

Praxis 5001 Study Guide

Elementary Education: Multiple Subjects

230+ High-Yield Terms & Concepts

- Combined 245 questions | 4h35m | 4 subtests (5002-5005)
- Reading & Language Arts, Mathematics, Social Studies, Science
- Science of Reading terms, math, civics & science inquiry concepts
- State cut scores, \$180 fee, 28-day retake, 8002-8006 transition note
 - Key facts, Praxis tips & examples for every concept

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How to Use This Guide

The Praxis 5001 Elementary Education: Multiple Subjects test is the flagship content-knowledge test for elementary teachers in roughly 35-40 states. It is computer-delivered, combines 245 selected-response questions in 4 hours 35 minutes, and is built from four separately-timed subtests: Reading & Language Arts (5002), Mathematics (5003), Social Studies (5004), and Science (5005). Each subtest is scored 100-200, and the passing score is set PER STATE (commonly 155-159, often the 157/157/155/159 pattern) - so know your state's score before you register.

IMPORTANT - CHECK YOUR STATE CODE FIRST: ETS launched the redesigned Elementary Education Fundamentals series (codes 8002-8006) in March 2026, phasing in state-by-state to replace 5001/7001/5901/7811 by about August 2028. The 5001 is **STILL VALID** and accepted in most states during the transition, but you must confirm **WHICH** test code your state currently requires at ets.org/praxis (state requirements page) before registering. Some states have adopted the 7001 variant, which folds Teaching Reading content into Reading & Language Arts with no essay. Build your study plan around the code your state lists.

Work through the four subtest sections in order on your first pass. Each concept gives you the key facts, a high-yield Praxis tip, and a practical example. Mark anything unfamiliar and come back to it 48 hours later. Reading & Language Arts carries the most questions (~80), then Social Studies (~60), Science (~55), and Mathematics (~50-60) - weight your review time to match.

How to use the concepts

- Each concept = term + key facts + high-yield Praxis tip (+ example where useful).
- First pass: read every concept in order. Underline anything unfamiliar.
- Second pass: focus only on the concepts you underlined.
- Two weeks before test day: rapid-review every tip line (they are the highest-yield).
- Use the Table of Contents to jump straight to your weakest subtests.
- Pair this guide with the free ETS Study Companion for 5001 and official practice questions.

Note: this is an independent study aid, not affiliated with or endorsed by Educational Testing Service (ETS) or any state education agency. Exam formats, fees, passing scores, and required test codes change - verify current detail with the official ETS Praxis materials (ets.org/praxis) and your state's requirements.

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48 concepts

44 concepts

44 concepts

PART 1: EXAM OVERVIEW - THE PRAXIS 5001

Computer-delivered, 245 questions, 4h35m, four subtests, state-set passing scores, \$180 fee, 28-day retake. And the 8002-8006 transition: check your state code first.

1 What Is the Praxis 5001

The Praxis 5001 Elementary Education: Multiple Subjects test measures the content knowledge elementary teachers need across four subject areas. It is administered by Educational Testing Service (ETS) and is required or accepted by roughly 35-40 U.S. states for elementary licensure.

Praxis tip: Know the umbrella term: 5001 is the combined test; its four subtests have their own codes (5002-5005).

Example: A candidate in Ohio registers for the combined 5001 rather than four separate tests.

2 The Four Subtests

5001 combines four separately-timed subtests: 5002 Reading & Language Arts (~80 selected-response questions, 90 minutes), 5003 Mathematics (~50-60 questions, 65 minutes), 5004 Social Studies (~60 questions, 60 minutes), and 5005 Science (~55 questions, 60 minutes).

Praxis tip: Reading & Language Arts is the biggest subtest - budget the most study time there.

Example: Your score report lists one scaled score for each of the four subtests.

3 245 Questions, 4h35m

The combined test has 245 selected-response questions and a total testing time of 4 hours 35 minutes, split across the four subtests with each timed separately. That is roughly one question per minute across the whole day.

Praxis tip: Pace yourself at about one question per minute; do not let any single item eat the clock.

Example: In the 60-minute Social Studies subtest you should be near question 30 at the 30-minute mark.

4 Computer-Delivered

All 5001 subtests are computer-delivered at authorized ETS/Pearson test centers. You navigate questions on screen, can mark items to revisit within a subtest, and use the on-screen tools (calculator on the Mathematics subtest) plus scratch paper.

Praxis tip: Practice on a computer before test day - the on-screen format matters as much as the content.

Example: You flag a hard math item, finish the subtest, and return to it before the 65 minutes end.

5 Selected-Response Format

Every 5001 question is selected-response: multiple choice with four options, or similar closed formats. There is no penalty for guessing, so you should answer every question, and there is exactly one credited answer per item.

Praxis tip: Never leave a question blank - an educated guess can only help.

Example: You eliminate two of four options and choose between the remaining two, then move on.

6 Scoring: 100-200 per Subtest

Each subtest is reported on a 100-200 scaled score scale. The combined 5001 does not produce one total score - you receive four subtest scores, and you must reach the passing score for each one your state requires.

Praxis tip: A strong overall day does not rescue one failed subtest - every required score matters independently.

Example: You earn 162 on Reading, 158 on Math, 156 on Social Studies, and 160 on Science.

7 Passing Scores Are Set Per State

ETS does not set a single passing score for 5001; each state's education agency sets its own required minimums. They commonly fall in the 155-159 range, often following the 157/157/155/159 pattern across subtests, but you must verify YOUR state's exact numbers.

Praxis tip: Look up your state's passing scores on the ETS state requirements page before you register.

Example: Your state requires 157 Math and 159 Science; you know exactly what to aim for.

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Fee: \$180 Combined (\$64 Each)

The combined 5001 registration is \$180, which covers all four subtests in one sitting. Registering for a single subtest separately costs \$64. Fees are set by ETS and can change - confirm the current amount when you register.

Praxis tip: If you only need to retake one subtest, the \$64 single-subtest option is the usual route.

Example: You fail only Science, so you register for 5005 alone at \$64 rather than paying \$180 again.

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Retake: 28-Day Wait

If you do not reach a state's passing score on a subtest, you may retake that subtest after a 28-day waiting period from your most recent attempt. You retake only the subtests you failed - passed subtests generally carry forward per your state's rules.

Praxis tip: The 28-day clock starts from test date, not from when scores post - plan your calendar.

Example: You fail Math on April 3; the earliest retake date is May 1.

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No Constructed Response on 5001

The 5001 itself has no essay or constructed-response items - everything is selected-response. Some states separately require the Teaching Reading (5204) test or add a writing component, and the 7001 variant drops the essay too.

Praxis tip: Do not practice for an essay you will not see on 5001 - but check whether your state adds one separately.

Example: Your state requires Teaching Reading 5204 in addition to the four 5001 subtests.

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The 8002-8006 Transition (CHECK YOUR STATE CODE)

ETS launched the redesigned Elementary Education Fundamentals series (8002-8006) in March 2026, phasing in state-by-state to replace 5001/7001/5901/7811 by about August 2028. The 5001 is still valid and accepted in most states during the transition, but you MUST check which code your state currently requires at ets.org/praxis before registering.

Praxis tip: This is the single most important registration step: confirm 5001 vs 8002-8006 for your state TODAY.

Example: Your state's teacher-licensure page now lists 8003 (Math) instead of 5003 - you register for the new code.

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The 7001 Variant

Some states adopted the 7001 Elementary Education: Multiple Subjects variant, which folds Teaching Reading content into the Reading & Language Arts subtest and includes no essay. Its subtest codes differ (e.g., 7002-7005) and passing scores are set per state.

Praxis tip: If your state lists 7001, the study content is the same four subjects - just verify which code appears on your registration.

Example: You find 7001 on your state's requirements page and register for that code instead of 5001.

PART 2: READING & LANGUAGE ARTS (5002)

~80 questions / 90 minutes. Foundations of reading (Science of Reading), literature & informational text, writing, language conventions, speaking & listening.

13 Science of Reading

The Science of Reading is the body of research (cognitive science, linguistics, psychology) on how the brain learns to read. It emphasizes explicit, systematic instruction in phonological awareness, phonics, fluency, vocabulary, and comprehension - the five pillars - rather than relying on cueing from pictures or context.

Praxis tip: The Science of Reading is current standards language - expect concepts from phonemic awareness through comprehension on the test.

Example: A school adopts a phonics-based curriculum after its literacy team studies the reading-science research.

14 Phonological Awareness

Phonological awareness is the broad ability to recognize and manipulate spoken language units: words in sentences, syllables, onset-rime, and individual phonemes. It is an oral skill - no print involved - and it develops before phonics.

Praxis tip: Phonological awareness = sound only, no letters. Phonemic awareness is its most advanced layer.

Example: A child claps the syllables in 'elephant' (el-e-phant) - that is phonological awareness, no letters shown.

15 Phonemic Awareness

Phonemic awareness is the ability to hear, identify, and manipulate individual phonemes (the smallest units of sound) in spoken words - blending, segmenting, and deleting sounds. It is the strongest early predictor of reading success and underlies phonics instruction.

Praxis tip: Phonemic awareness is about individual sounds in words; blending and segmenting are the two highest-yield skills.

Example: A student says the sounds /c/ /a/ /t/ separately and then blends them to say 'cat'.

16 Phonics

Phonics is the method of teaching reading by connecting letters (graphemes) to sounds (phonemes) - the alphabetic principle in action. Systematic phonics teaches letter-sound correspondences in a planned sequence, then applies them to decode words.

Praxis tip: Phonics = letters to sounds (print to speech); phonological awareness = sounds alone.

Example: After learning that 'sh' says /sh/, a student decodes 'shop' and 'fish' by sounding them out.

17 Alphabetic Principle

The alphabetic principle is the understanding that letters represent sounds and that those letter-sound relationships combine to form words. It is the essential insight that bridges speech to print and is the foundation phonics instruction builds on.

Praxis tip: The alphabetic principle = the insight that print maps to speech - the 'aha' of early reading.

Example: A kindergartner realizes the word 'dog' is represented by letters d-o-g that match its spoken sounds.

18 Grapheme-Phoneme Correspondence

A grapheme is a written symbol (letter or letter group) that represents a phoneme; grapheme-phoneme correspondence is the mapping between them. Examples: 'b' -> /b/, 'ch' -> /ch/, 'igh' -> /i/.

Praxis tip: Know that one grapheme can be one or more letters (digraphs, trigraphs) and some letters make multiple sounds.

Example: 'igh' in 'light' is one grapheme for the long-i sound - three letters, one phoneme.

19 Phoneme Blending

Phoneme blending is putting individual sounds together to form a whole word, e.g., /s/ /u/ /n/ blended into 'sun'. It is a synthesis task and is taught alongside segmenting for early decoding.

Praxis tip: Blending = put sounds together (synthesis); segmenting = pull them apart (analysis).

Example: A teacher says the sounds /b/ /a/ /t/ and the student responds 'bat'.

20 Phoneme Segmentation

Phoneme segmentation is breaking a spoken word into its individual sounds, e.g., 'fish' -> /f/ /i/ /sh/. It is an analysis task that supports spelling and decoding.

Praxis tip: Segmenting supports spelling; blending supports reading. Both are core phonemic-awareness drills.

Example: A student taps one finger per sound in 'stop': /s/ /t/ /o/ /p/ - four phonemes.

21 Onset and Rime

The onset is the initial consonant sound(s) of a syllable and the rime is the vowel plus everything after it: in 'stop', 'st' is the onset and 'op' is the rime. Teaching onset-rime helps students recognize word families.

Praxis tip: Onset = before the vowel; rime = vowel and after. Word families share a rime (cat, hat, bat).

Example: A lesson groups 'lake', 'make', 'take' by their shared rime '-ake'.

22 Decoding

Decoding is applying phonics knowledge to sound out and read unfamiliar words - translating print to speech. Fluent readers decode automatically, which frees attention for comprehension.

Praxis tip: Decoding failure is the classic blocker of comprehension - sound-it-out strategy questions point here.

Example: A student reads 'thunder' by sounding each syllable: th-un-der.

23 Orthographic Mapping

Orthographic mapping is the process by which readers permanently store the spelling, pronunciation, and meaning of a word in memory so it is recognized instantly. Each successful decoding of a word builds the map that turns it into a sight word.

Praxis tip: Orthographic mapping = how words become instantly recognized sight words through sound-spelling connections.

Example: After reading 'friend' several times with attention to its letters, the student recognizes it at a glance.

24 Sight Words / High-Frequency Words

Sight words are words recognized instantly without sounding out. Some are irregular (e.g., 'said', 'of', 'one'), and others become sight words through orthographic mapping. High-frequency words are the most common words in text, often including many irregular ones worth teaching as a set.

Praxis tip: Irregular high-frequency words (said, of, was) are taught 'by heart'; regular ones are still decoded first.

Example: A first grader reads 'the', 'and', 'said' instantly from a wall of high-frequency words.

25 Morphology

Morphology is the study of word parts that carry meaning: roots, prefixes, and suffixes. Morphological awareness helps students decode and understand longer words (e.g., 'un-help-ful') and supports vocabulary growth.

Praxis tip: Morphemes = smallest units of meaning; prefixes and suffixes change or add to a root word's meaning.

Example: Knowing 're-' means again and 'un-' means not lets a student infer 'rebuild' and 'unseen'.

26 Syllabication / Syllable Types

Syllabication is the ability to divide words into syllables, aided by knowledge of syllable types (closed, open, vowel-consonant-e, vowel team, r-controlled, consonant-le). Each type has a predictable vowel sound pattern that supports decoding multi-syllable words.

Praxis tip: Six syllable types: closed, open, silent-e, vowel team, r-controlled, consonant-le - the test loves them.

Example: In 'candle', the final syllable is consonant-le: 'can-dle', with the schwa before the l.

27 Digraphs, Blends & Trigraphs

A digraph is two letters making ONE new sound (sh, ch, th, wh); a trigraph is three letters making one sound (tch, dge). A consonant blend is two or more letters that keep their own sounds when combined (bl, str). Digraphs change the sound; blends just combine.

Praxis tip: Digraphs = new single sound (sh); blends = two sounds kept (st). This distinction is a favorite test item.

Example: 'ship' has a digraph (sh); 'stop' has a blend (st).

28 Vowel Teams & Diphthongs

Vowel teams are two vowels (or a vowel + w/y) that together make one vowel sound (ai, ea, oa, oi, aw). A diphthong is a gliding vowel sound within one syllable where the tongue moves between two positions (oy/oi, ow/ou as in 'coin', 'loud').

Praxis tip: Vowel teams = two letters one sound; diphthongs glide (oi, oy, ou, ow).

Example: 'boat' has the vowel team 'oa'; 'loud' has the diphthong 'ou'.

29 R-Controlled Vowels

R-controlled vowels occur when a vowel is followed by r, changing the vowel sound (ar, er, ir, or, ur) - the 'bossy r'. The vowel no longer says its usual short or long sound.

Praxis tip: Bossy r: ar, er, ir, or, ur all change the vowel sound - a classic phonics rule.

Example: In 'bird', the 'ir' makes the /er/ sound rather than a short i.

30 Silent E / Vowel-Consonant-E

The vowel-consonant-e (VCE) syllable pattern has a silent final e that makes the preceding vowel say its long name: 'cane', 'kite', 'hope'. Also called 'magic e' or 'split digraph'.

Praxis tip: Magic e: consonant + e after a vowel = long vowel sound (cap -> cape).

Example: Adding e to 'cap' changes it to 'cape' with a long a.

31 Fluency

Reading fluency is the ability to read text accurately, at an appropriate rate, and with proper expression (prosody). Fluency bridges word recognition and comprehension - the more fluent the reading, the more cognitive attention is free for meaning.

Praxis tip: Fluency = accuracy + rate + prosody. It is a bridge, not the goal itself - comprehension is the goal.

Example: A student reads a paragraph smoothly with phrasing and expression, without stopping to decode.

32 Comprehension

Reading comprehension is constructing meaning from text by integrating word reading with language comprehension, background knowledge, and reasoning. The Simple View says comprehension = decoding x language comprehension - both must be strong.

Praxis tip: Simple View of Reading: reading comprehension = decoding skill x language comprehension.

Example: A student decodes every word perfectly but cannot explain the paragraph because they lack background knowledge about the topic.

33 Vocabulary: The Three Tiers

Tier 1 words are everyday conversational words (happy, run). Tier 2 words are high-utility academic words found across subjects (analyze, compare, fortunate). Tier 3 words are content-specific technical terms (photosynthesis, hypotenuse). Tier 2 gets the most direct instruction.

Praxis tip: Tier 2 = high-utility academic words - the layer teachers should explicitly teach.

Example: Teaching 'evidence' and 'explain' helps students across reading, writing, and science.

34 Context Clues

Context clues are hints within surrounding text that reveal a word's meaning: definition, synonym, antonym, example, and inference clues. They support vocabulary growth but, per the Science of Reading, are a supplement - not a substitute - for phonics.

Praxis tip: Five clue types: definition, synonym, antonym, example, inference - match the clue to the strategy.

Example: An unknown word appears right after the phrase 'in other words' followed by a definition - a definition clue.

35 Graphophonemic, Semantic & Syntactic Cues

These are the three cueing systems readers can use: graphophonemic (letters and sounds), semantic (meaning from pictures/context), and syntactic (grammar and sentence structure). The Science of Reading de-emphasizes over-reliance on these cues in favor of phonics-first decoding.

Praxis tip: Know the three systems by name, and know that current research favors explicit phonics over cueing.

Example: A student stuck on 'bicycle' glances at a picture of a bike (semantic cue) instead of decoding - that is a cueing habit.

36 Scarborough's Reading Rope

Scarborough's Reading Rope models skilled reading as intertwined strands: word recognition (phonological awareness, decoding, sight recognition) twisted with language comprehension (background knowledge, vocabulary, language structures, verbal reasoning, literacy knowledge).

Praxis tip: The rope = word-recognition strands + language-comprehension strands; both must strengthen over time.

Example: A curriculum that builds vocabulary and background knowledge while teaching phonics is strengthening both rope strands.

37 Literary Genres

Literary genres are categories of literature: fiction (realistic, fantasy, science fiction, historical), traditional literature (folktales, fables, myths, legends, tall tales), poetry, drama, and nonfiction (biography, informational). Each has conventions students should recognize.

Praxis tip: Match genre to its purpose: fable = lesson, folktale = oral tradition, myth = explains the world, biography = a life.

Example: A story with animal characters that teaches a moral ('The Tortoise and the Hare') is a fable.

38 Story Elements

Story elements are the building blocks of narrative: plot (exposition, rising action, climax, falling action, resolution), character, setting, conflict, and theme. Questions ask students to identify each element in a passage.

Praxis tip: Plot arc: exposition -> rising action -> climax -> falling action -> resolution. Conflict drives the plot.

Example: The climax is the moment of greatest tension - the point where the character faces the central problem.

39 Characterization

Characterization is how authors reveal characters: direct (the narrator states traits) or indirect (inferred from speech, thoughts, actions, effects on others, and appearance). STEAL is the common mnemonic for indirect clues.

Praxis tip: STEAL: Speech, Thoughts, Effect on others, Actions, Looks - the five indirect characterization clues.

Example: You infer a character is kind because she shares her lunch and comforts a crying classmate.

40 Point of View

Point of view is the perspective from which a story is told: first person (I), second person (you), third person limited (one character's thoughts), third person omniscient (all characters' thoughts). Pronoun clues identify each.

Praxis tip: First person = I/we; third limited = he/she with ONE mind; third omniscient = all minds.

Example: A narrator who says 'I never knew what my brother was thinking' is first person.

41 Theme

The theme is the central message or lesson of a text - a statement about life, not a one-word topic. It is implied through characters, plot, and conflict; readers infer it rather than reading it stated directly.

Praxis tip: Theme = message (a sentence about life); topic = subject (one word). Keep the distinction.

Example: A story's topic is friendship; its theme is that true friends support each other through hard times.

42 Figurative Language

Figurative language departs from literal meaning for effect: simile (like/as), metaphor (is), personification (human qualities to non-human), hyperbole (exaggeration), idiom (non-literal phrase), alliteration, onomatopoeia, and imagery.

Praxis tip: Simile = like/as; metaphor = is/was; personification = human traits to objects; hyperbole = big exaggeration.

Example: 'The classroom was a zoo' is a metaphor; 'The wind whispered' is personification.

43 Poetry Elements

Poetry elements include stanza, line, rhyme scheme, rhythm/meter, sound devices (alliteration, assonance, consonance, onomatopoeia), and figurative language. Form types include haiku (5-7-5 syllables), limerick, free verse, and acrostic.

Praxis tip: Haiku = 5/7/5 syllables; free verse = no fixed meter or rhyme; stanzas are poetry's paragraphs.

Example: A three-line nature poem with a 5-7-5 syllable count is a haiku.

44 Text Structures

Informational text structures organize ideas: description, sequence/chronological, compare & contrast, cause & effect, and problem & solution. Identifying the structure helps readers predict and organize information.

Praxis tip: Five structures: description, sequence, compare/contrast, cause/effect, problem/solution - match signal words.

Example: 'Because', 'as a result', and 'therefore' signal cause and effect.

45 Main Idea & Supporting Details

The main idea is the central point of a text, often stated in a topic sentence and sometimes implied. Supporting details are the facts, examples, and reasons that explain or prove it.

Praxis tip: Ask 'What is this mostly about?' - the main idea, not a single detail, is the answer.

Example: A paragraph lists three reasons for recycling; the main idea is that recycling benefits the environment.

46 Author's Purpose

Author's purpose is why a text was written: to persuade, inform, entertain, explain, or describe (PIE or PIE'ED). Clues come from the genre, word choice, and text features.

Praxis tip: PIE: Persuade, Inform, Entertain (+ Explain, Describe). Ads persuade; textbooks inform.

Example: A commercial urging viewers to buy a toy is written to persuade.

47 Fact vs Opinion

A fact is a statement that can be proven true or false with evidence; an opinion is a personal belief or judgment that cannot be proven. Signal words like 'best', 'should', and 'probably' often mark opinions.

Praxis tip: Testable = fact; judgment with words like 'best' or 'should' = opinion.

Example: 'Earth is the third planet from the Sun' is a fact; 'It is the most beautiful planet' is an opinion.

48 Making Inferences

An inference is a conclusion drawn from text evidence combined with the reader's background knowledge - reading between the lines. It differs from a literal detail because it goes beyond what is directly stated.

Praxis tip: Inference = text clue + what you already know. The answer is NOT stated word-for-word in the text.

Example: A character grabs a coat and umbrella on the way out; you infer it looks rainy outside.

49 Summarizing

Summarizing is restating the most important ideas of a text in your own words, in a brief form, without personal opinions or minor details. It requires identifying the main ideas and their key support.

Praxis tip: A summary is short, in your own words, covers main ideas, and includes no opinions.

Example: A three-sentence summary of an article about the water cycle names evaporation, condensation, precipitation, and collection.

50 Text Features

Text features are the parts of informational text that support comprehension: headings, subheadings, table of contents, index, glossary, captions, diagrams, charts, maps, bold words, and sidebars. They help readers locate and understand information.

Praxis tip: Headings = sections; captions = explain pictures; glossary = definitions; index = where to find topics.

Example: Before reading, a student scans the headings and picture captions to predict what the article covers.

51 Citing Text Evidence

Citing evidence means locating and quoting the specific words, facts, or examples from a text that support a claim or answer. Strong answers name the evidence and explain how it connects to the claim.

Praxis tip: Evidence must be traceable to the text - quote or paraphrase it, then connect it to your answer.

Example: You answer 'How do we know? The passage says the trail was 'steep and rocky,' which explains why hikers turned back.'

52 Text-to-Self / Text-to-Text / Text-to-World

These are the three connection types readers make to deepen comprehension: text-to-self (personal experience), text-to-text (another book or text), and text-to-world (real-world events or knowledge).

Praxis tip: Self = your life; Text = another text; World = what happens in the world. Match the connection type.

Example: Reading about immigration, a student remembers their own family's move - a text-to-self connection.

53 The Writing Process

The writing process is the recursive sequence writers use: prewriting (brainstorm/plan), drafting, revising (improve ideas, organization, word choice), editing (fix conventions), and publishing. Revision changes what is said; editing fixes how it is said.

Praxis tip: Revising = improve content; editing = fix spelling/grammar. This distinction is a classic test item.

Example: A student adds a stronger topic sentence and moves a paragraph - that is revising, not editing.

54 Writing Modes

The three main writing modes taught in elementary school are narrative (tell a story), opinion/argumentative (take a stand with reasons), and informative/explanatory (explain facts and ideas). Each has a distinct purpose and structure.

Praxis tip: Narrative = story; opinion = persuade with reasons; informative = explain facts. Match the prompt to the mode.

Example: An essay titled 'Why Recess Should Be Longer' is opinion writing.

55 Narrative Writing

Narrative writing tells a story with a clear sequence of events, characters, a setting, and a plot that includes a problem and resolution. Strong narratives use sensory details, dialogue, and a consistent point of view.

Praxis tip: A narrative needs: characters, setting, plot with a problem and solution, and temporal words (first, next, finally).

Example: A student writes about the day their dog got lost, told in order with dialogue and feelings.

56 Opinion / Argumentative Writing

Opinion writing states a clear opinion and supports it with reasons and evidence, organized in an introduction, body paragraphs, and a conclusion. It anticipates and addresses the audience's questions.

Praxis tip: Structure = claim + reasons + evidence + conclusion. Counterarguments strengthen upper-grade essays.

Example: The essay opens 'Third graders deserve longer recess because...' and gives three supported reasons.

57 Informative / Explanatory Writing

Informative writing explains a topic using facts, definitions, details, and examples, organized with a clear introduction, body, and conclusion. It includes domain-specific vocabulary and text features where useful.

Praxis tip: Informative = teach the reader. Use facts and definitions, not opinions or persuasion.

Example: A report on the water cycle introduces each stage, defines key terms, and concludes with why it matters.

58 The Six Traits of Writing

The six traits are the qualities of strong writing: ideas, organization, voice, word choice, sentence fluency, and conventions. Teachers use them for instruction and rubric-based feedback.

Praxis tip: Six traits: ideas, organization, voice, word choice, sentence fluency, conventions - the mnemonic 'IOVWSC'.

Example: A rubric scores a paper on voice because the writing sounds like a real person talking to the reader.

59 Topic Sentence & Thesis

A topic sentence states the main point of a paragraph; a thesis statement states the main argument or focus of an entire essay. Both guide the reader and anchor the supporting details.

Praxis tip: Paragraph = topic sentence; essay = thesis. The thesis appears in the introduction and is the essay's spine.

Example: The essay 'Solar power is the best renewable source for our school' opens with that as its thesis.

60 Paragraph Structure

A well-developed paragraph has a topic sentence, supporting details (facts, examples, reasons), and a concluding or transitional sentence. It develops ONE main idea.

Praxis tip: One paragraph = one main idea: topic sentence -> support -> closing sentence.

Example: A paragraph about the water cycle starts with a topic sentence naming all four stages, then details each.

61 Transitions

Transitions are words and phrases that connect ideas and show relationships: sequence (first, next, finally), cause/effect (because, therefore), compare/contrast (however, similarly), and addition (also, moreover).

Praxis tip: Match the transition to the relationship: time order, cause, contrast, or addition.

Example: 'However' signals contrast between two paragraphs; 'as a result' signals cause and effect.

62 Research & Note-Taking

Research writing involves asking questions, finding credible sources, taking notes (in your own words), organizing information, and citing sources. Paraphrasing is restating an idea in your own words; plagiarism is using someone's words or ideas without credit.

Praxis tip: Paraphrase = your own words, still cite it; plagiarism = uncredited use - always attribute.

Example: A student reads two books about sharks, writes notes in their own words, and lists both books in a bibliography.

63 Editing Conventions

Editing is the final pass that corrects spelling, punctuation, capitalization, and grammar. Students should read their work aloud, use a checklist, and eventually use tools, but the responsibility for correctness is theirs.

Praxis tip: Edit for CUPS: Capitalization, Usage, Punctuation, Spelling.

Example: A student reads their draft aloud and catches a missing period and a misspelled 'because'.

64 Rubrics & Peer Feedback

A rubric is a scoring guide that defines levels of performance for each trait or criterion; peer feedback is structured review of a classmate's work against the rubric. Both make expectations visible and revision concrete.

Praxis tip: Rubrics name WHAT good writing looks like - teach students to self-check against them before submitting.

Example: Two students trade drafts, mark each other's rubric scores for 'ideas' and 'organization', and revise.

65 Parts of Speech

The eight parts of speech are noun, pronoun, verb, adjective, adverb, preposition, conjunction, and interjection. Each has a job in the sentence; the test asks students to identify them in context.

Praxis tip: Noun = person/place/thing/idea; verb = action/state; adjective modifies a noun; adverb modifies a verb/adjective.

Example: In 'The quick fox ran swiftly', 'quick' is an adjective and 'swiftly' is an adverb.

66 Subject-Verb Agreement

Subject-verb agreement means a singular subject takes a singular verb and a plural subject takes a plural verb. Intervening phrases and indefinite pronouns (everyone, each) are common traps.

Praxis tip: Ignore the words between subject and verb; 'everyone', 'each', and 'either' are singular.

Example: 'The box of toys IS in the closet' - the subject 'box' is singular, not 'toys'.

67 Pronoun-Antecedent Agreement

A pronoun must agree with its antecedent (the noun it replaces) in number and gender: 'The students brought THEIR books' (plural) vs 'The student brought HER book' (singular).

Praxis tip: Find the antecedent first, then check number and gender agreement.

Example: 'Each child raised HIS or HER hand' - 'each' is singular, so the pronoun must be singular.

68 Verb Tense Consistency

Verb tense consistency means keeping the same time frame within a passage unless the meaning requires a shift. Common errors mix past and present inappropriately.

Praxis tip: Pick the dominant tense of the passage and keep it; only shift when the timeline truly changes.

Example: In a past-tense story, 'She walked in and sees the mess' should be '...saw the mess'.

69 Sentence Types: Simple, Compound, Complex

A simple sentence has one independent clause; a compound sentence joins two with a conjunction and/or semicolon; a complex sentence has one independent clause plus a dependent clause introduced by a subordinator (because, when, although).

Praxis tip: Compound = two independent clauses; complex = one independent + one dependent clause.

Example: 'Because it rained, the game was canceled' is complex; 'It rained, and the game was canceled' is compound.

70 Sentence Fragments & Run-Ons

A fragment is an incomplete sentence missing a subject, verb, or complete thought. A run-on (including comma splice) joins independent clauses without proper punctuation or conjunction.

Praxis tip: Fix fragments by completing the thought; fix run-ons with a period, semicolon, or conjunction.

Example: 'Because I was late' is a fragment; 'The dog barked the cat ran' is a run-on needing a period or 'and'.

71 Punctuation: Commas, Apostrophes & Quotation Marks

Commas separate items, clauses, and introductory elements; apostrophes show possession (the dog's bone) and contractions (don't); quotation marks enclose dialogue and direct quotes.

Praxis tip: Apostrophe rules: possessive singular = 's'; plural possessive = s'; contractions drop letters.

Example: 'The students' books' (plural possessive) vs 'the student's book' (one student).

72 Capitalization Rules

Capitalize the first word of a sentence, the pronoun I, proper nouns and adjectives (names, places, days, months, languages, titles before names), and the first word of a quotation that is a complete sentence.

Praxis tip: Proper nouns = specific names; common nouns stay lowercase. Days and months are capitalized.

Example: 'We visited Grandma in March' - 'Grandma' used as a name is capitalized; 'my grandma' is not.

73 Homophones & Commonly Confused Words

Homophones are words that sound alike but differ in meaning/spelling (there/their/they're, to/too/two, its/it's). Commonly confused words are near-homophones (affect/effect, accept/except, then/than).

Praxis tip: Its = possessive; it's = it is. Their = possessive; there = place; they're = they are. Affect = verb, effect = noun.

Example: 'They're going to put their books over there' - all three forms used correctly.

74 Standard vs Nonstandard English

Standard English follows the conventions of formal written and academic language; nonstandard forms (ain't, double negatives, me and him went) are appropriate in informal speech but not formal writing.

Praxis tip: Spot and fix nonstandard forms: double negatives, 'me and X', 'ain't', 'could of'.

Example: 'I don't have no pencils' is a double negative; the standard form is 'I don't have any pencils'.

75 Collaborative Discussions

Collaborative discussions involve students building on each other's ideas: prepare by reading, follow agreed norms, pose and respond to questions, and connect comments to others' remarks.

Praxis tip: Good discussion skills = prepare + listen + build on others + ask clarifying questions.

Example: In a book club, a student says 'I agree with Maya, and it also reminds me of...' - building on a peer's idea.

76

Active Listening

Active listening means giving full attention, paraphrasing what the speaker said, asking clarifying questions, and responding thoughtfully rather than just waiting to talk. It includes nonverbal attention (facing the speaker, eye contact).

Praxis tip: Paraphrase + ask + respond = active listening; repeating the speaker's words shows you heard them.

Example: A student says 'So you're saying the main character felt left out - is that right?'

77

Presentation Skills

Effective presentations organize ideas clearly, speak audibly and at an appropriate pace, make eye contact, use visual aids that support (not crowd) the message, and respond to audience questions.

Praxis tip: Delivery = eye contact + pace + volume; visuals should support the main points, not replace them.

Example: A student gives a science report with a simple diagram and faces the class while speaking.

78

Asking & Answering Questions

Strong readers and speakers ask text-based questions (who, what, when, where, why, how) and answer with evidence. Question stems include literal, inferential, and evaluative levels.

Praxis tip: Literal = in the text; inferential = between the lines; evaluative = your judgment with evidence.

Example: 'What does the author say happened first?' is literal; 'Why did the character change?' is inferential.

79

Evaluating Media & Sources

Evaluating media means judging credibility, purpose, and bias of diverse media formats (video, websites, articles): who created it, why, when, and whether claims are supported by evidence.

Praxis tip: Source check: WHO made it, WHY, WHEN, and does the evidence hold up - bias and currency matter.

Example: A student compares two websites about dinosaurs and chooses the one from a museum, citing its authorship and sources.

80

Formal vs Informal Register

Register is the level of formality in language: formal (complete sentences, standard English, used for presentations and reports) vs informal (conversational, contractions, slang, used with friends).

Praxis tip: Match register to audience and purpose: reports and speeches = formal; casual conversation = informal.

Example: A student writes 'The experiment demonstrated that...' in a lab report but uses 'cool' chatting with a classmate.

PART 3: MATHEMATICS (5003)

~50-60 questions / 65 minutes. Numbers & operations, algebraic thinking, geometry & measurement, data/statistics & probability, and problem solving.

81 Place Value

Place value is the value of a digit based on its position in a number. In 4,572, the 4 is in the thousands place (4,000), the 5 in the hundreds, the 7 in the tens, and the 2 in the ones. It underlies comparing, rounding, and regrouping.

Praxis tip: Each place is 10x the place to its right; regrouping moves between places (10 ones = 1 ten).

Example: In 6,218, the digit 6 is worth 6,000 because it sits in the thousands place.

82 Whole-Number Operations

The four operations: addition (joining), subtraction (taking away or comparing), multiplication (equal groups / repeated addition), and division (sharing / repeated subtraction). Each has specific vocabulary: sum, difference, product, quotient.

Praxis tip: Sum = addition answer, difference = subtraction, product = multiplication, quotient = division.

Example: The product of 6 and 4 is 24; the quotient of 24 and 6 is 4.

83 Properties of Operations

Key properties: commutative ($a+b = b+a$; $a \times b = b \times a$), associative (grouping does not matter for + and $\times$), distributive ($a \times (b+c) = ab + ac$), identity (adding 0 or multiplying by 1), and zero property of multiplication ($\times 0 = 0$).

Praxis tip: Commutative = order; associative = grouping; distributive = multiplication over addition. Subtraction and division are NOT commutative.

Example: $3 \times (4 + 5) = 3 \times 4 + 3 \times 5 = 12 + 15 = 27$ - the distributive property.

84 Order of Operations

The order of operations is the agreed sequence for evaluating expressions: Parentheses/grouping, Exponents, Multiplication & Division (left to right), Addition & Subtraction (left to right) - remembered as PEMDAS.

Praxis tip: PEMDAS: do parentheses first, then exponents, then multiply/divide left to right, then add/subtract left to right.

Example: In $3 + 4 \times 2$, multiply first: $3 + 8 = 11$ (not 14).

85 Fractions: Equivalent & Comparing

Equivalent fractions name the same amount ($1/2 = 2/4 = 3/6$). Compare fractions by finding a common denominator, using cross-multiplication, or reasoning about the same whole. A fraction with equal numerator and denominator equals 1.

Praxis tip: To compare a/b and c/d , cross-multiply: $a \times d$ vs $c \times b$. Equivalent fractions = multiply or divide top and bottom by the same number.

Example: $3/4$ is greater than $2/3$ because $3 \times 3 = 9$ and $2 \times 4 = 8$; $9 > 8$.

86 Fraction Operations

Add/subtract fractions with a common denominator; multiply across numerators and denominators; divide by multiplying by the reciprocal (keep-change-flip). Simplify results to lowest terms.

Praxis tip: Add/subtract = common denominator; multiply = straight across; divide = keep-change-flip.

Example: $1/2 + 1/3 = 3/6 + 2/6 = 5/6$; $1/2 \times 3/4 = 3/8$; $(1/2)/(3/4) = 1/2 \times 4/3 = 2/3$.

87 Decimals

Decimals represent fractions with denominators of powers of 10: tenths, hundredths, thousandths. $0.5 = 5/10 = 1/2$; $0.25 = 25/100 = 1/4$. Compare by aligning place values; operations follow the same rules as whole numbers with the decimal point placed correctly.

Praxis tip: Align decimal points when adding/subtracting; a tenth = 0.1, a hundredth = 0.01.

Example: $0.6 + 0.07 = 0.67$ because 6 tenths plus 7 hundredths is 67 hundredths.

88 Percents

A percent is a ratio out of 100: $25\% = 25/100 = 0.25$. To find the percent of a number, convert the percent to a decimal and multiply (25% of $80 = 0.25 \times 80 = 20$). To convert a fraction to a percent, divide and multiply by 100.

Praxis tip: Percent = part per 100. 10% of $250 = 25$; move the decimal two places when converting % $\leftrightarrow$ decimal.

Example: A dress costs \$40; a 20% discount is $0.20 \times 40 = \$8$ off, so it sells for \$32.

89 Ratios & Proportions

A ratio compares two quantities ($3:2$ or $3/2$); a proportion states that two ratios are equal ($3/4 = 6/8$). Solve proportions by cross-multiplying. Unit rates compare a quantity to one unit (miles per hour, price per item).

Praxis tip: Proportion = two equal ratios; cross-multiply to solve for the missing term. Unit rate = per ONE.

Example: If 3 apples cost \$2.40, one apple is \$0.80; 5 apples cost \$4.00.

90 Integers & Absolute Value

Integers are whole numbers and their opposites ($\dots -2, -1, 0, 1, 2 \dots$). Absolute value is a number's distance from zero, always nonnegative. Adding integers uses sign rules; subtracting is adding the opposite.

Praxis tip: Absolute value = distance from zero ($|-5| = 5$). Adding same signs = add and keep; different signs = subtract and take the larger sign.

Example: $(-3) + (-4) = -7$; $(-7) - (-2) = -7 + 2 = -5$.

91 Prime & Composite Numbers

A prime number has exactly two factors: 1 and itself (2, 3, 5, 7, 11...). A composite number has more than two factors (4, 6, 8, 9, 10...). The number 1 is neither prime nor composite; 2 is the only even prime.

Praxis tip: Primes: 2, 3, 5, 7, 11, 13, 17, 19. 1 is NEITHER; 2 is the only even prime.

Example: 21 is composite because $21 = 3 \times 7$; 23 is prime because only 1 and 23 divide it.

92 Factors & Multiples (LCM/GCF)

Factors are numbers that multiply to make a target (factors of 12: 1, 2, 3, 4, 6, 12). Multiples are the target times counting numbers (multiples of 4: 4, 8, 12, 16...). GCF = greatest common factor; LCM = least common multiple.

Praxis tip: GCF = biggest factor both share; LCM = smallest multiple both share. List-and-compare or use prime factorization.

Example: GCF of 12 and 18 is 6; LCM of 4 and 6 is 12.

93 Rounding & Estimation

Rounding replaces a number with a nearby simpler value based on the digit in the next place (5 or greater rounds up). Estimation uses rounding, compatible numbers, or front-end strategies to check reasonableness quickly.

Praxis tip: Round to the underlined place; 5-9 rounds up, 0-4 stays. Estimation checks if an exact answer is reasonable.

Example: Round 347 to the nearest ten = 350; estimate $347 + 412 \sim 350 + 400 = 750$.

94 Exponents & Powers of 10

An exponent tells how many times to use the base as a factor: $3^2 = 9$, $2^3 = 8$. Powers of 10 follow the place-value pattern: $10^1 = 10$, $10^2 = 100$, $10^3 = 1000$; multiplying by a power of 10 moves the decimal point.

Praxis tip: Exponent = repeated multiplication. $10^3 = 1000$ (three zeros). Decimal moves right when multiplying by 10.

Example: $2.5 \times 100 = 250$ (decimal moves two places right); $7^2 = 49$.

95 Algebraic Expressions

An algebraic expression combines numbers, variables, and operations ($3x + 2$). A variable is a letter standing for an unknown or changing value. Evaluate an expression by substituting the given value for the variable.

Praxis tip: Evaluate = plug in the value and compute. Keep the order of operations when substituting.

Example: Evaluate $3x + 2$ for $x = 4$: $3(4) + 2 = 14$.

96 Equations & Inequalities

An equation states that two expressions are equal ($2x + 3 = 11$); an inequality compares with $<$, $>$, $\leq$ or $\geq$ ($2x + 3 > 11$). Solve by inverse operations - do the opposite to both sides to isolate the variable.

Praxis tip: Inverse operations undo: $+$ and $-$, $\times$ and $\div$. Whatever you do to one side, do to the other.

Example: $2x + 3 = 11 \rightarrow 2x = 8 \rightarrow x = 4$. Check: $2(4) + 3 = 11$.

97 One-Step & Two-Step Problems

Word problems translate into equations: 'a number increased by 5 is 12' $\rightarrow x + 5 = 12$. Identify the unknown, write the equation, solve with inverse operations, then check in the original situation.

Praxis tip: Translate words to symbols: 'more than' = $+$, 'times' = $\times$, 'is' = $=$, 'less than' flips the order.

Example: 'Three more than twice a number is 15' $\rightarrow 2x + 3 = 15 \rightarrow x = 6$.

98 Patterns & Sequences

Number patterns follow a rule (add 3, multiply by 2, powers). Shape patterns repeat visually. Identify the rule by examining consecutive terms, then extend the pattern and predict n th terms.

Praxis tip: Find the change between consecutive terms to spot the rule, then apply it consistently.

Example: 2, 6, 18, 54... follows 'multiply by 3'; the next term is 162.

99 Functions & Input-Output Tables

A function is a rule that assigns exactly one output to each input. Input-output tables show the pattern (input $\rightarrow$ output); describe the rule (output = input $\times 3 + 1$) and use it to find missing values.

Praxis tip: Function = one output per input. Find the rule by testing inputs against outputs in the table.

Example: In a table where $1 \rightarrow 4$, $2 \rightarrow 5$, $3 \rightarrow 6$, the rule is output = input + 3.

100 Coordinate Graphing

The coordinate plane has an x-axis (horizontal) and y-axis (vertical) crossing at the origin (0,0). Ordered pairs (x, y) locate points; the first number is horizontal, the second vertical. Quadrants I-IV go counterclockwise.

Praxis tip: Order matters: (x, y) - along the corridor first, then up the stairs. Origin = (0,0).

Example: The point (3, -2) is 3 right and 2 down from the origin, in Quadrant IV.

101 Slope & Linear Relationships

A linear relationship graphs as a straight line and has a constant rate of change (slope). Slope = rise/run = change in y / change in x. Equations like $y = mx + b$ show slope m and y-intercept b .

Praxis tip: Slope = rise over run; $y = mx + b$: m is the slope, b is where the line crosses the y-axis.

Example: In $y = 2x + 1$, the slope is 2 and the line crosses the y-axis at 1.

102 Proportional Relationships

Two quantities are proportional when their ratio stays constant (a direct proportion): as x doubles, y doubles. Graphs of proportional relationships pass through the origin; tables show a constant unit rate.

Praxis tip: Proportional = constant ratio + graph through (0,0); the unit rate is the constant of proportionality.

Example: At \$3 per pencil, 5 pencils cost \$15 and 10 cost \$30 - a proportional relationship.

103 Properties Applied to Equations

The properties of equality allow solving equations: adding, subtracting, multiplying, or dividing both sides by the same number keeps the equation balanced. The distributive property removes parentheses; combining like terms simplifies.

Praxis tip: Do the same to BOTH sides; combine like terms ($3x + 5x = 8x$) before isolating the variable.

Example: $3(x + 2) = 18 \rightarrow 3x + 6 = 18 \rightarrow 3x = 12 \rightarrow x = 4$.

104 Mathematical Reasoning & Justification

Reasoning in math means explaining WHY a strategy works, using models (number lines, area models, manipulatives), and justifying answers with precise vocabulary. Multiple correct strategies are acceptable when the reasoning is sound.

Praxis tip: Show the model and explain the steps in words - justify, don't just compute.

Example: A student proves $\frac{2}{3} > \frac{2}{5}$ by noting both have 2 parts but thirds are larger than fifths.

105 2D Shapes

Two-dimensional shapes include triangles, quadrilaterals (square, rectangle, rhombus, trapezoid, parallelogram), pentagons (5 sides), hexagons (6), and circles. They are classified by sides, angles, and lines of symmetry.

Praxis tip: Quadrilateral = 4 sides; a square is a rectangle, a rhombus, and a parallelogram all at once.

Example: A trapezoid has exactly one pair of parallel sides; a parallelogram has two pairs.

106 3D Shapes

Three-dimensional shapes include prisms, pyramids, cylinders, cones, and spheres. Key vocabulary: faces (flat surfaces), edges (where faces meet), vertices (corners), and bases. A cube has 6 faces, 12 edges, and 8 vertices.

Praxis tip: Count faces, edges, vertices carefully; a pyramid has one base and triangular faces meeting at one vertex.

Example: A rectangular prism has 6 faces and 12 edges; a cylinder has 2 faces and no vertices.

107 Angles

Angles are formed by two rays sharing a vertex and are measured in degrees: acute (<90), right ($=90$), obtuse (>90 and <180), straight ($=180$). Complementary angles sum to 90; supplementary angles sum to 180.

Praxis tip: Acute < 90 , right $= 90$, obtuse between 90 and 180, straight $= 180$. Complementary $= 90$, supplementary $= 180$.

Example: An angle of 35 degrees is acute; its complement is 55 degrees and its supplement is 145.

108 Lines & Rays

Lines extend forever in both directions; line segments have two endpoints; rays have one endpoint and extend forever one way. Parallel lines never meet; perpendicular lines meet at right angles; intersecting lines cross at any angle.

Praxis tip: Segment = two endpoints; ray = one endpoint; line = no endpoints. Parallel (||) vs perpendicular (symbol T).

Example: The tracks of a railroad are parallel; the corner of a book shows perpendicular lines.

109 Symmetry & Transformations

A figure has line symmetry if it can be folded so the halves match (the fold is the line of symmetry). Transformations move figures: translation (slide), rotation (turn), reflection (flip), and dilation (size change).

Praxis tip: Translation = slide; rotation = turn; reflection = flip. Line symmetry = fold-and-match.

Example: A butterfly has one vertical line of symmetry; sliding a triangle 3 units right is a translation.

110 Perimeter & Area

Perimeter is the distance around a shape (sum of side lengths); area is the amount of surface covered, in square units. Rectangle area = length $\times$ width; square = side $\times$ side; triangle = $\frac{1}{2} \times$ base $\times$ height; parallelogram = base $\times$ height.

Praxis tip: Perimeter = around (linear units); area = cover (square units). Rectangle: $A = l \times w$, $P = 2(l + w)$.

Example: A 5-ft by 3-ft rug has area 15 sq ft and perimeter 16 ft.

111 Volume & Surface Area

Volume is the space inside a 3D figure, in cubic units: rectangular prism $V = l \times w \times h$ (or base $\times$ height). Surface area is the total area of all faces, in square units.

Praxis tip: Volume = cubic units ($l \times w \times h$); surface area = sum of all face areas (square units).

Example: A box $4 \times 3 \times 2$ has volume 24 cubic units and surface area $2(12 + 8 + 6) = 52$ sq units.

112 Measurement Units & Conversions

Customary units: 12 in = 1 ft, 3 ft = 1 yd, 5,280 ft = 1 mi; 16 oz = 1 lb; 2 cups = 1 pt, 2 pt = 1 qt, 4 qt = 1 gal. Metric: 1,000 mm = 1 m, 100 cm = 1 m, 1,000 m = 1 km; 1,000 g = 1 kg; 1,000 mL = 1 L.

Praxis tip: Metric prefixes: kilo = 1000, centi = 1/100, milli = 1/1000. Memorize the 12-inch foot and 5280-foot mile.

Example: 48 inches = 4 feet; 2.5 km = 2,500 m; 3 quarts = 6 pints.

113 Elapsed Time & Money

Elapsed time is the duration between start and end times (use a number line or clock: 2:15 to 3:45 = 1 hour 30 minutes). Money problems use decimal dollars and cents: 100 cents = 1 dollar.

Praxis tip: Count elapsed time in hops (hours then minutes) on a clock number line.

Example: A movie starts at 1:50 and ends at 3:20 - that is 1 hour 30 minutes.

114 Units of Area & Irregular Figures

Irregular figures' area can be found by decomposing into familiar rectangles/triangles, computing each part, and adding. Always state the unit: square inches, square meters, etc.

Praxis tip: Decompose-and-add: split irregular shapes into rectangles and triangles, then sum the areas.

Example: An L-shaped room splits into a 4x5 rectangle (20 sq ft) and a 2x3 rectangle (6 sq ft); total 26 sq ft.

115 Angle Measurement

Angles are measured with a protractor in degrees. A straight line is 180 degrees; a full rotation is 360; the angles of a triangle sum to 180; a quadrilateral's sum to 360.

Praxis tip: Triangle angles sum to 180; quadrilateral to 360. A protractor lines up one ray with 0.

Example: If two angles of a triangle are 50 and 60, the third is 70 (180 - 110).

116 Scale & Maps

Scale shows the ratio between a drawing/map and real size: a scale of 1 inch : 10 miles means 3 inches on the map = 30 miles. Set up a proportion to convert.

Praxis tip: Scale problems = proportions: drawing measure x scale factor = real measure.

Example: On a 1:100 floor plan, a 4-cm wall is really 400 cm (4 m).

117 Picture Graphs & Bar Graphs

Picture graphs use symbols to represent counts (each symbol = 2 votes); bar graphs use bar lengths to compare categories. Read scales, keys, and labels carefully.

Praxis tip: Check the KEY first - one picture symbol may equal 2, 5, or 10 items.

Example: A bar graph with a scale of 2 shows a bar at 5, meaning a count of 10.

118 Line Plots & Frequency Tables

A line plot shows data points along a number line with X's to record frequency - ideal for small data sets. A frequency table lists categories with their counts.

Praxis tip: In a line plot, each X is one observation; count X's above a value for its frequency.

Example: A line plot of shoe sizes shows 4 X's above size 7 - four students wear size 7.

119 Mean, Median, Mode & Range

Mean = sum divided by count (the average). Median = middle value when data is ordered (average the two middles for even counts).

Mode = most frequent value. Range = maximum - minimum.

Praxis tip: Mean = average; median = middle (order first!); mode = most; range = max - min. Median ignores outliers; mean does not.

Example: Data 4, 6, 6, 8, 11: mean = 7, median = 6, mode = 6, range = 7.

120 Data Interpretation

Interpreting data means reading values, comparing categories, finding changes over time (from line graphs), and drawing conclusions with evidence from the data - not from assumptions.

Praxis tip: Read axes + scale + title first, then compare specific values, then conclude.

Example: A line graph of temperature Monday-Friday descends Tuesday through Thursday - a cooling trend.

121 Probability Basics

Probability measures the chance an event occurs, from 0 (impossible) to 1 (certain), often written as a fraction, decimal, or percent.

Probability = favorable outcomes / total possible outcomes.

Praxis tip: Probability = favorable/total. $\frac{1}{4}$ can also be written 0.25 or 25%.

Example: Rolling a 3 on a fair six-sided die has probability $\frac{1}{6}$.

122 Combinations & Counting Outcomes

Counting outcomes: if one choice has m options and another has n , there are $m \times n$ combinations (the multiplication principle). Tree diagrams organize all possibilities.

Praxis tip: Multiply the number of options at each stage to count total outcomes.

Example: Choosing a shirt (4) and pants (3) gives $4 \times 3 = 12$ outfits.

123 Predictions from Data

Predictions use patterns in collected data: a sample's proportion is applied to a larger population (60% of 200 = 120), or a trend in a graph is extended forward. Predictions are estimates, not certainties.

Praxis tip: Apply the sample proportion to the whole population: part/whole = sample proportion.

Example: In a survey, 9 of 50 students prefer blue; predict about 180 of 1000 will choose blue (18%).

124 Sampling & Fair Representation

A good sample represents the population it describes - random selection and adequate size reduce bias. Convenience samples (asking only friends) are biased; conclusions should match the population sampled.

Praxis tip: Random + representative = fair sample; results only generalize to the population sampled.

Example: Asking only morning students about lunch preferences under-samples afternoon students - biased.

125 Multi-Step Word Problems

Multi-step problems require more than one operation, often with hidden questions and extra information. Solve by: read, identify the unknown, plan the steps, compute, check reasonableness in the original context.

Praxis tip: Underline the question first, cross out irrelevant numbers, then plan TWO or more operations.

Example: Buy 3 shirts at \$12 each with a \$5 coupon: $3 \times 12 = 36$, $36 - 5 = \$31$.

126 Estimation & Reasonableness

Estimating before computing (rounding, compatible numbers) and checking that the exact answer is close and sensible prevents careless errors. Ask: does my answer make sense for the situation?

Praxis tip: Round first, compute, then compare - the estimate is your reasonableness check.

Example: $317 \times 4 \sim 300 \times 4 = 1,200$; the exact answer 1,268 is in the right ballpark.

127 Math Vocabulary & Problem Language

Key words map to operations: 'total', 'sum', 'altogether' = addition; 'difference', 'left', 'fewer' = subtraction; 'times', 'product', 'each' = multiplication; 'shared equally', 'per' = division. But context matters more than keywords.

Praxis tip: Keywords hint, but read the situation - 'more' can mean subtraction in comparison problems.

Example: 'How many more books does Ana have than Ben?' is a subtraction comparison, not addition.

128

Test-Taking Math Strategies

Strategies for the math subtest: work carefully in the on-screen calculator's scratch area or provided paper, check units and decimal placement, substitute answer choices back into equations, and skip-and-return to hard items to protect time.

Praxis tip: Plug answer choices back into the equation; mark items to revisit; watch time per question (~65-78 seconds).

Example: Unsure of $8 \times 7/2$? Try 28 in the original problem to confirm it fits.

PART 4: SOCIAL STUDIES (5004)

~60 questions / 60 minutes. US history, world history, government & civics, geography, and economics.

129

Native American Cultures

Before European contact, diverse Indigenous peoples inhabited every region of the Americas with distinct cultures, languages, housing, and economies: e.g., Pueblo peoples of the Southwest, Plains nations, Eastern Woodlands (Iroquois), Pacific Northwest tribes.

Praxis tip: Match region to culture: Southwest = pueblos/adobe, Plains = buffalo nomads, Woodlands = longhouses/farming.

Example: The Iroquois Confederacy of the Northeast united five (later six) nations under a council.

130

European Exploration & Colonization

15th-17th century European exploration sought trade routes and resources; Spain, France, England, and the Netherlands colonized the Americas. Columbus (1492) opened sustained contact; the Columbian Exchange then moved plants, animals, diseases, and people between hemispheres.

Praxis tip: Columbian Exchange = goods AND disease across the Atlantic - a big transfer with huge consequences.

Example: Europeans gained corn and potatoes; the Americas gained horses and wheat; disease devastated Indigenous populations.

131

The 13 Colonies

Thirteen English colonies clustered in three regions: New England (fishing, shipbuilding, town meetings), Middle (wheat, diverse peoples, toleration - Pennsylvania), and Southern (plantation agriculture, cash crops like tobacco and rice, reliance on enslaved labor).

Praxis tip: New England = trade/fishing; Middle = grains; Southern = cash crops + slavery. Match region to economy.

Example: Virginia's tobacco economy drove its labor demand; Massachusetts' rocky soil favored fishing and trade.

132

The American Revolution

Growing colonial grievances over taxation without representation (Stamp Act, Townshend Acts, Tea Act) led to protest, the Intolerable Acts, and armed conflict (Lexington/Concord 1775). The Declaration of Independence (1776) asserted natural rights and listed grievances; the war ended with the Treaty of Paris (1783).

Praxis tip: Know the timeline: taxes -> protests -> war -> Declaration 1776 -> victory/Treaty of Paris 1783.

Example: The Boston Tea Party responded to the Tea Act; the Declaration's core idea is that governments derive power from consent.

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The Declaration of Independence

Written mainly by Thomas Jefferson (1776), the Declaration states that all people have unalienable rights (life, liberty, pursuit of happiness), that governments derive their power from the consent of the governed, and lists colonial grievances against King George III.

Praxis tip: Unalienable rights: life, liberty, pursuit of happiness; consent of the governed = key philosophy.

Example: The Declaration justifies revolution because the king broke the social contract with the colonists.

134

The Constitution & Its Principles

The U.S. Constitution (ratified 1788) created the framework of government with seven articles and key principles: popular sovereignty (the people rule), limited government, separation of powers, checks and balances, and federalism (power shared between national and state governments).

Praxis tip: Seven articles set up the three branches; principles = sovereignty, limited gov, separation, checks/balances, federalism.

Example: Article I creates Congress, Article II the presidency, Article III the courts.

135

The Bill of Rights

The first ten amendments protect individual liberties from government overreach: 1st (speech, religion, press, assembly, petition), 2nd (bear arms), 3rd (quartering), 4th (search/seizure), 5th (due process, self-incrimination), 6th (fair trial), 8th (cruel/unusual punishment).

Praxis tip: Memorize the big four: 1st freedoms, 4th search, 5th due process, 6th trial rights.

Example: The 1st amendment protects a newspaper article criticizing the government - freedom of the press.

136 Westward Expansion

The 1800s brought rapid westward growth: the Louisiana Purchase (1803) doubled the nation; Lewis & Clark explored; Manifest Destiny justified expansion; the Oregon Trail, California Gold Rush, and railroads pushed settlement; the Mexican-American War added the Southwest.

Praxis tip: Louisiana Purchase 1803 = huge territory from France; Manifest Destiny = 'obvious fate' to expand to the Pacific.

Example: The 1849 Gold Rush drew thousands to California, accelerating statehood in 1850.

137 The Civil War

Secession over slavery and states' rights split the Union (1861). The Union (North) fought the Confederacy (South); key events include Fort Sumter, the Emancipation Proclamation (1863), Gettysburg (1863), and the surrender at Appomattox (1865) after Lincoln's re-election.

Praxis tip: Emancipation Proclamation freed enslaved people in rebel states; Gettysburg = turning point; Appomattox = end.

Example: Lincoln's Gettysburg Address reframed the war as a test of whether a nation 'conceived in liberty' could endure.

138 Reconstruction

Reconstruction (1865-1877) rebuilt the South after the Civil War: the 13th Amendment abolished slavery, the 14th granted citizenship and equal protection, the 15th protected Black men's right to vote. Jim Crow segregation and sharecropping replaced slavery in practice.

Praxis tip: 13th = abolish slavery; 14th = citizenship/equal protection; 15th = Black men vote. Know them in order.

Example: The 14th Amendment's equal-protection clause later anchored the civil rights movement.

139 Industrialization & Immigration

Late 19th-century industrialization (steel, railroads, oil, electricity - Carnegie, Rockefeller, Edison, Ford) transformed the economy; millions of immigrants (Ellis Island) and rural migrants filled factory jobs; labor unions (AFL) organized for better conditions.

Praxis tip: Industrialization = big business + machines; immigration spiked through Ellis Island (east) and Angel Island (west).

Example: Henry Ford's assembly line made cars affordable; unions won the 8-hour day and safer conditions.

140 The Great Depression & New Deal

The stock market crash (1929) began the Great Depression - bank failures, unemployment near 25%, Dust Bowl droughts. FDR's New Deal (1933+) created relief, recovery, and reform programs: Social Security, WPA jobs, FDIC bank insurance.

Praxis tip: New Deal = FDR's response; Social Security = retirement safety net; FDIC = bank deposit insurance.

Example: The Dust Bowl pushed Plains farmers to California, a story in Steinbeck's 'The Grapes of Wrath'.

141 World War II & the Home Front

After Pearl Harbor (1941) the U.S. entered WWII; the Allies (U.S., Britain, USSR) defeated the Axis (Germany, Italy, Japan). The war ended with VE Day (May 1945) and VJ Day (Sept 1945) after the atomic bombs. The home front mobilized industry and rationing; Japanese Americans were interned.

Praxis tip: Pearl Harbor = U.S. entry (Dec 7, 1941); VE Day = Europe; VJ Day = Japan; internment = civil-liberties failure.

Example: Women worked in factories (Rosie the Riveter); Japanese Americans faced forced internment camps.

142 The Civil Rights Movement

The mid-20th-century movement ended legal segregation and discrimination: Brown v. Board of Education (1954) struck down school segregation; Rosa Parks and the Montgomery bus boycott; MLK Jr.'s nonviolent marches and 'I Have a Dream' (1963); the Civil Rights Act (1964) and Voting Rights Act (1965).

Praxis tip: Brown 1954 = desegregate schools; Civil Rights Act 1964 = end discrimination; Voting Rights Act 1965 = protect the vote.

Example: The 1963 March on Washington pressed Congress, leading to the 1964 Civil Rights Act.

143 Ancient Civilizations

Early river-valley civilizations: Mesopotamia (Tigris/Euphrates - writing, Hammurabi's Code), Egypt (Nile - pharaohs, pyramids, hieroglyphics), Indus Valley, and China (Huang He). Each developed cities, writing, and organized government.

Praxis tip: River valleys = first civilizations: Mesopotamia = writing + laws; Egypt = Nile + pyramids.

Example: Hammurabi's Code from Mesopotamia is one of the earliest written law codes.

144 Ancient Greece & Rome

Greece contributed democracy (Athens), philosophy (Socrates, Plato, Aristotle), and the Olympics. Rome built a republic with a Senate, expanded an empire, spread Latin and roads, and its legal tradition influenced modern law; Rome fell in 476 CE.

Praxis tip: Athens = democracy; Rome = republic + law; Greek philosophy and Roman law are the lasting legacies.

Example: The U.S. Constitution borrowed the idea of a senate and representative government from Rome.

145 The Middle Ages

Medieval Europe (roughly 500-1500 CE) featured feudalism (kings, lords, vassals, serfs), manors, castles, the Catholic Church's central role, and the Crusades. The Black Death (1340s) killed a third of Europe and reshaped labor and society.

Praxis tip: Feudalism = land-for-service pyramid; the Church unified medieval life; Black Death transformed labor.

Example: A vassal pledges military service to a lord in exchange for land (a fief).

146 The Renaissance & Reformation

The Renaissance (1300s-1600s) revived classical learning and art (da Vinci, Michelangelo, Shakespeare) and humanism, beginning in Italy. The Reformation (1517+, Luther's 95 Theses) split Western Christianity into Catholic and Protestant branches.

Praxis tip: Renaissance = rebirth of classical learning/humanism; Reformation = Luther + Protestant split.

Example: Gutenberg's printing press spread Renaissance and Reformation ideas rapidly across Europe.

147 The Age of Exploration

European monarchs sponsored voyages for trade, gold, and empire: Portugal (da Gama), Spain (Columbus, Magellan), later England, France, Netherlands. Global trade networks grew; the transatlantic slave trade devastated Africa; colonization reshaped the Americas.

Praxis tip: Motives = God, gold, glory; Magellan's crew first to circumnavigate; the slave trade was brutally global.

Example: Columbus's 1492 voyage began sustained European contact with the Americas.

148 World Wars & Modern Global History

WWI (1914-1918, Allies vs Central Powers) led to the League of Nations. WWII (1939-1945) led to the United Nations. The Cold War (1947-1991) pitted the U.S. (democracy/capitalism) against the USSR (communism) in a nuclear standoff, ending with the USSR's collapse.

Praxis tip: WWI -> League of Nations; WWII -> United Nations; Cold War = U.S. vs USSR, ends 1991.

Example: The Berlin Wall (1961-1989) symbolized the Cold War division of Europe.

149 The Three Branches

The Constitution creates three branches: the LEGISLATIVE branch (Congress - House and Senate) makes laws; the EXECUTIVE branch (President, Vice President, Cabinet) enforces laws; the JUDICIAL branch (Supreme Court and federal courts) interprets laws.

Praxis tip: Laws: Congress makes, President enforces, Courts interpret. Article I = Congress, II = President, III = Courts.

Example: A bill becomes law when both houses pass it and the President signs it (or overrides a veto).

150 Checks & Balances

Checks and balances let each branch limit the others: the President vetoes laws, Congress overrides vetoes and approves appointments/budget, and the Supreme Court can declare laws unconstitutional (judicial review, Marbury v. Madison 1803).

Praxis tip: Veto = executive check on legislature; override = legislative check; judicial review = court check on both.

Example: The Senate rejects a President's Supreme Court nominee - the legislature checking the executive.

151 Federalism & Levels of Government

Federalism divides power between national and state governments: the national government handles defense, currency, and foreign policy; states handle education, driver's licenses, and most local law; local governments (cities/counties) manage services like police, fire, and schools.

Praxis tip: National = defense/currency/foreign; state = education/licensing; local = police/fire/schools.

Example: Setting the school calendar is a local/state matter; printing money is a national matter.

152 Rights & Responsibilities of Citizens

Citizens have rights (free speech, voting, fair trial) and responsibilities (obey laws, pay taxes, serve on juries, participate in civic life, respect others' rights). Voting is both a right and a responsibility of democratic citizenship.

Praxis tip: Rights = protections; responsibilities = duties: jury duty, taxes, obeying laws, informed voting.

Example: Serving on a jury when summoned is a civic responsibility; free speech is a right.

153 The Amendment Process

The Constitution can be amended: an amendment is proposed by 2/3 of both houses of Congress (or a convention requested by 2/3 of states) and ratified by 3/4 of state legislatures (or conventions). The Bill of Rights is the first ten amendments.

Praxis tip: Proposal = 2/3 Congress; ratification = 3/4 of states. This is intentionally hard.

Example: The 26th Amendment (18-year-old vote) took the same two-step route as all others.

154 How a Bill Becomes a Law

A bill: introduced in Congress -> committee review -> floor debate and vote in both houses -> conference to reconcile differences -> President signs, vetoes, or lets it pass (10 days) -> Congress can override a veto with 2/3 of both houses.

Praxis tip: Track the steps: introduce, committee, both-house vote, conference, President, possible override.

Example: Both houses pass slightly different versions; a conference committee merges them before the President sees it.

155 Political Parties & Elections

Political parties nominate candidates and organize voters around platforms. Elections select officeholders (local, state, national); primaries choose party nominees; the general election decides winners; the Electoral College formally elects the President.

Praxis tip: Primary = choose the party's nominee; general = choose the winner; Electoral College = 538 electors, 270 to win.

Example: A voter participates in a primary to pick their party's candidate for governor.

156 The Rule of Law

The rule of law means everyone - citizens and government officials alike - must follow the law; no one is above it. It protects fairness, due process, and equal treatment under the law.

Praxis tip: No one is above the law, including leaders; due process = fair treatment through the legal system.

Example: A court rules that a city must follow its own zoning law - the rule of law applied to government.

157 Citizenship & Naturalization

U.S. citizens are born citizens (birthright) or naturalized citizens. Naturalization requires lawful permanent residence, good moral character, English ability, civics knowledge, and an oath of allegiance. Non-citizens have most legal rights but not voting or jury duty.

Praxis tip: Birthright OR naturalization; naturalization = residency + English + civics test + oath.

Example: A green-card holder passes the civics test and takes the oath to become a naturalized citizen.

158 Civic Participation & Community

Civic participation means engaging with community and government: voting, volunteering, attending town meetings, contacting representatives, writing to officials, and staying informed. It is how citizens influence public decisions.

Praxis tip: Voice channels: vote, serve, attend, volunteer, write - each is a form of civic participation.

Example: A family attends the town budget meeting to speak about park funding.

159 Maps & Map Elements

Maps have a title, legend/key, scale, compass rose, and grid. Types include political maps (boundaries, cities), physical maps (landforms, elevation), and thematic maps (climate, population, resources).

Praxis tip: Read the legend and scale first; political = boundaries, physical = landforms, thematic = one topic.

Example: A map showing state borders is political; one showing rainfall amounts is thematic.

160 Hemispheres, Continents & Oceans

The equator divides Northern/Southern hemispheres; the prime meridian divides Eastern/Western. Seven continents (North America, South America, Europe, Asia, Africa, Australia, Antarctica) and five oceans (Pacific, Atlantic, Indian, Arctic, Southern) make up the global geography.

Praxis tip: Equator = north/south; prime meridian = east/west. Seven continents, five oceans.

Example: Africa straddles the equator; the Pacific is the largest ocean.

161 Landforms & Water Features

Landforms include mountains, plains, plateaus, valleys, hills, and deserts; water features include oceans, seas, lakes, rivers, tributaries, and deltas. Each affects settlement, agriculture, and transportation.

Praxis tip: Match landform to description: plateau = flat highland; delta = river mouth deposit; plain = flat lowland.

Example: Fertile plains and river deltas historically attracted farming settlements.

162 Climate & Vegetation Regions

Climate is long-term weather patterns (tropical, arid, temperate, polar); vegetation regions (rainforest, desert, grassland, tundra, forest) follow climate. Latitude, elevation, and nearness to water shape climate.

Praxis tip: Climate = long-term; weather = day-to-day. Near water = moderate temperatures; high elevation = cooler.

Example: Tropical rainforests near the equator are hot and wet year-round; deserts are dry due to sinking air.

163 Human-Environment Interaction

People adapt to environments (irrigation in dry lands, dams for flood control) and modify them (farming, cities, mining), which can create positive outcomes and environmental problems (pollution, deforestation, climate change).

Praxis tip: Adapt = fit the environment (irrigation); modify = change it (dams); both have trade-offs.

Example: Building terraces on hillsides lets farmers grow crops on slopes - adapting and modifying.

164 Natural Resources

Natural resources are materials from the earth: renewable (sun, wind, water, forests, soil - can replenish) and nonrenewable (coal, oil, natural gas, minerals - finite). Resource distribution shapes economies and trade.

Praxis tip: Renewable = replenishes (solar, wind, water); nonrenewable = finite (fossil fuels, minerals).

Example: Saudi Arabia's economy centers on oil (nonrenewable); Denmark invests in wind power (renewable).

165 Population & Settlement

Population distribution concentrates where resources, climate, water, and jobs support people; most humans live in temperate zones near coasts and rivers. Population density = people per unit of land area.

Praxis tip: Density = people / area; settlement clusters near water, arable land, and opportunity.

Example: Northeast China and the U.S. East Coast are dense; deserts and polar regions are sparse.

166 Global Interdependence

Globalization links countries through trade, communication, migration, and culture: goods and services cross borders, multinational companies operate worldwide, and events in one country ripple through others.

Praxis tip: Interdependence = countries rely on each other for goods, information, and labor.

Example: A factory closure in one country raises prices in another - linked economies.

167 Scarcity & Choice

Scarcity means unlimited wants but limited resources; every choice has a cost. Economics studies how people and societies decide what to produce, how to produce it, and who gets it.

Praxis tip: Scarcity forces choice; every choice has an opportunity cost (the next best thing given up).

Example: A student chooses a study hour over a game - the game is the opportunity cost.

168 Supply & Demand

Demand = how much buyers want at each price; supply = how much sellers offer at each price. When demand rises or supply falls, price tends to rise; when supply rises or demand falls, price tends to fall.

Praxis tip: Up demand / down supply = higher price; down demand / up supply = lower price.

Example: A new must-have toy sells out - high demand and low supply push the price up.

169 Producers, Consumers & Markets

Producers make and sell goods or services; consumers buy them. Markets are where buyers and sellers interact. Goods are physical items (shoes); services are actions (haircuts).

Praxis tip: Producers = make/sell; consumers = buy; goods = things; services = actions.

Example: A bakery (producer) sells bread (good) to customers (consumers).

170 Money, Banking & Trade

Money serves as a medium of exchange, a store of value, and a unit of account. Banks accept deposits and make loans; trade lets regions specialize and exchange what they produce efficiently (imports/exports).

Praxis tip: Money = medium of exchange + store of value; banks = deposits and loans; trade = specialization + exchange.

Example: The U.S. exports soybeans and imports coffee - trade based on specialization.

171 Taxes & Public Goods

Governments collect taxes (income, sales, property) to pay for public goods and services everyone shares: roads, schools, defense, parks, police. Public goods are typically not provided efficiently by markets alone.

Praxis tip: Taxes fund shared services; public goods = non-excludable (roads, defense, clean air).

Example: Your state's sales tax pays for public schools and highways.

172 Economic Systems

Economic systems answer what/how/for whom to produce differently: market (prices and choices - capitalism), command (government decides - communism), traditional (custom and habit), and mixed (mostly market with government regulation - the U.S.).

Praxis tip: Market = prices/choice; command = government decides; mixed = market + regulation (U.S.).

Example: The U.S. is a mixed economy: private businesses plus government safety-net programs.

PART 5: SCIENCE (5005)

~55 questions / 60 minutes. Life science, earth & space science, physical science, and science practices & engineering.

173 Cells: The Basic Unit of Life

All living things are made of cells. Plant cells have a cell wall, chloroplasts, and a large central vacuole; animal cells have neither a wall nor chloroplasts but both have a nucleus, cytoplasm, and cell membrane.

Praxis tip: Plant = wall + chloroplasts + big vacuole; animal = membrane only. Find the wall to identify plant cells.

Example: Only a plant cell shows chloroplasts performing photosynthesis.

174 Photosynthesis & Cellular Respiration

Photosynthesis (in chloroplasts) turns light, water, and carbon dioxide into glucose and oxygen: $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$. Cellular respiration (in mitochondria) turns glucose and oxygen into energy (ATP), water, and carbon dioxide - the reverse cycle.

Praxis tip: Photosynthesis = $\text{CO}_2 + \text{water} + \text{light} \rightarrow \text{glucose} + \text{O}_2$; respiration = $\text{glucose} + \text{O}_2 \rightarrow \text{CO}_2 + \text{water} + \text{energy}$.

Example: Plants make glucose by day (photosynthesis) and release energy from it around the clock (respiration).

175 Ecosystems & Habitats

An ecosystem includes living (biotic) things and nonliving (abiotic) parts of an environment interacting: organisms, populations, communities, and the physical setting. A habitat is the specific place an organism lives within an ecosystem.

Praxis tip: Ecosystem = living + nonliving together; habitat = an organism's home within it.

Example: A pond ecosystem includes fish and plants (biotic) plus water, sunlight, and minerals (abiotic).

176 Food Chains & Food Webs

A food chain traces energy: producer $\rightarrow$ consumer (primary, secondary, tertiary) $\rightarrow$ decomposer. A food web is many interlocking chains. Energy decreases at each trophic level (about 10% moves up); arrows point in the DIRECTION OF ENERGY FLOW.

Praxis tip: Arrows point TO the eater (energy flow). Producers = plants; decomposers recycle matter.

Example: Sun $\rightarrow$ grass $\rightarrow$ rabbit $\rightarrow$ fox: the arrow from grass points to the rabbit that eats it.

177 Energy Pyramid & Trophic Levels

An energy pyramid shows energy decreasing at each level: producers at the base (most energy), then primary, secondary, and tertiary consumers (least). Matter cycles (water, carbon, nitrogen) while energy flows one way.

Praxis tip: Energy flows one way and shrinks up the pyramid; matter cycles through ecosystems.

Example: Top predators carry the least energy because ~90% is lost at each step.

178 Adaptations

Adaptations are inherited traits that help organisms survive and reproduce in their environment: structural (webbed feet, thick fur), behavioral (migration, hibernation), and physiological (camouflage, venom).

Praxis tip: Structural = body part; behavioral = action; physiological = internal process.

Example: A polar bear's thick fur and blubber are structural adaptations to the cold.

179 Life Cycles

Life cycles describe growth and reproduction: complete metamorphosis (egg $\rightarrow$ larva $\rightarrow$ pupa $\rightarrow$ adult, e.g., butterfly), incomplete metamorphosis (egg $\rightarrow$ nymph $\rightarrow$ adult, e.g., grasshopper), and simple cycles (mammals: birth $\rightarrow$ growth $\rightarrow$ reproduction).

Praxis tip: Butterfly = complete (4 stages); grasshopper = incomplete (3 stages); mammals = grow then reproduce.

Example: A caterpillar forms a chrysalis (pupa) before emerging as an adult butterfly.

180 Classification of Organisms

Living things are classified by shared characteristics: Domain $\rightarrow$ Kingdom $\rightarrow$ Phylum $\rightarrow$ Class $\rightarrow$ Order $\rightarrow$ Family $\rightarrow$ Genus $\rightarrow$ Species. The kingdoms include animals, plants, fungi, protists, and bacteria (monera/archaea).

Praxis tip: Order from big to small: Kingdom-Phylum-Class-Order-Family-Genus-Species (KPCOFGS).

Example: Humans are Homo sapiens: genus Homo, species sapiens - the two-part scientific name.

181 Human Body Systems

Key systems: circulatory (heart, blood, vessels - transport), respiratory (lungs - gas exchange), digestive (break down food), skeletal (support), muscular (movement), nervous (control, brain/spine/nerves), excretory (waste - kidneys). They work together.

Praxis tip: Transport = circulatory; gas exchange = respiratory; control = nervous; movement = skeletal + muscular.

Example: Oxygen enters the lungs (respiratory) and is carried by blood (circulatory) to muscles (muscular).

182 Heredity & Traits

Traits are passed from parents to offspring through genes (units of heredity on chromosomes). Dominant alleles mask recessive ones; offspring inherit one allele from each parent. Learned behaviors are NOT inherited.

Praxis tip: Genes = heredity units; dominant masks recessive; learned behaviors are not genetic.

Example: A child with brown hair (dominant B) from a Bb mother and bb father gets B from mom and b from dad - brown hair.

183 Plant Structures & Functions

Plant parts: roots (absorb water/minerals, anchor), stem (transport, support), leaves (photosynthesis), flowers (reproduction), seeds (dispersal/next generation). Each structure is adapted to its function.

Praxis tip: Roots = absorb/anchor; stem = transport; leaves = photosynthesis; flower = reproduction.

Example: A cactus's thick stem stores water and its spines reduce water loss.

184 Interdependence of Organisms

Organisms depend on each other: predation, competition, mutualism (both benefit), commensalism (one benefits, other unaffected), parasitism (one harmed, one benefits). Decomposers return nutrients to soil.

Praxis tip: Symbiosis types: mutualism +/+; commensalism +/-; parasitism +/-.

Example: A bee pollinates a flower and gets nectar - mutualism (both benefit).

185 Biodiversity & Extinction

Biodiversity is the variety of life in an ecosystem; it makes ecosystems resilient. Habitat loss, pollution, invasive species, and climate change reduce biodiversity and can cause extinction; conservation protects species and habitats.

Praxis tip: Biodiversity = variety = resilience; invasive species and habitat loss threaten it.

Example: Restoring wetlands brings back native birds - conservation boosts biodiversity.

186 Health & Nutrition Basics

Health concepts include balanced nutrition (carbohydrates, proteins, fats, vitamins, minerals), exercise, hygiene, and disease prevention. A balanced diet supports growth, immune function, and energy.

Praxis tip: Macronutrients = carbs, proteins, fats; micronutrients = vitamins and minerals.

Example: Whole grains, proteins, and vegetables at each meal provide a balanced nutrient mix.

187 Earth's Layers

Earth's layers from outside in: crust (thin solid shell), mantle (thick, hot rock that flows slowly), outer core (liquid iron/nickel), inner core (solid iron/nickel, extremely hot). Plate tectonics moves the crust.

Praxis tip: Crust -> mantle -> outer core (liquid) -> inner core (solid). Think of an egg: shell, white, yolk.

Example: Earthquakes and volcanoes cluster at plate boundaries where crustal plates meet.

188 Rocks & Minerals

Minerals are naturally occurring solids with a definite chemical structure (tested by hardness, luster, streak, color). Rocks are made of minerals and fall into three types: igneous (cooled magma/lava), sedimentary (layered, compressed - fossils live here), metamorphic (changed by heat/pressure).

Praxis tip: Igneous = cooled melt; sedimentary = layered (fossils); metamorphic = changed by heat/pressure.

Example: Granite is igneous; sandstone is sedimentary; marble (from limestone) is metamorphic.

189 The Rock Cycle

The rock cycle shows rocks changing type over time: weathering/erosion -> sediment -> compaction = sedimentary; heat/pressure = metamorphic; melting -> magma -> cooling = igneous. It never stops and has no fixed order.

Praxis tip: Sediments -> (compact) sedimentary; heat/pressure -> metamorphic; melt -> cool = igneous.

Example: An igneous rock erodes into sand, which compacts into sandstone, which heat turns to quartzite.

190 Weathering & Erosion

Weathering breaks rock into pieces (physical: freezing/thawing, plant roots; chemical: acid rain, oxidation). Erosion moves the pieces (water, wind, ice, gravity). Deposition drops them somewhere new, building deltas and dunes.

Praxis tip: Weathering = break down; erosion = move away; deposition = drop off.

Example: A river carries sand downstream (erosion) and drops it at its mouth, forming a delta (deposition).

191 The Water Cycle

The water cycle moves water between atmosphere, land, and oceans: evaporation (liquid -> vapor), condensation (vapor -> clouds), precipitation (rain/snow), and collection/runoff (into lakes, rivers, oceans). Transpiration adds water vapor from plants.

Praxis tip: Evaporation up, condensation clouds, precipitation down, collection/runoff to water bodies.

Example: Sun heats a puddle; vapor rises, cools into clouds, and falls again as rain - the cycle repeats.

192 Weather vs Climate

Weather is day-to-day atmospheric conditions (temperature, precipitation, wind); climate is long-term patterns (30+ years). Weather is short-term and variable; climate is the average and drives regional biomes.

Praxis tip: Weather = now; climate = long-term average. 'Rainy today' = weather; 'desert = dry' = climate.

Example: A snowstorm in Chicago is weather; Chicago's cold winters are climate.

193 The Seasons

Seasons result from Earth's axial TILT (23.5 degrees) as it orbits the Sun - not distance from the Sun. When the Northern Hemisphere tilts toward the Sun it is summer there (more direct sunlight, longer days); six months later it tilts away (winter).

Praxis tip: Tilt, not distance, causes seasons; the hemisphere tilted TOWARD the Sun has summer.

Example: In December, the Southern Hemisphere tilts toward the Sun - it is summer in Australia.

194 The Solar System

The solar system: the Sun (a star) at the center, eight planets (Mercury, Venus, Earth, Mars - rocky; Jupiter, Saturn, Uranus, Neptune - gas/ice giants), moons, asteroids, comets. Planets orbit the Sun in ellipses; inner planets are rocky, outer are gas giants.

Praxis tip: Order: My Very Educated Mother Just Served Us Noodles (Mercury..Neptune). Inner = rocky, outer = gas.

Example: Jupiter is the largest planet; Mars is called the Red Planet for its iron-oxide surface.

195 Moon Phases & Tides

Moon phases cycle as the Moon orbits Earth: new, waxing crescent, first quarter, waxing gibbous, full, waning gibbous, third quarter, waning crescent. Tides are caused mainly by the Moon's gravity (with the Sun adding); spring tides (higher) occur at new/full moons.

Praxis tip: Phases follow the Moon's orbit; the Moon's gravity drives tides; spring tides = new/full moon.

Example: At a full moon, the Sun, Earth, and Moon align, producing extra-high spring tides.

196 Day & Night / Earth's Rotation

Earth's rotation on its axis (once every ~24 hours) causes day and night and the apparent motion of the Sun across the sky. Earth's orbit around the Sun (once per year) combined with the tilt causes the seasons.

Praxis tip: Rotation = spin (day/night); revolution = orbit (year). The Sun appears to move because Earth rotates.

Example: It is daytime in the U.S. when that hemisphere faces the Sun; the opposite side is in night.

197 Natural Resources & Conservation

Earth provides renewable (sun, wind, water, forests) and nonrenewable (fossil fuels, minerals) resources. Conservation reduces waste, protects habitats, and sustains resources: reduce, reuse, recycle, protect waterways.

Praxis tip: Renewable replenishes (solar/wind/water); nonrenewable is finite (coal, oil); conservation sustains both.

Example: Switching a school to solar panels reduces reliance on nonrenewable energy.

198 Fossils & Evidence of Change

Fossils are preserved remains or traces of ancient life (bones, shells, imprints) found mainly in SEDIMENTARY rock. They provide evidence of evolution, past environments, and continental change over millions of years.

Praxis tip: Fossils = sedimentary rock; they record life history and past environments.

Example: Marine fossils high in the Himalayas show that region was once under the sea.

199 Matter & Its States

Matter is anything with mass and volume, made of atoms. The three common states: solid (fixed shape/volume), liquid (fixed volume, takes container's shape), gas (fills its container). Heating/cooling changes states: melting, freezing, evaporation, condensation.

Praxis tip: Solid → liquid = melting; liquid → gas = evaporation; reverse = freezing/condensation.

Example: Ice melting to water is melting (solid to liquid); steam condensing on a mirror is condensation.

200 Physical vs Chemical Change

A physical change alters form but not substance (tearing paper, melting ice, dissolving) and is usually reversible. A chemical change creates a NEW substance (burning, rusting, baking) with signs like color change, gas, heat/light, or a new odor.

Praxis tip: Reversible form change = physical; new substance created = chemical (burn, rust, cook).

Example: Burning wood produces ash and smoke - a chemical change; cutting the wood is physical.

201 Mixtures & Solutions

A mixture combines substances that keep their properties and can be separated physically (trail mix, sand and water). A solution is a uniform mixture where one substance dissolves in another (salt water); the solute dissolves in the solvent.

Praxis tip: Mixture = separable parts; solution = uniform dissolve (solute in solvent); filtering separates by size.

Example: Salt dissolves into water as a solution; you can filter sand out of water but not dissolved salt.

202 Forms of Energy

Energy forms: mechanical (motion), thermal (heat), electrical, light (radiant), sound, chemical (stored in bonds), and nuclear. Energy can transform from one form to another (kinetic ↔ potential), but it is conserved - never created or destroyed.

Praxis tip: Energy transforms and is conserved; potential = stored, kinetic = moving.

Example: A lamp converts electrical energy into light and heat; a battery stores chemical energy.

203 Energy Transfer & Heat

Heat moves from warmer to cooler objects by conduction (contact - metal spoon in hot soup), convection (fluids circulate - boiling water), and radiation (electromagnetic waves - sun's warmth).

Praxis tip: Conduction = contact; convection = fluid circulation; radiation = waves through space.

Example: A hot mug warms your hands through conduction; warm air rises in a room by convection.

204 Light

Light travels in straight lines, reflects off surfaces (mirrors), refracts (bends) when changing media (prisms, water), and can be absorbed (dark surfaces heat up). White light splits into the color spectrum (ROYGBIV).

Praxis tip: Reflection = bounce; refraction = bend; absorption = take in; ROYGBIV = white light spectrum.

Example: A straw looks bent in a glass of water because light refracts entering the water.

205 Sound

Sound is a vibration traveling as a wave through a medium (solid, liquid, gas) - it cannot travel through empty space. Pitch depends on frequency (high frequency = high pitch); loudness depends on amplitude.

Praxis tip: Sound needs a medium; pitch = frequency; loudness = amplitude. No sound in a vacuum.

Example: A drum's tight head produces a higher pitch; hitting harder increases loudness (amplitude).

206 Forces: Gravity, Friction & Magnetism

A force is a push or pull. Gravity pulls objects toward Earth's center (weight = mass x gravity). Friction opposes motion between surfaces (slows a sliding box). Magnetism attracts iron and has north/south poles - opposites attract.

Praxis tip: Gravity = down; friction = opposes motion; magnets: like poles repel, opposites attract.

Example: A ball rolls to a stop because friction opposes its motion; it falls because gravity pulls it.

207 Motion & Speed

Motion is a change in position over time. Speed = distance / time (miles per hour, meters per second). Velocity adds direction; acceleration is a change in speed or direction.

Praxis tip: Speed = distance/time; acceleration = change in speed or direction.

Example: A car driving 60 miles in 1 hour travels at 60 mph; turning a corner at constant speed still accelerates (direction change).

208 Simple Machines

Simple machines make work easier by changing the amount, direction, or distance of force: lever, pulley, wheel and axle, inclined plane, wedge, and screw. Mechanical advantage multiplies force.

Praxis tip: Six simple machines: lever, pulley, wheel-axle, inclined plane, wedge, screw.

Example: A ramp (inclined plane) lets you move a heavy box up with less force over a longer distance.

209 Electricity & Circuits

Electricity is the flow of electric charge. A circuit needs a power source, conductors (wire), a load (bulb/motor), and a complete loop; a switch opens/closes the loop. Conductors (metals) allow flow; insulators (rubber, plastic) block it.

Praxis tip: Closed circuit = flows; open = stops. Conductors = metals; insulators = rubber/plastic.

Example: Turning off a light switch opens the circuit and the bulb goes dark; a blown wire breaks the loop.

210 Magnetism & Electromagnets

Magnets have two poles and a magnetic field; Earth itself acts as a giant magnet (compass needles point north). An electromagnet forms when electricity flows through a wire coil around iron - its strength grows with more coils or current.

Praxis tip: Earth = giant magnet; electromagnet = electricity + coil; more coils/current = stronger magnet.

Example: Scrapyards use giant electromagnets: current on lifts scrap steel, current off drops it.

211 The Scientific Method

The scientific method is a cyclical process: ask a question -> research -> form a hypothesis (testable prediction) -> experiment -> analyze data -> draw conclusions -> communicate. Results sometimes lead to new questions.

Praxis tip: Hypothesis = testable prediction ('If... then... because...'); the cycle repeats after conclusions.

Example: 'If plants get more light, then they will grow taller' is a testable hypothesis.

212 Observations vs Inferences

An observation is information gathered with the senses or tools (the liquid is blue and bubbling). An inference is a reasoned conclusion from observations (a chemical reaction is occurring). Observations are factual; inferences are interpretive.

Praxis tip: Observation = what you sense; inference = what you conclude from it.

Example: You OBSERVE wet pavement and an open umbrella; you INFER it rained recently.

213 Variables in Experiments

In a fair experiment, the independent variable is what you change, the dependent variable is what you measure (it depends on the change), and controlled variables stay the same. Only ONE independent variable at a time keeps the test fair.

Praxis tip: Independent = changed; dependent = measured; controlled = kept same. Change one thing to test its effect.

Example: Testing fertilizer amounts: fertilizer dose is independent, plant height is dependent, light/water are controlled.

214 Measurement & Units

Scientists use metric units: length in meters (m), mass in grams (g) or kilograms (kg), volume in liters (L) or cubic meters, temperature in degrees Celsius (C). Tools: ruler, balance/scale, graduated cylinder, thermometer.

Praxis tip: Metric: m, g, L, C. Graduated cylinder = liquid volume; balance = mass; thermometer = temperature.

Example: Measure 25 mL of water with a graduated cylinder, reading the bottom of the meniscus.

215 Data: Tables, Charts & Graphs

Scientific data is organized into tables and displayed as bar graphs (categories), line graphs (change over time), or pie charts (parts of a whole). Read axes, labels, and trends before drawing conclusions.

Praxis tip: Line graph = change over time; bar graph = compare categories; always read axes and units first.

Example: A line graph of plant height over 4 weeks shows steady growth - the variable relationship.

216 The Engineering Design Process

Engineering design solves problems iteratively: ask/define the problem -> imagine/brainstorm solutions -> plan -> create a prototype -> test and evaluate -> improve and repeat. It mirrors the scientific method but produces solutions (designs), not just explanations.

Praxis tip: Design loop: ask, imagine, plan, create, test, improve - prototypes get iterated.

Example: Students build a paper tower, test it, observe it collapsing, and redesign with a wider base - improving the prototype.

PART 6: FINAL REVIEW - THE HIGHEST-YIELD ITEMS TO DRILL

The rapid-review pass: one line per concept that summarizes the single most answerable point.

217 Reading: The Five Pillars

Phonemic awareness, phonics, fluency, vocabulary, comprehension - the Science of Reading pillars. Know them in order and what each means.

Praxis tip: Ask which pillar: sounds = phonemic, letters-sounds = phonics, speed+accuracy = fluency, meaning of words = vocabulary, understanding text = comprehension.

Example: A question about sounding out words tests phonics; one about blending spoken sounds tests phonemic awareness.

218 Reading: Blending vs Segmenting

Blending puts sounds together to read; segmenting pulls them apart to spell.

Praxis tip: Blending = read (synthesis); segmenting = spell (analysis).

Example: /b/ /a/ /t/ -> bat is blending; bat -> /b/ /a/ /t/ is segmenting.

219 Reading: Simple View

Reading comprehension = decoding x language comprehension. Weak decoding caps comprehension regardless of language skill.

Praxis tip: Both factors must be strong - poor decoding always limits comprehension.

Example: A child with great spoken vocabulary still cannot understand text because decoding is slow.

220 Reading: Theme vs Topic

Topic is the subject (one word); theme is the message (a sentence about life).

Praxis tip: Theme = lesson/message; topic = subject. Themes are implied, not stated as a single word.

Example: Topic = friendship; theme = true friends support each other in hard times.

221 Writing: Revising vs Editing

Revising improves content (ideas, organization, word choice); editing fixes conventions (spelling, punctuation, grammar).

Praxis tip: Revise = what you say; edit = how you say it. The test loves this distinction.

Example: Moving a paragraph = revising; fixing a comma = editing.

222 Writing: The Three Modes

Narrative tells a story; opinion takes a stand with reasons; informative explains facts.

Praxis tip: Story = narrative; persuade = opinion; explain = informative. Match the prompt.

Example: 'Why Our School Needs a Garden' is opinion writing.

223 Grammar: Subject-Verb Agreement

Singular subjects take singular verbs; plural take plural. Ignore intervening phrases.

Praxis tip: Find the true subject, skip the middle words, then match the verb.

Example: 'The box of toys IS heavy' - box (singular) takes 'is', not 'are'.

224 Grammar: Its vs It's

Its = possessive; it's = it is.

Praxis tip: 'It's' always means 'it is'; if you cannot say 'it is', use 'its'.

Example: The dog wagged ITS tail; IT'S a friendly dog.

225 Math: PEMDAS

Parentheses, Exponents, Multiply/Divide (left to right), Add/Subtract (left to right).

Praxis tip: Multiply/divide and add/subtract are equal-rank, done left to right.

Example: In $6 / 2 \times 3$, divide first then multiply: $3 \times 3 = 9$.

226 Math: Mean, Median, Mode, Range

Mean = average; median = middle (order first); mode = most frequent; range = max - min.

Praxis tip: Median requires ordering the data; range is spread; mode is the repeat.

Example: For 2, 4, 4, 6, 9: mean 5, median 4, mode 4, range 7.

227 Math: Probability

Probability = favorable outcomes / total possible outcomes, 0 to 1.

Praxis tip: Write it as a fraction and reduce; 'certain' = 1, 'impossible' = 0.

Example: Drawing a red card from a standard deck: $26/52 = 1/2$.

228 Math: Area vs Volume

Area covers 2D surfaces in square units; volume fills 3D space in cubic units.

Praxis tip: Area = flat (sq units); volume = space (cubic units): $V = l \times w \times h$.

Example: A 3x4x5 box has volume 60 cubic units; its 3x4 face has area 12 square units.

229 Social Studies: The Three Branches

Congress makes laws, the President enforces them, the courts interpret them.

Praxis tip: Make = Congress; enforce = President; interpret = Courts.

Example: A court rules a law unconstitutional - the judicial branch checking the legislature.

230 Social Studies: Amendments 13-15

13th abolished slavery; 14th granted citizenship and equal protection; 15th protected Black men's right to vote.

Praxis tip: 13 = no slavery; 14 = citizen/equal; 15 = vote. In order after the Civil War.

Example: Reconstruction amendments: 13, 14, 15 - abolish, protect, enfranchise.

231 Social Studies: Supply & Demand

Rising demand or falling supply raises price; rising supply or falling demand lowers it.

Praxis tip: Scarcity up = price up; abundance up = price down.

Example: A drought shrinks the orange crop - supply falls, prices rise.

232 Social Studies: Causes of Seasons

Earth's axial tilt (not distance) causes seasons; the tilted-toward-Sun hemisphere has summer.

Praxis tip: Tilt = seasons; the hemisphere leaning toward the Sun gets summer.

Example: June = summer in the Northern Hemisphere because it tilts toward the Sun.

233 Science: Photosynthesis vs Respiration

Photosynthesis makes glucose + oxygen from light, water, CO₂; respiration releases energy from glucose + oxygen.

Praxis tip: Photosynthesis = builds (needs light); respiration = releases (needs glucose + O₂).

Example: Plants photosynthesize in light and respire around the clock.

234 Science: Three Rock Types

Igneous = cooled magma/lava; sedimentary = layered/compacted (fossils); metamorphic = changed by heat/pressure.

Praxis tip: Igneous = from fire; sedimentary = settled layers; metamorphic = transformed.

Example: Fossils are found in sedimentary rock.

235 Science: Changes of State

Melt = solid to liquid; freeze = liquid to solid; evaporate = liquid to gas; condense = gas to liquid.

Praxis tip: Heat in = melt/evaporate; heat out = freeze/condense.

Example: Morning dew on grass is condensation - water vapor becoming liquid.

236

Science: Conductors vs Insulators

Conductors (metals) let electricity/heat flow; insulators (rubber, plastic, wood) block flow.

Praxis tip: Metals conduct; rubber/plastic insulate.

Example: Wires are copper (conductor) wrapped in plastic (insulator).

237

Science: Independent vs Dependent Variable

Independent = what you change; dependent = what you measure; controlled = kept the same.

Praxis tip: The dependent variable **DEPENDS** on the independent one.

Example: Testing light on growth: light = independent, growth = dependent, water = controlled.

PART 7: TEST-DAY STRATEGY

The 5001 is a 245-question, 4h35m marathon. Protect the clock, protect your stamina, and protect the subtest order.

238 Before the Appointment

Confirm your registration, your state's required test code (5001 vs 8002-8006 or 7001), your test center, and the exact passing scores. Bring a current, government-issued photo ID; arrive early; know the center's personal-item rules.

Praxis tip: ID + code + passing scores + center = the four pre-test checks. Re-verify the code one week out.

Example: You confirm your state still lists 5001 (not 8003) the week before registering.

239 Pace: 245 Questions, 4h35m

The combined test runs about one question per minute across four separately-timed subtests: 5002 has 90 minutes for ~80 questions (~67 sec each), 5003 has 65 for ~50-60, 5004 has 60 for ~60, 5005 has 60 for ~55.

Praxis tip: Know each subtest's per-question budget: ~60-78 seconds depending on the subtest. Check the timer per subtest.

Example: In the 90-minute Reading subtest, be near question 40 at minute 45.

240 Subtest Order & Transitions

The four subtests run in order (5002, 5003, 5004, 5005) with each timed separately. Use the transitions between subtests to reset: stretch, breathe, and shift your mindset to the next subject.

Praxis tip: Treat each subtest as a fresh exam - do not carry frustration from the last one into the next.

Example: After a hard Math subtest, you take a breath and restart fresh for Social Studies.

241 Use the Flag-and-Return Feature

Within a subtest you can mark questions and return to them before time expires. Flag the uncertain ones, answer anyway (no penalty for guessing), and revisit flagged items in leftover time.

Praxis tip: Always put an answer down before flagging - a guessed answer can only help; a blank cannot.

Example: You flag question 17, answer C, and return to it with 6 minutes left in the subtest.

242 On-Screen Tools & Scratch Paper

The Mathematics subtest provides an on-screen calculator; all subtests provide scratch paper and a marker/eraser at the testing station. Use scratch paper for math work, notes, and staying organized.

Praxis tip: Do algebra and tracking on paper first, then enter the final step in the calculator.

Example: You sketch a number line for the elapsed-time problem before entering the answer.

243 No Guessing Penalty - Answer Everything

Selected-response questions carry no penalty for wrong answers, so never skip an item. Eliminate wrong options first, then choose the best remaining answer; a strategic guess beats a blank every time.

Praxis tip: Eliminate 1-2 options, then guess from what remains; blanks are the only guaranteed misses.

Example: Unsure between B and D on a science item, you pick D and flag it for review.

244 Stamina & Breaks

4h35m of testing is a marathon. The computer-delivered format includes scheduled breaks between subtests - use them to hydrate, stretch, and clear your mind. Practice full-length timing runs so test day is not a surprise.

Praxis tip: Practice one full four-subtest run before test day - stamina is trainable.

Example: Between subtests you stand, stretch, and take a few slow breaths before the next section.

245 State Cut Scores - Know Your Targets

Passing scores are set per state and commonly fall in the 155-159 range (often the 157/157/155/159 pattern). Know YOUR state's numbers for each subtest so you know what the target is while you take it.

Praxis tip: Aim 3-5 points ABOVE your state's cut on every subtest - the practical margin for a safe pass.

Example: Your state requires 157 Math; you treat 160 as your working target.

246

Score Reporting & Retakes

Unofficial scores typically show immediately on screen; official scores post to your ETS account and are sent to your selected state/agency. If you miss one subtest, you retake only that subtest after the 28-day wait.

Praxis tip: Read the on-screen preliminary scores, then confirm your state's passing numbers before celebrating or rebooking.

Example: You pass three subtests but miss Science - you register for 5005 alone in 28 days.

247

During the Test: Decision Habits

Read each question fully, watch for EXCEPT/NOT (the test uses negative stems), check units and decimal places in math, and trust the content knowledge you drilled. One hard question is one item out of 245 - move on and reset.

Praxis tip: Circle/note NOT and EXCEPT stems; a single hard item should cost you at most ~90 seconds.

Example: A question asks 'which is NOT a short vowel?' - you catch the NOT and pick the long-vowel option.

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