ➤ Drought: conditions for; agricultural, hydrological, and socioeconomic droughts
- Air masses:
  - Types of:
    - Maritime tropical, continental tropical
    - Maritime polar, continental polar, Arctic
    - ➤ Air-mass weather
  - Fronts and weather:
    - Warm and cold fronts
    - ➤ Stationary and occluded fronts
    - ➤ Frontal cyclones
- Thunderstorms, lightning, and tornadoes:
  - Thunderstorms:
    - ➤ Stable and unstable air, stages of development
    - ➤ Downbursts, cells, supercell
    - Squall line
  - Lightning:
    - Formation, stepped leader, thunder
    - ➤ Return stroke, dart leader
    - Types:
      - ➤ Negative and positive cloud-to-ground, hot lightning, ground-to-cloud, ball lightning
  - Tornadoes:
    - Formation, dangers
    - ➤ Mesocyclone, condensation funnel, occurrence
    - ➤ Enhanced Fujita scale, waterspout, dust devil
- Hurricanes:
  - ➤ Life of a hurricane: tropical cyclone, tropical disturbance
  - ➤ Cyclone categories:
    - ➤ Tropical depression, tropical storm
    - ➤ Saffir-Simpson Hurricane Wind Scale
  - ➤ Hurricane structure: eye, eye wall
  - Hurricane dangers:
    - Wind, inland flooding
    - ➤ Storm surge
- Measuring and forecasting weather:
  - Measuring basics:
    - Thermometer:
      - ➤ Maximum-minimum, bimetallic strip, and electrical thermometers; thermograph
    - Barometer:
      - Bar
      - ➤ Aneroid barometer, millibars
    - Hygrometer:
      - Psychrometer
      - ➤ Wet-bulb depression, hair hygrometer
    - Weather vane
    - ➤ Anemometer
    - ➤ Rain gauge, Stevenson Screen
  - Modern measurements:
    - ➤ Automated instruments, automatic weather stations
    - ➤ Transmissometer, visibility
    - Weather balloons:
      - ➤ Radiosonde
    - ➤ Sounding rocket, ceilometers
    - Radar, weather satellite
  - ➤ Summarizing weather conditions: surface weather charts, station model, isobars, isotherms
  - Predicting weather conditions: weather forecasts, supercomputers
  - Do-it-yourself forecasting: predictable patterns, analyzing clouds

Astronomy

- Solar System:
  - Structure of the solar system:
    - Orbit
    - ➤ Geocentric, Aristotle
    - Ptolemy
    - Copernicus, Galileo, Kepler
    - ➤ Heliocentric
  - Planetary motions:
    - Elliptical paths, Kepler's three laws of planetary motion
    - Astronomical units
  - Gravity and the solar system:
    - Sir Isaac Newton, law of universal gravitation
  - ➤ Origin of the solar system: Creation vs. nebular hypothesis
  - Interplanetary space: vacuum
  - Planets:
    - Mercury: speediest planet
    - Venus:
      - Earth's twin, morning and evening star
      - ➤ Retrograde
    - Earth:
      - Life-sustaining planet
      - Moon, satellite, lunar month, maria
      - ➤ Terrae, rays
      - Phases of the moon, solar eclipse, lunar eclipse
    - Mars: red planet, Phobos, Deimos, Tharsis Bulge, Olympus Mons
    - Jupiter:
      - Largest planet, Great Red Spot, Galilean satellites

Science: Earth & Space cont.

➤ RED indicates first introduction of content.

Astronomy cont.

- Saturn:
  - Second-largest, "shepherd moons," Titan, Iapetus, Mimas, Phoebe
  - ➤ Enceladus
- Uranus:
  - Retrograde rotation
  - ➤ Titania, Oberon, Miranda, Cordelia, Ophelia
- Neptune: discovered mathematically before seen
- ➤ Planets vs. dwarf planets: Pluto and moons, Eris
- Asteroids: asteroid belt, Ceres, Trojan asteroids, near-earth asteroids
- Comets:
  - ➤ Edmond Halley
  - Halley's comet, nucleus, coma, tail
  - ➤ Short-period comet, long-period comet
  - Kuiper belt
- Meteoroids: meteor, meteor shower, meteorites

- Constellations:
  - ➤ Celestial sphere:
    - ➤ Horizon, distance between objects, celestial poles
    - ➤ Celestial equator, circumpolar
    - Polaris, zodiac
  - ➤ Modern definition of *constellation*, asterisms
  - Seasonal constellations:
    - ➤ Spring constellations
    - ➤ Summer constellations: Lyra, Vega, Summer Triangle
    - ➤ Autumn and winter constellations
    - Great Square
  - Southern constellations: Centaurus and Crux
- Sun, stars, and galaxies:
  - Sun:
    - Core, photosphere, granule, sunspots
    - ➤ Supergranules
    - Chromosphere, spicules, solar flares, solar prominence
    - ➤ Transition region
    - Corona, solar wind
  - Stellar measurements:
    - Light-year
    - ➤ Parallax, stellar parallax, parsec
  - Star magnitude: apparent magnitude, absolute magnitude
  - Star categories:
    - Temperature and color, temperature and magnitude
    - ➤ Hertzsprung-Russell diagram
    - Giants, supergiants, main sequence, white dwarfs
    - ➤ Red dwarfs
  - Stars in groups:
    - Binary star, optical double
    - ➤ Open clusters, globular clusters
  - Stellar explosions:
    - Nova, supernova, pulsar
    - ➤ Neutron star
  - Galaxies:
    - Milky Way, clusters, Local Group, Andromeda galaxy
    - Superclusters
    - Spiral, barred, elliptical, and irregular galaxies
    - ➤ Lenticular galaxies
  - ➤ Quasars
  - Nebulae

Man & the Universe

- Instruments of astronomy:
  - Visible light astronomy:
    - Telescope, refracting telescope, objective
    - Eyepiece, reflecting telescope
    - ➤ Resolution
  - Spectroscopy: visible spectrum, spectroscope, spectrogram
  - Radio wave astronomy:
    - Radio telescopes
    - ➤ Interferometry
- Astronomy and time:
  - ➤ Meridian and transits: zenith, nadir, meridian, transit
  - Day and night:
    - ➤ Sidereal day
    - ➤ Apparent solar day, mean solar day, equation of time
    - Standard solar time, summer time
  - Longer times: lunar month, solar year, week
  - Calendars:
    - Gregorian
    - ➤ Julian, Jewish
  - Ecliptic and climates:
    - ➤ Equinox, precession of the equinoxes, solstice
    - Climate zones
  - Seasons:
    - ➤ Relationship to equinoxes and solstices; lengths
    - Causes
- History of spaceflight:
  - Rockets: solid-fuel rocket, Robert Goddard, liquid-fuel rocket, Wernher von Braun
  - Race to the moon:
    - *Sputnik 1, Explorer 1*
    - Yuri Gagarin, Alan Shepard, John Glenn, Valentina Tereshkova
    - Gemini and Apollo Programs, Saturn V, Neil Armstrong
  - Manned space stations: Salyut program, *Skylab, Mir,* International Space Station
  - Space shuttle
  - Spaceflight today:
    - ➤ Nations in space
    - Private space flights
- Orbits and satellites:
  - Objects in orbit:
    - ➤ Apogee, perigee
    - Geostationary orbit, polar orbit
    - ➤ Sun-synchronous orbits, Hohmann transfer orbit
  - Unmanned satellites:
    - Astronomical, communications, weather, navigational
    - Earth observation, military satellites, GPS
  - Unmanned space probes:
    - ➤ Escape velocity

Environmental Science

- Environment and pollution:
  - Introduction to environmental science:
    - Biotic and abiotic factors, biogeochemical cycles
    - ➤ Preservationists, conservationists
    - Pantheism