

**TEXES® Core Subjects EC–6
Curriculum Crosswalk**

Required Course Numbers											
Test Content Categories											
Subject I – English Language Arts and Reading (901)											
Competency 001 (Oral Language): <i>The teacher understands the importance of oral language, knows the developmental processes of oral language, and provides students with varied opportunities to develop listening and speaking skills.</i>											
A. Knows and teaches basic linguistic concepts and the developmental stages in the acquisition of oral language—including phonology, semantics, syntax (subject-verb agreement and subject-verb inversion), and pragmatics—as appropriate for students in grades 4–6 and recognizes that individual variations occur within and across languages.											
B. Plans and implements systematic oral language instruction based on informal and formal assessment of all students, including English learners; fosters oral language development; and addresses students' individual needs, strengths, and interests in grades 4–6.											
C. Designs a variety of one-on-one and group activities (e.g., having discussions, questioning, sharing information) to build on students' current oral language skills.											

Required Course Numbers

Test Content Categories											
D. Selects and uses instructional materials and strategies for students in grades 4–6 that respond to students' individual needs, strengths, and interests; reflect cultural diversity; and build on students' cultural, linguistic, and home backgrounds to enhance their oral language development.											
E. Provides instruction that interrelates oral and written language to promote students' reading and writing proficiencies.											
F. Selects and uses instructional strategies, materials, activities, and models to teach students in grades 4–6 skills for speaking to various audiences for various purposes and for adapting spoken language for various audiences, purposes, and occasions.											
G. Selects and uses instructional strategies, materials, activities, and models to teach students listening skills for various purposes (e.g., critical listening to evaluate a speaker's message, listening to enjoy and appreciate spoken language) and provides students with opportunities to engage in active, purposeful listening in a variety of contexts.											
H. Selects and uses instructional strategies, materials, activities, and models to teach students in grades 4–6 to evaluate the content and effectiveness of their own spoken messages and the messages of others.											

Required Course Numbers											
Test Content Categories											
Competency 002 (Word Analysis and Identification Skills): <i>The teacher understands the importance of word analysis and identification skills for reading comprehension and provides many opportunities for students to practice and improve these skills.</i>											
A. Uses a variety of instructional approaches and materials to promote students' phonetic, graphophonemic, and morphophonemic knowledge as outlined in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.											
B. Understands the importance of word recognition skills (e.g., structural analysis, identifying and reading high-frequency words from a research-based list, contextual analysis) for reading comprehension and knows a variety of strategies for helping students in grades 4–6 develop and apply word analysis skills, including identifying, categorizing, and using common synonyms, antonyms, homographs, homophones, and analogies.											
C. Selects and uses instructional strategies, materials, activities, and models to teach students in grades 4–6 to read high-frequency words, to promote the students' ability to decode increasingly complex words, and to enhance word identification skills of students who read at varying levels.											
D. Knows and teaches strategies for decoding increasingly complex words, including advanced vowel-sound combinations, structural or morphological elements (e.g., prefixes, suffixes, roots, base words), and syllable types and syllable division patterns, and for using syntax and semantics to support word identification and confirm word meaning for students in grades 4–6.											

Required Course Numbers

Test Content Categories											
E. Understands the value of using dictionaries, glossaries, and other sources to determine the meanings, usage, pronunciations, correct spelling, and derivations of unfamiliar words and teaches students in grades 4–6 how to use these sources.											
F. Understands how to foster collaboration with families and with other professionals to promote all students' skills in word analysis and identification.											
Competency 003 (Reading Fluency): <i>The teacher understands the importance of fluency for reading comprehension and provides many opportunities for students to improve their reading fluency.</i>											
A. Knows the relationship between reading fluency and comprehension for students in grades 4–6.											
B. Understands that fluency involves rate, accuracy, prosody, and intonation and knows the norms for reading fluency that have been established by the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.											
C. Understands the connection of word identification skills and reading fluency to reading comprehension for students in grades 4–6.											
D. Understands differences in students' development of word identification skills and reading fluency and knows instructional practices for meeting students' individual needs in those areas for students in grades 4–6.											
E. Selects and uses instructional strategies, materials, and activities to develop and improve fluency for students in grades 4–6.											

Required Course Numbers											
Test Content Categories											
F. Knows how to teach students in grades 4–6 strategies for reading books independently, including the use of technology to support grade-level content.											
G. Provides students with opportunities to engage in silent reading and extended reading of a wide range of materials, including informational texts and texts from various literary genres, as outlined in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.											
H. Uses strategies to encourage reading for pleasure and lifelong learning.											
I. Recognizes the interrelationship between reading fluency and the other components of reading for students in grades 4–6.											
J. Understands how to foster collaboration with families and with other professionals to promote all students' reading fluency in grades 4–6.											
Competency 004 (Reading Comprehension and Applications): <i>The teacher understands the importance of reading for understanding, knows the components and processes of reading comprehension, and teaches students strategies for improving their comprehension, including using a variety of texts and contexts.</i>											
A. Understands factors affecting reading comprehension (e.g., word analysis skills, prior knowledge, language background/experience, previous reading experiences, fluency, vocabulary development, ability to monitor understanding, characteristics of specific texts) for students in grades 4–6.											

Required Course Numbers											
Test Content Categories											
B. Understands levels of reading comprehension and knows how to model and teach skills for literal comprehension (e.g., identifying stated main idea, recalling details, identifying point of view), inferential comprehension (e.g., inferring themes, making predictions), and evaluative comprehension (e.g., analyzing character development, detecting faulty reasoning) for students in grades 4–6.											
C. Provides instruction in comprehension skills that support the transition of students in grades 4–6 from "learning to read" to "reading to learn" (e.g., setting a purpose for reading; applying knowledge of text structures; using text features such as pronunciation guides, introductions, and sidebars) to become self-directed, critical readers.											
D. Uses various instructional strategies to enhance reading comprehension (e.g., linking text content to students' lives and prior knowledge, connecting related ideas across different texts, comparing different versions of the same story, explaining the meaning of common idioms and adages, engaging students in guided and independent reading, guiding students to generate questions and apply knowledge of text topics) for students in grades 4–6.											

Required Course Numbers

Test Content Categories											
E. Knows and teaches strategies that facilitate comprehension of different types of texts (e.g., literary, informational, argumentative) before, during, and after reading (e.g., previewing, making predictions, questioning, self-monitoring, rereading, mapping, using reading journals, discussing texts) for students in grades 4–6.											
F. Knows and teaches strategies that facilitate making connections between and across multiple texts (e.g., summarizing and paraphrasing, locating and distinguishing between facts and opinions, determining whether a text supports or opposes an issue) for students in grades 4–6.											
G. Understands metacognitive skills, including self-evaluation and self-monitoring skills, and teaches students to use those skills to enhance their reading comprehension in grades 4–6.											
H. Knows how to provide students in grades 4–6 with systematic, explicit instruction and reinforcing activities to promote the use of strategies to improve their reading comprehension (e.g., previewing, self-monitoring, visualizing, summarizing).											
I. Selects and uses instructional strategies, materials, and activities to guide students' understanding of their own culture and the cultures of others through reading in grades 4–6.											

Required Course Numbers

Test Content Categories											
J. Understands and teaches the features of various literary genres, including folktales, fables, legends, myths, realistic fiction, historical fiction, tall tales, drama, and poetry, and promotes the development of literary response and analysis skills by providing multiple opportunities for students in grades 4–6 to listen to and respond to literature and to interact with others about literature.											
K. Knows the difference between guided and independent practice in reading and provides students in grades 4–6 with frequent opportunities for both.											
L. Understands how to foster collaboration with families and with other professionals to promote all students' reading comprehension in grades 4–6.											
Competency 005 (Vocabulary Development): <i>The teacher knows the importance of vocabulary development and applies that knowledge to teach reading, listening, speaking, and writing.</i>											
A. Knows how to provide explicit, systematic instruction and reinforcing activities to help students in grades 4–6 increase their vocabulary.											
B. Knows how to use formal and informal methods to effectively teach vocabulary to students in grades 4–6.											
C. Selects and uses a wide range of instructional materials (e.g., literary, informational, argumentative, multimodal, and digital texts), strategies, and opportunities with rich contextual support for vocabulary development for students in grades 4–6.											

Required Course Numbers											
Test Content Categories											
D. Recognizes the importance of selecting, teaching, and modeling a wide range of general and specialized vocabularies for students in grades 4–6.											
E. Understands how to assess and monitor vocabulary knowledge for students in grades 4–6 by providing systematic, age-appropriate instruction and reinforcing activities (e.g., morphemic analysis, etymology, use of graphic organizers, contextual analysis, multiple exposures to a word in various contexts).											
F. Provides multiple opportunities to listen to, read, and respond to various types of literary and informational texts to promote the vocabulary development of students in grades 4–6.											
Competency 006 (Reading, Inquiry, and Research): <i>The teacher understands the importance of inquiry and research skills to students' academic success and provides instruction that promotes students' acquisition and effective use of these skills in the content areas.</i>											
A. Teaches students how to develop open-ended research questions and a plan (e.g., timeline) to locate, retrieve, and record information from a range of primary and secondary sources.											
B. Selects and uses instructional strategies to help students comprehend abstract content and ideas in written materials (e.g., examples, graphic organizers).											

Required Course Numbers

Test Content Categories											
C. Selects and uses instructional strategies to teach students to interpret information presented in various formats (e.g., maps, tables, graphs) and how to locate, retrieve, and record information from technologies, print resources, and experts.											
D. Selects and uses instructional strategies to help students use inquiry and research skills across the curriculum (e.g., brainstorming to generate questions and topics; locating, organizing, evaluating, summarizing, paraphrasing, and communicating information; differentiating between primary and secondary sources; selecting and using relevant, credible sources).											
E. Knows grade-level expectations for inquiry and research skills outlined in the Texas Essential Knowledge and Skills (TEKS) (e.g., in fourth and fifth grades, develop and follow a research plan with adult assistance; in sixth grade, refine the major research question through use of secondary questions).											
F. Provides instruction to develop a topic sentence, summarize findings, and use evidence to support conclusions.											
G. Understands how to foster collaboration with peers, with families, and with other professionals to promote all students' ability to develop effective inquiry and research skills in the content areas.											
Competency 007 (Writing Conventions): <i>The teacher understands the conventions of writing in English and provides instruction that helps students develop proficiency in applying writing conventions.</i>											

Required Course Numbers

Test Content Categories											
A. Understands that many students go through predictable stages in acquiring writing conventions (e.g., physical and cognitive processes involved in word writing, sentence construction, spelling, punctuation, grammatical expression) and that individual students vary in their rates of development of those conventions.											
B. Provides spelling instruction and gives students opportunities to use and develop spelling skills in the context of meaningful written expression (e.g., commonly confused terms, simple and complex contractions).											
C. Selects and uses instructional strategies, materials, and hands-on activities for developing graphomotor skills necessary for writing, according to grade-level expectations in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.											
D. Selects and uses instructional strategies, materials, and activities to help students use English writing conventions (e.g., grammar, capitalization, punctuation) in connected discourse.											
E. Recognizes the similarities and differences between spoken and written English (e.g., syntax, vocabulary choice, audience) and uses instructional strategies to help students apply English writing conventions and enhance their own writing.											
F. Knows writing conventions and appropriate grammar and usage and provides students with direct instruction and structured practice in those areas.											

Required Course Numbers

Test Content Categories											
G. Selects and uses instructional strategies, materials, and activities to teach correct pencil grip.											
Competency 008 (Written Communication): <i>The teacher understands that writing to communicate is a developmental process and provides instruction that promotes students' competence in written communication.</i>											
A. Teaches purposeful, meaningful writing in connection with listening, reading, and speaking.											
B. Knows how to promote students' development of an extensive reading and writing vocabulary by providing students with many opportunities to read and write.											
C. Monitors students' writing development and provides motivational instruction that addresses individual students' needs, strengths, and interests.											
D. Understands differences between first-draft writing and writing for publication and provides instruction in various stages of writing, including prewriting, drafting, revising (including both self-revision and peer revision), and editing.											
E. Understands the benefits of technology for teaching basic writing skills and writing for publication and provides instruction in the use of technology to facilitate written communication.											
F. Understands writing for a variety of audiences, purposes, and settings and provides students with opportunities to write for various audiences, purposes, and settings and in various voices and styles.											

Required Course Numbers

Test Content Categories											
G. Teaches students to use appropriate conventions to support ideas in writing and to use an appropriate form of documentation to acknowledge sources (e.g., quotations, bibliographical information, differentiation between paraphrasing and plagiarism).											
H. Knows grade-level expectations for written communication as described in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.											
I. Understands how to foster collaboration with families and with other professionals to promote students' development of writing skills.											
Competency 009 (Viewing and Representing): <i>The teacher understands skills for interpreting, analyzing, evaluating, and producing visual images and messages in various types of media, including electronic media, and provides students with opportunities to develop skills in this area.</i>											
A. Knows grade-level expectations for viewing and representing visual images and messages as described in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.											
B. Understands and teaches the characteristics and functions of different types of media (e.g., film, print) and knows how different types of media influence and inform.											
C. Teaches students to compare and contrast print, visual, and electronic media, including the level of formality of each (e.g., email, Web-based news article, blogs).											

Required Course Numbers

Test Content Categories											
D. Teaches students to evaluate how visual image makers (e.g., illustrators, documentary filmmakers, political cartoonists, news photographers) represent messages and meanings and provides students with opportunities to interpret and evaluate visual images in various media.											
E. Knows how to teach students to analyze visual image makers' choices (e.g., style, elements, media) and evaluate how those choices help represent or extend meaning.											
F. Provides students with opportunities to interpret events and ideas based on information from maps, charts, graphics, video segments, and technology presentations and to use media to compare ideas and points of view.											
G. Knows steps and procedures for teaching students to produce visual images and messages with various meanings to communicate with others.											
H. Teaches students how to select, organize, and produce visuals to complement and extend meanings.											
I. Provides students with opportunities to use technology for producing various types of communications (e.g., class newspapers, multimedia reports, video reports) and helps students analyze how language, medium, and presentation contribute to the message.											
J. Understands how to foster collaboration with families and with other professionals to promote students' development of media literacy.											

Required Course Numbers											
Test Content Categories											
Competency 010 (Assessment of Developing Literacy): <i>The teacher understands the basic principles of literacy assessment and uses a variety of assessments to guide literacy instruction.</i>											
A. Knows how to select and administer formative and summative assessments to students in grades 4–6 and use results to measure literacy skills (e.g., word analysis and word identification skills, fluency, comprehension, writing conventions, written communications, visual images, inquiry skills) and address individual students' needs identified in informal and formal assessments.											
B. Knows the characteristics of informal and formal reading comprehension assessments (e.g., criterion-referenced state tests, curriculum-based reading assessments, informal reading inventories, norm-referenced tests).											
C. Analyzes students' reading and writing performance and uses the information as a basis for instruction in grades 4–6.											
D. Knows the state content and performance standards for reading, writing, listening, and speaking that constitute the Texas Essential Knowledge and Skills (TEKS) and recognizes when a student needs additional help or intervention to bring the student's performance up to grade level for students in grades 4–6.											

Required Course Numbers

Test Content Categories											
E. Knows how to determine students' independent, instructional, and frustration reading levels and uses the information to select appropriate materials for individual students and to guide students' selection of independent reading materials in grades 4–6.											
F. Uses ongoing assessments to determine when a student may be in need of classroom intervention or specialized reading instruction and to develop appropriate instructional plans for students in grades 4–6.											
G. Understands the use of writing in assessment of students and provides opportunities for students to self-assess and peer-assess writing (e.g., for clarity, interest to audience, comprehensiveness) and their ongoing literacy development.											
H. Knows how to select, administer, and use results from informal and formal assessments of literacy skills for students in grades 4–6.											
I. Analyzes students' errors in reading and responds to individual students' needs by providing focused instruction to promote literacy skills.											
J. Knows informal and formal procedures for assessing students' use of writing conventions and uses multiple, ongoing assessments to monitor and evaluate students' development in that area.											
K. Uses ongoing assessments of writing conventions to determine when students need additional help or intervention to bring students' performance to grade level based on state content and performance standards for writing in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.											

Required Course Numbers

Test Content Categories											
L. Analyzes students' errors in applying writing conventions and uses the results of the analysis as a basis for future instruction for students in grades 4–6.											
M. Selects and uses a variety of formal and informal procedures for monitoring students' reading comprehension and adjusts instruction to meet the needs of individual students, including English learners, for students in grades 4–6.											
N. Understands how to foster collaboration with families and how to communicate information about students' progress and ongoing literacy development to parents/caregivers and to other professionals through a variety of means, including the use of examples of students' work, for students in grades 4–6.											
Subject II – Mathematics (902)											
Competency 001 (Mathematics Instruction): <i>The teacher understands how students learn mathematical skills and uses that knowledge to plan, organize and implement instruction and assess learning.</i>											
A. Plan appropriate instructional activities for all students by applying research-based theories and principles of learning mathematics.											
B. Employ instructional strategies that build on the linguistic, cultural and socioeconomic diversity of students and that relate to students' lives and communities.											

Required Course Numbers

Test Content Categories											
C. Plan and provide developmentally appropriate instruction that establishes transitions between concrete, symbolic and abstract representations of mathematical knowledge and that builds on students' strengths and addresses their needs.											
D. Understand how manipulatives and technological tools can be used appropriately to assist students in developing, comprehending and applying mathematical concepts.											
E. Create a learning environment that motivates all students and actively engages them in the learning process by using a variety of interesting, challenging and worthwhile mathematical tasks in individual, small-group and large-group settings.											
F. Use a variety of tools (e.g., counters, standard and nonstandard units of measure, rulers, protractors, scales, stopwatches, measuring containers, money, calculators, software) to strengthen students' mathematical understanding.											
G. Implement a variety of instructional methods and tasks that promote students' ability to do the mathematics described in the Texas Essential Knowledge and Skills (TEKS).											
H. Develop clear learning goals to plan, deliver, assess and reevaluate instruction based on the mathematics in the Texas Essential Knowledge and Skills (TEKS).											
I. Help students make connections between mathematics and the real world, as well as between mathematics and other disciplines such as art, music, science, social science and business.											

Required Course Numbers

Test Content Categories											
J. Use a variety of questioning strategies to encourage mathematical discourse and to help students analyze and evaluate their mathematical thinking.											
K. Use a variety of formal and informal assessments and scoring procedures to evaluate mathematical understanding, common misconceptions and error patterns.											
L. Understand the relationship between assessment and instruction and know how to evaluate assessment results to design, monitor and modify instruction to improve mathematical learning for all students, including English-language learners.											
M. Understand the purpose, characteristics and uses of various assessments in mathematics, including formative and summative assessments.											
N. Understand how mathematics is used in a variety of careers and professions and plan instruction that demonstrates how mathematics is used in the workplace.											
Competency 002 (Number Concepts and Operations): <i>The teacher understands concepts related to numbers, operations and algorithms and the properties of numbers.</i>											
A. Analyze, create, describe, compare and model relationships between number properties, operations and algorithms for the four basic operations involving integers, rational numbers and real numbers, including real-world situations.											

Required Course Numbers											
Test Content Categories											
B. Demonstrate an understanding of equivalency among different representations of rational numbers and between mathematical expressions.											
C. Select appropriate representations of real numbers (e.g., fractions, decimals, percents) for particular situations.											
D. Demonstrate an understanding of ideas from number theory (e.g., prime factorization, greatest common divisor, divisibility rules) as they apply to whole numbers, integers and rational numbers, and use those ideas in problem situations.											
E. Understand the relative magnitude of whole numbers, integers, rational numbers and real numbers including the use of comparative language and sets of objects.											
F. Identify and demonstrate an understanding of and uses of a variety of models and objects for representing numbers (e.g., fraction strips, diagrams, patterns, shaded regions, number lines).											
G. Use a variety of concrete and visual representations to demonstrate the connections between operations and algorithms.											
H. Identify, demonstrate and apply knowledge of counting techniques, including combinations, to quantify situations and solve math problems (e.g., to include forward, backward and skip counting, with or without models).											

Required Course Numbers											
Test Content Categories											
I. Identify, represent and apply knowledge of place value (e.g., to compose and decompose numbers), rounding and other number properties to perform mental mathematics and computational estimation with automaticity.											
J. Demonstrate a thorough understanding of fractions, including the use of various representations to teach fractions and operations involving fractions.											
K. Use a variety of strategies to generate and solve problems that involve one or more steps, with fluency.											
Competency 003 (Patterns and Algebra): <i>The teacher understands concepts related to patterns, relations, functions and algebraic reasoning.</i>											
A. Illustrate relations and functions using concrete models, tables, graphs and symbolic and verbal representations, including real-world applications.											
B. Demonstrate an understanding of the concept of linear function using concrete models, tables, graphs and symbolic and verbal representations.											
C. Understand how to use algebraic concepts and reasoning to investigate patterns, make generalizations, formulate mathematical models, make predictions and validate results.											
D. Formulate implicit and explicit rules to describe and construct sequences verbally, numerically, graphically and symbolically.											

Required Course Numbers											
Test Content Categories											
E. Know how to identify, extend, and create patterns using concrete models, figures, numbers and algebraic expressions.											
F. Use properties, graphs, linear and nonlinear functions and applications of relations and functions to analyze, model and solve problems in mathematical and real-world situations.											
G. Translate problem-solving situations into expressions and equations involving variables and unknowns.											
H. Model and solve problems, including those involving proportional reasoning, using concrete, numeric, tabular, graphic and algebraic methods (e.g., using ratios and percents with fractions and decimals).											
I. Determine the linear function that best models a set of data.											
J. Understand and describe the concept of and relationships among variables, expressions, equations, inequalities and systems in order to analyze, model and solve problems.											
K. Apply algebraic methods to demonstrate an understanding of whole numbers using any of the four basic operations.											
Competency 004 (Geometry and Measurement): <i>The teacher understands concepts and principles of geometry and measurement.</i>											
A. Apply knowledge of spatial concepts such as direction, shape and structure.											
B. Identify, use, understand and model the development of formulas to find lengths, perimeters, areas and volumes of geometric figures.											

Required Course Numbers											
Test Content Categories											
C. Use the properties of congruent triangles to explore geometric relationships.											
D. Identify, use and understand concepts and properties of points, lines, planes, angles, lengths and distances.											
E. Analyze and apply the properties of parallel and perpendicular lines.											
F. Use a variety of representations (e.g., numeric, verbal, graphic, symbolic) to analyze and solve problems involving angles and two- and three-dimensional figures such as circles, triangles, polygons, cylinders, prisms and spheres.											
G. Use symmetry to describe tessellations and shows how they can be used to illustrate geometric concepts, properties and relationships.											
H. Understand measurement concepts and principles, including methods of approximation and estimation, and the effects of error on measurement.											
I. Explain, illustrate, select and use appropriate units of measurement to quantify and compare time, temperature, money, mass, weight, area, capacity, volume, percent, speed and degrees of an angle.											
J. Use translations, rotations and reflections to illustrate similarities, congruencies and symmetries of figures.											
K. Develop, justify and use conversions within and between measurement systems.											

Required Course Numbers											
Test Content Categories											
L. Understand logical reasoning, justification and proof in relation to the axiomatic structure of geometry and use reasoning to develop, generalize, justify and prove geometric relationships.											
M. Understand attributes of various polygons, including names and how sides and angles of the polygon affect its attributes.											
N. Partition or decompose polygons to express areas as fractions of a whole or to find areas of nonstandard polygons.											
O. Demonstrate the value and relationships of United States coins and bills and use appropriate symbols to name the value of a collection.											
P. Identify, use and understand the concepts and properties of geometric figures and their relationships.											
Q. Describe the key attributes of the coordinate plane and model the process of graphing ordered pairs.											
Competency 005 (Probability and Statistics): <i>The teacher understands concepts related to probability and statistics and their applications.</i>											
A. Investigate and answer questions by collecting, organizing and displaying data in a variety of formats as described in the Texas Essential Knowledge and Skills (TEKS) and draws conclusions from any data graph.											
B. Demonstrate an understanding of measures of central tendency (e.g., mean, median, mode) and range and use those measures to describe a set of data.											

Required Course Numbers											
Test Content Categories											
C. Explore concepts of probability through data collection, experiments and simulations.											
D. Use the concepts and principles of probability to describe the outcome of simple and compound events.											
E. Determine probabilities by constructing sample spaces to model situations.											
F. Apply deep knowledge of the use of probability, in different scenarios, to make observations, draw conclusions and create relationships.											
G. Solve a variety of probability problems using combinations and geometric probability (e.g., probability as the ratio of two areas).											
H. Support arguments, make predictions and draw conclusions using summary statistics and graphs to analyze and interpret one-variable data.											
I. Apply knowledge of designing, conducting, analyzing and interpreting statistical experiments to investigate real-world problems.											
J. Generate, simulate and use probability models to represent situations.											
K. Use the graph of the normal distribution as a basis for making inferences about a population.											
Competency 006 (Mathematical Processes): <i>The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems and make mathematical connections within and outside of mathematics.</i>											

Required Course Numbers

Test Content Categories											
A. Understand the role of logical reasoning in mathematics and use formal and informal reasoning to explore, investigate and justify mathematical ideas.											
B. Apply correct mathematical reasoning to derive valid conclusions from a set of premises.											
C. Apply principles of inductive reasoning to make conjectures and use deductive methods to evaluate the validity of conjectures.											
D. Evaluate the reasonableness of a solution to a given problem.											
E. Understand connections among concepts, procedures and equivalent representations in areas of mathematics (e.g., algebra, geometry).											
F. Recognize that a mathematical problem can be solved in a variety of ways and select an appropriate strategy for a given problem.											
G. Express mathematical statements using developmentally appropriate language, standard English, mathematical language and symbolic mathematics.											
H. Communicate mathematical ideas using a variety of representations (e.g., numeric, verbal, graphic, pictorial, symbolic, concrete).											
I. Demonstrate an understanding of the use of visual media such as graphs, tables, diagrams and animations to communicate mathematical information.											

Required Course Numbers											
Test Content Categories											
J. Demonstrate an understanding of estimation, including the use of compatible numbers, and evaluate its appropriate uses.											
K. Know how to use mathematical manipulatives and a wide range of appropriate technological tools to develop and explore mathematical concepts and ideas.											
L. Demonstrate knowledge of the history and evolution of mathematical concepts, procedures and ideas.											
M. Recognize the contributions that different cultures have made to the field of mathematics and the impact of mathematics on society and cultures.											
N. Apply mathematics to model and solve problems to manage financial resources effectively for lifetime financial security, as it relates to teaching students (e.g., distinguishes between fixed and variable expenses, calculates profit in a given situation, develops a system for keeping and using financial records, describes actions that might be taken to develop and balance a budget when expenses exceed income).											
Subject III – Social Studies (903)											
Competency 001 (Social Science Instruction): <i>The teacher understands and applies social science knowledge and skills to plan, organize and implement instruction and assess learning.</i>											
A. Understand the social studies content and performance standards that constitute the Texas Essential Knowledge and Skills (TEKS).											

Required Course Numbers

Test Content Categories											
B. Understand the vertical alignment of the social sciences in the Texas Essential Knowledge and Skills (TEKS) from grade level to grade level, including prerequisite knowledge and skills.											
C. Understand and use social studies terminology correctly.											
D. Understand the implications of stages of student growth and development for designing and implementing effective learning experiences in the social sciences (e.g., knowledge of and respect for self, family and communities; sharing; following routines; working cooperatively in groups).											
E. Select and apply effective, developmentally appropriate instructional practices, activities, technologies and materials to promote students' knowledge and skills in the social sciences.											
F. Select and apply current technology as a tool for teaching and communicating social studies concepts.											
G. Select and uses effective instructional strategies, activities, technologies and materials to promote students' knowledge and skills in the social sciences.											
H. Understand how to promote students' use of social science skills, vocabulary and research tools, including currently available technological tools.											
I. Apply instruction that relates skills, concepts and ideas across different social science disciplines.											

Required Course Numbers

Test Content Categories											
J. Provide and facilitate instruction that helps students make connections between knowledge and methods in the social sciences and in other content areas.											
K. Use a variety of formal and informal assessments and knowledge of the Texas Essential Knowledge and Skills (TEKS) to determine students' progress and needs and to help plan instruction that addresses the strengths, needs and interests of all students, including English-language learners and students with special needs.											
L. Understand and relate practical applications of social science issues and trends.											
M. Create maps and other graphics to represent geographic, political, historical, economic and cultural features, distributions and relationships.											
N. Communicate the value of social studies education to students, parents/caregivers, colleagues and the community.											
Competency 002 (History): <i>The teacher understands and applies knowledge of significant historical events and developments, multiple historical interpretations and ideas and relationships between the past, the present and the future as defined by the Texas Essential Knowledge and Skills (TEKS).</i>											
A. Demonstrate an understanding of historical points of reference in the history of Texas, the United States and the world (e.g., the Texas Revolution, the Republic of Texas and the annexation of Texas by the United States).											

Required Course Numbers

Test Content Categories											
B. Analyze how individuals, events and issues shaped the history of Texas, the United States and the world.											
C. Demonstrate an understanding of similarities and differences among Native American groups in Texas, the United States and the Western Hemisphere before European colonization.											
D. Demonstrate an understanding of the causes and effects of European exploration and colonization of Texas, the United States and the Western Hemisphere.											
E. Analyze the influence of various factors (e.g., geographic contexts, processes of spatial exchange, science, technology) on the development of societies.											
F. Understand common characteristics of communities past and present, including reasons people have formed communities (e.g., need for security, religious freedom, law and material well-being), ways in which different communities meet their needs (e.g., government, education, communication, transportation, recreation) and how historical figures, patriots and good citizens helped shape communities, states and nations.											
G. Demonstrate an understanding of basic concepts of culture and the processes of cultural adaptation, diffusion and exchange.											
H. Apply knowledge and analyze the effects of scientific, mathematical and technological innovations on political, economic, social and environmental developments as they relate to daily life in Texas, the United States and the world.											

Required Course Numbers

Test Content Categories											
I. Demonstrate an understanding of historical information and ideas in relation to other disciplines.											
J. Demonstrate an understanding of how to formulate historical research questions and use appropriate procedures to reach supportable judgments and conclusions in the social sciences.											
K. Demonstrate an understanding of historical research and know how historians locate, gather, organize, analyze and report information by using standard research methodologies.											
L. Know the characteristics and uses of primary and secondary sources for historical research (e.g., databases, maps, photographs, media services, the Internet, biographies, interviews, questionnaires, artifacts); analyze historical information from primary and secondary sources; understand and evaluate information in relation to bias, propaganda, point of view and frame of reference.											
M. Apply and evaluate the use of problem-solving processes, gathering of information, listing and considering options, considering advantages and disadvantages, choosing and implementing solutions and assessing the effectiveness of solutions.											
N. Apply and evaluate the use of decision-making processes to identify situations that require decisions: by gathering information, identifying options, predicting consequences and taking action to implement the decisions.											

Required Course Numbers

Test Content Categories											
O. Communicate and interpret historical information in written, oral and visual forms and translate information from one medium to another (e.g., written to visual, statistical to written or visual).											
P. Analyze historical information by categorizing, comparing and contrasting, making generalizations and predictions and drawing inferences and conclusions (e.g., regarding population statistics, patterns of migration, voting trends and patterns).											
Q. Apply knowledge of the concept of chronology and its use in understanding history and historical events.											
R. Apply different methods of interpreting the past to understand, evaluate and support multiple points of view, frames of reference and the historical context of events and issues.											
S. Demonstrate an understanding of the foundations of representative government in the United States, significant individuals, events and issues of the Revolutionary era and challenges confronting the United States government in the early years of the Republic.											
T. Demonstrate an understanding of westward expansion and analyze its effects on the political, economic and social development of the United States and Texas, including its effects on American Indian life.											
U. Analyze ways that political, economic and social factors led to the growth of sectionalism and the Civil War.											

Required Course Numbers

Test Content Categories											
V. Understand individuals, issues and events involved in the Civil War and analyze the effects of Reconstruction on the political, economic and social life of the United States and Texas.											
W. Demonstrate an understanding of major United States and Texas reform movements of the nineteenth and twentieth centuries (e.g., abolitionism, women’s suffrage, civil rights, temperance).											
X. Demonstrate knowledge of boom and bust cycles of leading Texas industries (e.g., railroads, the cattle industry, oil and gas production, cotton, real estate, banking, computer technology).											
Y. Demonstrate an understanding of important individuals, issues and events of the twentieth and twenty-first centuries in Texas, the United States and the world (e.g., urbanization, Great Depression, the Dust Bowl, the Second World War, growth of the oil and gas industry).											
Z. Analyze ways that particular contemporary societies reflect historical events (e.g., invasion, conquests, colonization, immigration).											
Competency 003 (Geography and Culture): <i>The teacher understands and applies knowledge of geographic relationships involving people, places and environments in Texas, the United States and the world; the teacher also understands and applies knowledge of cultural development, adaptation, diversity and interactions among science, technology and society as defined by the Texas Essential Knowledge and Skills (TEKS).</i>											

Required Course Numbers

Test Content Categories											
A. Analyze and apply knowledge of key concepts in geography (e.g., location, distance, region, grid systems) and know the locations and the human and physical characteristics (e.g., culture, diversity) of places and regions in Texas, the United States and the world.											
B. Analyze ways that location (absolute and relative) affects people, places and environments (e.g., the location of renewable and nonrenewable natural resources such as fresh water, fossil fuels, fertile soils and timber).											
C. Analyze how geographic factors have influenced the settlement patterns, economic development, political relationships and historical and contemporary societies, including those of Texas, the United States and the world.											
D. Demonstrate an understanding of physical processes (e.g., erosion, deposition, weathering; plate tectonics; sediment transfer; flows and exchanges of energy and matter in the atmosphere that produce weather and climate; weather patterns) and their effects on environmental patterns.											
E. Analyze how humans adapt to, use and modify the physical environment and how the physical characteristics of places and human modifications to the environment affect human activities and settlement patterns.											
F. Demonstrate an understanding of the physical environmental characteristics of Texas, the United States and the world, past and present, and analyze how humans have adapted to and modified the environment.											

Required Course Numbers

Test Content Categories											
G. Examine how developments in science and technology affect the physical environment; the growth of economies and societies; and definitions of, access to and the use of physical and human resources.											
H. Create and interpret maps of places and regions that contain map elements, draw sketch maps that illustrate various places and regions, and use the compass rose, grid system and symbols to locate places on maps and globes.											
I. Demonstrate an understanding of basic concepts of culture; processes of cultural adaptation, diffusion and exchange; and positive and negative qualities of a multicultural society.											
J. Demonstrate an understanding of the contributions made by people of various racial, ethnic and religious groups.											
K. Analyze the effects of race, gender, socioeconomic class, status and stratification on ways of life in Texas, the United States and the world.											
L. Identify, explain and compare various ethnic and/or cultural customs, celebrations and traditions.											
M. Demonstrate an understanding of relationships among cultures of people from various groups, including racial, ethnic and religious groups, in the United States and throughout the world (e.g., conflict and cooperation among cultures; factors that influence cultural change, such as improved communication, transportation and economic development).											

Required Course Numbers

Test Content Categories											
N. Compare and analyze similarities and differences in the ways various peoples at different times in history have lived and have met basic human needs, including the various roles of men, women, children and families in past and present cultures.											
O. Compare similarities and differences among Native American groups in Texas, the United States and the Western Hemisphere before European colonization.											
P. Apply knowledge of the role of families in meeting basic human needs and how families and cultures develop and use customs, traditions and beliefs to define themselves.											
Q. Understand and apply the concept of diversity within unity.											
R. Relate geographic and cultural information and ideas to information and ideas in other social sciences and other disciplines.											
S. Formulate geographic and cultural research questions and use appropriate procedures to reach supportable judgments and conclusions.											
T. Demonstrate an understanding of research related to geography and culture and know how social scientists in those fields locate, gather, organize, analyze and report information using standard research methodologies.											

Required Course Numbers

Test Content Categories											
<p>U. Demonstrate an understanding of the characteristics and uses of various primary and secondary sources (e.g., databases, maps, photographs, media services, the Internet, biographies, interviews, questionnaires, artifacts); utilize information from a variety of sources to acquire social science information; answer social science questions; and evaluate information in relation to bias, propaganda, point of view and frame of reference.</p>											
<p>V. Apply evaluative, problem-solving and decision-making skills to geographic and cultural information, ideas and issues by identifying problems, gathering information, listing and considering options, considering advantages and disadvantages, choosing and implementing solutions, and assessing the solutions' effectiveness.</p>											
<p>W. Communicate and interpret geographic and cultural information in written, oral and visual form (e.g., maps and other graphics) and translate the information from one medium to another (e.g., written to visual, statistical to written or visual).</p>											
<p>X. Analyze geographic and cultural data using geographical tools and basic mathematical and statistical concepts and analytic methods.</p>											
<p>Y. Understand and analyze the characteristics, distribution and migration of populations and the interactions between people and the physical environment, including the effects of those interactions on the development of Texas, the United States and the world.</p>											

Required Course Numbers

Test Content Categories											
Z. Demonstrate knowledge of the institutions that exist in all societies and how the characteristics of those institutions may vary among societies.											
AA. Demonstrate an understanding of how people use oral tradition, stories, real and mythical heroes, music, paintings and sculpture to represent culture in communities in Texas, the United States and the world (e.g., importance of individual writers and artists to the cultural heritage of communities; significant examples of art, music and literature from various periods).											
BB. Understand the relationship between the arts and the times and societies in which they are produced, including how past and contemporary issues influence creative expressions, and identify examples of art, music and literature that have transcended the boundaries of societies and convey universal themes such as religion, justice and the passage of time.											
CC. Analyze relationships among religion, philosophy and culture and their effect on ways of life in Texas, the United States and the world.											
DD. Understand and analyze how changes in science and technology relate to political, economic, social and cultural issues and events.											
Competency 004 (Economics): <i>The teacher understands and applies knowledge of economic systems and how people organize economic systems to produce, distribute and consume goods and services.</i>											

Required Course Numbers

Test Content Categories											
A. Compare and contrast similarities and differences in how various peoples at different times in history have lived and met basic human needs, including the various roles of men, women, children and families in past and present cultures.											
B. Understand and apply knowledge of basic economic concepts (e.g., economic system, goods and services, free enterprise, interdependence, needs and wants, scarcity, roles of producers and consumers, factors of production, specialization and trade, entrepreneurship); know that basic human needs are met in many ways; and understand the value and importance of work and of spending, saving and budgeting money.											
C. Demonstrate knowledge of the ways people organize economic systems and of the similarities and differences among various economic systems around the world.											
D. Understand and apply the knowledge of the characteristics, benefits and development of the free-enterprise system in Texas and the United States and how businesses operate in the United States free-enterprise system (e.g., importance of morality and ethics in maintaining a functional free-enterprise system and the impact of past and present entrepreneurs).											
E. Apply knowledge of the effects of supply and demand on consumers and producers in a free-enterprise system.											

Required Course Numbers											
Test Content Categories											
F. Demonstrate knowledge of patterns of work and economic activities in Texas and the United States, past and present, including the roles of consumers and producers, and the impact of geographic factors, immigration, migration, limited resources, mass production, specialization and division of labor, and American ideas about progress and equal opportunity.											
G. Demonstrate knowledge of categories of economic activities, economic indicators and how a society's economic level is measured.											
H. Understand the effects of government regulation and taxation on consumers, economic development and business planning.											
I. Demonstrate an understanding of major events, trends and issues in economic history (e.g., factors leading societies to change from rural to urban or agrarian to industrial, economic reasons for exploration and colonization, economic forces leading to the Industrial Revolution, processes of economic development in different areas of the world, factors leading to the emergence of different patterns of economic activity in the various regions of the United States).											
J. Analyze the interdependence of the Texas economy with those of the United States and the world.											
Competency 005 (Government and Citizenship): <i>The teacher understands and applies knowledge of concepts of government, democracy and citizenship, including ways that individuals and groups achieve their goals through political systems.</i>											

Required Course Numbers

Test Content Categories											
A. Demonstrate knowledge of historical origins of democratic forms of government, such as ancient Greece.											
B. Understand and apply the purpose of rules and laws; the relationship between rules, rights and responsibilities; the fundamental rights of American citizens guaranteed in the Bill of Rights and other amendments to the United States Constitution; and the individual's role in making and enforcing rules and ensuring the welfare of society.											
C. Understand the basic structure and functions of the United States government, the Texas government and local governments (including the roles of public officials); the relationships among national, state and local governments; and how local, state and national government services are financed.											
D. Demonstrate knowledge of key principles and ideas contained in major political documents of Texas and the United States (e.g., the Declaration of Independence, United States Constitution, Texas Constitution) and of relationships among political documents.											
E. Demonstrate an understanding of how people organized governments in colonial America and during the early development of Texas.											
F. Understand the political processes in the United States and Texas and how the United States political system works.											

Required Course Numbers

Test Content Categories											
G. Demonstrate knowledge of types of government (e.g., democratic, totalitarian, monarchical) and their respective levels of effectiveness in meeting citizens' needs (e.g., reasons for limiting the power of government, record of human rights abuses by limited and unlimited governments).											
H. Understand the formal and informal processes of changing the United States and Texas Constitutions and the impact of changes on society.											
I. Understand and promote students' understanding of the impact of landmark Supreme Court cases.											
J. Understand the components of the democratic process (e.g., voluntary individual participation, effective leadership, expression of different points of view, the selection of public officials) and their significance in a democratic society.											
K. Understand the importance of effective leadership in a constitutional republic and identify past and present leaders in state, local and national governments and their leadership qualities and contributions.											
L. Demonstrate knowledge of important customs, symbols, landmarks and celebrations that represent American and Texan beliefs and principles and contribute to national unity.											
M. Analyze the relationships between individual rights, responsibilities and freedoms in democratic societies.											

Required Course Numbers											
Test Content Categories											
N. Apply knowledge of the rights and responsibilities of citizens and nonprofit and civic groups in Texas and the United States, past and present, and understand characteristics of good citizenship (e.g., community service) as exemplified by historical and contemporary figures.											
O. Understand how the nature, rights and responsibilities of citizenship vary among societies.											
Subject IV – Science (904)											
Competency 001 (Lab Processes, Equipment and Safety): <i>The teacher understands how to manage learning activities, tools, materials, equipment and technologies to ensure the safety of all students.</i>											
A. Understand safety regulations and guidelines for science facilities and science instruction.											
B. Know procedures for and sources of information regarding the appropriate handling, use, disposal, care and maintenance of chemicals, materials, specimens and equipment.											
C. Know procedures for the safe handling and ethical care and treatment of organisms and specimens.											
D. Select and safely use appropriate tools, technologies, materials and equipment needed for instructional activities.											
E. Understand concepts of precision, accuracy and error with regard to reading and recording numerical data from a scientific instrument.											

Required Course Numbers

Test Content Categories											
F. Understand how to gather, organize, display and communicate data in a variety of ways (e.g., charts, tables, graphs, diagrams, written reports, oral presentations).											
G. Understand the international system of measurement (i.e., metric system) and perform unit conversions within measurement systems, including the use of nonstandard units.											
Competency 002 (History and Nature of Science): <i>The teacher understands the history and nature of science, the process and role of scientific inquiry and the role of inquiry in science instruction.</i>											
A. Understand, plan, design and implement instruction that provides opportunities for all students to engage in nonexperimental- and experimental-inquiry investigations.											
B. Focus inquiry-based instruction on questions and issues relevant to students and use strategies to assist students with generating, refining and focusing scientific questions and hypotheses.											
C. Understand and instruct students in the safe and proper use of a variety of grade-appropriate tools, equipment, resources, technology and techniques to access, gather, store, retrieve, organize and analyze data.											
D. Know how to guide students in making systematic observations and measurements and posing questions to guide investigations.											
E. Know how to promote the use of critical-thinking skills, logical reasoning and scientific problem solving to reach conclusions based on evidence.											

Required Course Numbers											
Test Content Categories											
F. Know how to teach students to develop, analyze and evaluate different explanations for a given scientific result, including that repeated investigations may increase reliability.											
G. Know how to teach students to demonstrate an understanding of potential sources of error in inquiry-based investigation.											
H. Know how to teach students to demonstrate an understanding of how to communicate and defend the results of an inquiry-based investigation.											
I. Understand principles of scientific ethics.											
J. Understand the roles that logical reasoning, verifiable evidence, prediction and peer review play in the process of generating and evaluating scientific knowledge.											
K. Understand the historical development of science (e.g., cell theory, plate tectonics, laws of motion, universal gravity) and technology and the contributions that diverse cultures and individuals of both genders have made to scientific and technological knowledge.											
Competency 003 (Impact of Science): <i>The teacher understands how science impacts the daily lives of students and interacts with and influences personal and societal decisions.</i>											
A. Understand that decisions about the use of science are based on factors such as ethical standards, economics and personal and societal needs.											

Required Course Numbers											
Test Content Categories											
B. Apply scientific principles to analyze the advantages of, disadvantages of or alternatives to a given decision or course of action.											
C. Apply scientific principles and processes to analyze factors that influence personal choices concerning fitness and health, including physiological and psychological effects and risks associated with the use of substances and substance abuse.											
D. Understand concepts, characteristics and issues related to changes in populations and human population growth.											
E. Identify and understand the types and uses of natural resources and the effects of human consumption on the renewal and depletion of resources.											
F. Understand the role science and scientists can play in helping resolve personal, societal and global challenges.											
Competency 004 (Concepts and Processes): <i>The teacher knows and understands the unifying concepts and processes that are common to all sciences.</i>											
A. Understand how a unifying, explanatory framework across the science disciplines is provided by the concepts and processes of systems, order and organization; evidence, models and explanation; change, constancy and measurements; and form and function.											
B. Demonstrate an understanding of how patterns in observations and data can be used to make explanations and predictions.											

Required Course Numbers											
Test Content Categories											
C. Analyze interactions and interrelationships between systems and subsystems.											
D. Apply unifying concepts to explore similarities in a variety of natural phenomena.											
E. Understand how properties and patterns of systems can be described in terms of space, time, energy and matter.											
F. Understand how change and constancy occur in systems.											
G. Understand the complementary nature of form and function in a given system.											
H. Understand how models are used to represent the natural world and how to evaluate the strengths and limitations of a variety of scientific models (e.g., physical, conceptual, mathematical).											
Competency 005 (Students as Learners and Science Instruction): <i>The teacher has theoretical and practical knowledge about teaching science and about how students learn science.</i>											
A. Understand how developmental characteristics, prior knowledge and experience and students' attitudes influence science learning.											
B. Select and adapt science curricula, content, instructional materials, collaborations, vocabulary and activities to meet the levels of interest, knowledge and understanding as well as the abilities, experiences and needs of all students, including English-language learners.											

Required Course Numbers

Test Content Categories											
C. Understand how to use situations from students' daily lives to develop instructional materials that investigate how science can be used to make informed decisions.											
D. Understand common misconceptions in science and have effective ways to address those misconceptions.											
E. Understand developmentally appropriate design and implementation of hands-on learning experiences in science and select effective, appropriate instructional practices, activities, technologies and materials to promote students' scientific knowledge, skills and inquiry processes.											
F. Understand questioning strategies designed to elicit higher-level thinking and how to use them to move students from concrete to more abstract understanding.											
G. Understand the importance of planning activities that are inclusive and that accommodate the needs of all students.											
H. Understand how to sequence learning activities in a way that enables students to build on their prior knowledge and that challenges them to expand their understanding of science.											
Competency 006 (Science Assessment): <i>The teacher knows the varied and appropriate assessments and assessment practices for monitoring science learning in laboratory, field and classroom settings.</i>											

Required Course Numbers

Test Content Categories											
A. Understand the relationships between a science curriculum, assessment and instruction and base instruction on information gathered through assessment of students' strengths and needs.											
B. Understand the importance of monitoring and assessing students' understanding of science concepts and skills on an ongoing basis, including how to use formal and informal assessments of student performance and how to use products (e.g., projects, lab journals, rubrics, portfolios, student profiles, checklists) to evaluate students' understanding of and participation in the inquiry process.											
C. Select — or design — and administer a variety of appropriate assessments (e.g., performance assessment, self-assessment, formal/informal assessment, formative/summative assessment) to monitor students' understanding and progress and to plan for instruction.											
D. Understand the importance of communicating evaluation criteria and assessment results to students.											
Competency 007 (Forces and Motion): <i>The teacher understands forces and motion and their relationships.</i>											
A. Demonstrate an understanding of the properties of universal forces (e.g., gravitational, electrical, magnetic).											
B. Understand how to measure, graph and describe changes in motion by using concepts of position, direction of motion and speed.											

Required Course Numbers											
Test Content Categories											
C. Analyze the ways unbalanced forces acting on an object cause changes in the position or motion of the object.											
D. Analyze the relationship between force and motion in a variety of situations (e.g., simple machines, geologic processes).											
Competency 008 (Physical and Chemical Properties): <i>The teacher understands the physical and chemical properties of and changes in matter.</i>											
A. Describe and measure the physical and chemical properties of substances (e.g., size, shape, temperature, magnetism, hardness, mass, conduction, density).											
B. Describe the physical properties of solids, liquids and gases.											
C. Distinguish between physical and chemical changes in matter.											
D. Apply knowledge of physical and chemical properties (including atomic structure) of and changes in matter to processes and situations that occur in life and in earth and space science.											
E. Distinguish between elements, compounds, mixtures and solutions and describe their properties.											
F. Describe and explain the occurrence and importance of a variety of chemical reactions that occur in daily life (e.g., rusting, burning of fossil fuels, photo-synthesis, cell respiration, chemical batteries, digestion of food).											
Competency 009 (Energy and Interactions): <i>The teacher understands energy and interactions between matter and energy.</i>											

Required Course Numbers											
Test Content Categories											
A. Understand conservation of energy and energy transformations and analyze how energy is transformed from one form to another (e.g., potential, kinetic, mechanical, sound, heat, light, chemical, electrical) in a variety of everyday situations and how increasing or decreasing amounts affect objects.											
B. Understand the basic concepts of heat energy and related processes (e.g., melting, evaporation, boiling, condensation, conduction, convection, and radiation).											
C. Understand the principles of electricity and magnetism and their applications (e.g., electric circuits, electromagnetic fields, motors, audio speakers, lightning).											
D. Apply knowledge of properties of light (e.g., reflection, refraction) to describe the functioning of optical systems and phenomena (e.g., camera, microscope, rainbow, eye).											
E. Demonstrate an understanding of the properties, production, and transmission of sound.											
Competency 010 (Energy Transformations and Conservation): <i>The teacher understands energy transformations and the conservation of matter and energy.</i>											
A. Describe sources of electrical energy and processes of energy transformation for human uses (e.g., fossil fuels, solar panels, hydroelectric plants).											

Required Course Numbers											
Test Content Categories											
B. Apply knowledge of transfer of energy in a variety of situations (e.g., the production of heat, light, sound and magnetic effects by electrical energy; the process of photosynthesis; weather processes; food webs; food and energy pyramids).											
C. Understand applications of energy transformations and the conservation of matter and energy in life and in earth and space science.											
Competency 011 (Structure and Function of Living Things): <i>The teacher understands the structure and function of living things.</i>											
A. Understand that living systems have different structures that perform different functions.											
B. Understand and describe stages in the life cycles of common plants and animals (including animals that experience complete and incomplete metamorphosis).											
C. Understand that organisms have basic needs.											
D. Analyze how structure complements function in cells, tissues, organs, organ systems and organisms.											
E. Identify human body systems and describe their functions.											
F. Understand the relationship between characteristics, structures, and functions and corresponding taxonomic classifications.											
Competency 012 (Reproduction and the Mechanisms of Heredity): <i>The teacher understands reproduction and the mechanisms of heredity.</i>											

Required Course Numbers

Test Content Categories											
A. Describe the processes by which plants and animals reproduce and explain how hereditary information is passed from one generation to the next.											
B. Compare and contrast inherited traits and learned characteristics.											
C. Understand the organization of hereditary material and how an inherited trait can be determined by one or many genes and how more than one trait can be influenced by a single gene.											
D. Distinguish between dominant and recessive traits and predict the probable outcomes of genetic combinations.											
E. Evaluate the influence of environmental and genetic factors on the traits of an organism.											
Competency 013 (Adaptations and Evolution): <i>The teacher understands adaptations of organisms and the theory of evolution.</i>											
A. Demonstrate knowledge of adaptive characteristics and explain how adaptations influence the survival of populations or species.											
B. Describe how populations and species change through time.											
C. Describe processes that enable traits to change through time, including selective breeding, mutation and other natural occurrences.											
Competency 014 (Organisms and the Environment): <i>The teacher understands the relationships between organisms and the environment.</i>											

Required Course Numbers											
Test Content Categories											
A. Understand that organisms respond to internal or external stimuli and analyze the role of internal and external stimuli in the behavior of organisms.											
B. Understand relationships between organisms and the environment and describe ways that living organisms depend on each other and on the environment to meet their basic needs.											
C. Identify organisms, populations or species with similar needs and analyze how they compete with one another for resources.											
D. Analyze the interrelationships and interdependence among producers, consumers and decomposers in an ecosystem (e.g., food webs, food chains, competition, predation).											
E. Identify factors that influence the size and growth of populations in an ecosystem.											
F. Analyze adaptive characteristics that result in a population's or species' unique niche in an ecosystem.											
G. Know how populations and species modify and affect ecosystems.											
Competency 015 (Structure and Function of Earth Systems): <i>The teacher understands the structure and function of Earth systems.</i>											
A. Understand the structure of Earth and analyze constructive and destructive processes (including plate tectonics, weathering and erosion) that produce geologic change, including how these processes have affected Earth history.											

Required Course Numbers											
Test Content Categories											
B. Understand the form and function of surface water and groundwater.											
C. Apply knowledge of the composition and structure of the atmosphere and its properties.											
D. Apply knowledge of how human activity and natural processes, both gradual and catastrophic, can alter Earth systems.											
Competency 016 (Cycles in Earth Systems): <i>The teacher understands cycles in Earth systems.</i>											
A. Understand the rock cycle and how rocks, minerals and soils are formed, and their respective properties.											
B. Understand the water cycle and its relationship to weather processes.											
C. Understand the nutrient (e.g., carbon, nitrogen) cycle and its relationship to Earth systems.											
D. Apply knowledge of how human and natural processes affect Earth systems.											
E. Understand and describe the properties and uses of Earth materials (e.g., rocks, soils, water, atmospheric gases).											
Competency 017 (Energy in Weather and Climate): <i>The teacher understands the role of energy in weather and climate.</i>											
A. Understand the elements of weather (e.g., humidity, wind speed and direction, air pressure, temperature) and the tools used for measurement.											
B. Compare and contrast weather and climate.											

Required Course Numbers											
Test Content Categories											
C. Analyze weather charts and data to make weather predictions.											
D. Apply knowledge of how transfers of energy between Earth systems affect weather and climate.											
E. Analyze how Earth’s position, orientation, and surface features affect weather and climate.											
Competency 018 (Solar System and the Universe): <i>The teacher understands the characteristics of the solar system and the universe.</i>											
A. Understand the properties and characteristics of objects in the sky.											
B. Apply knowledge of the Earth–Moon–Sun system and the interactions among them (e.g., day and night, seasons, lunar phases, eclipses).											
C. Identify properties of the components of the solar system.											
Subject V – Fine Arts, Health and Physical Education (905)											
Competency 001 (Visual Arts): <i>The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of art and uses that knowledge to plan and implement effective and engaging visual arts instruction.</i>											
A. Know how to involve students in activities that promote enjoyment and understanding of visual arts by providing students with a wide range of opportunities to create and respond to visual arts so that they develop visual arts literacy.											

Required Course Numbers

Test Content Categories											
B. Know and understand how perception is developed through observation, prior knowledge, imaginative and cognitive processes and multisensory experiences.											
C. Select and use instructional strategies, materials and activities to help students deepen and expand their ability to perceive and reflect on the environment.											
D. Know and understand how critical thinking and creative problem solving are applied in the perception of artworks.											
E. Demonstrate knowledge of the elements of art (i.e., color, texture, shape, form, line, space, value) and provide instruction that promotes students' understanding of the elements of art as well as students' ability to apply that understanding in creating original artworks.											
F. Demonstrate knowledge of the principles of art (e.g., emphasis, contrast, pattern, rhythm, balance, proportion, unity) and provide instruction that promotes students' understanding of the principles of art as well as students' ability to apply that understanding in creating original artworks.											
G. Select appropriate techniques to create art in various media (e.g., drawing, painting, printmaking, construction, ceramics, fiber art, electronic media) and promote students' ability to use those techniques in creating original artworks.											
H. Understand how different cultures use art elements and principles to create art and convey meaning in different ways.											

Required Course Numbers

Test Content Categories											
I. Select and use instructional strategies, materials and activities to promote students' awareness and appreciation of the characteristics of a variety of art forms of multiple cultures within and outside the Western tradition.											
J. Provide instruction to develop the skills and knowledge required for visual literacy (e.g., art elements and principles, art of different areas and cultures, diverse purposes and uses of art).											
K. Integrate instruction in the visual arts with instruction in other subject areas.											
L. Understand how students develop cognitively and artistically and know how to implement effective art instruction and assessment that are individually, culturally and age appropriate.											
M. Apply knowledge of visual arts content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and knowledge of students in early childhood through grade six to plan and implement effective, developmentally appropriate art instruction.											
<i>Competency 002 (Music): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of music and uses that knowledge to plan and implement effective and engaging music instruction.</i>											
A. Know how to involve students in activities that promote enjoyment and understanding of music by providing students with a wide range of opportunities to make and respond to music so that they develop music literacy (e.g., concert attendance, authentic performance opportunities).											

Required Course Numbers

Test Content Categories											
B. Apply knowledge of standard terminology for describing and analyzing musical sound (e.g., rhythm, melody, form, timbre, tempo, pitch, meter, dynamics, intonation, intervals) and have a basic understanding of how to read, write, recognize aurally and interpret standard music notation.											
C. Know how to arrange vocal and instrumental music for specific purposes and settings (e.g., guides students in creating simple song arrangements and accompaniments using voices, classroom percussion, and melody instruments).											
D. Know and understand music of diverse genres, styles and cultures.											
E. Demonstrate an understanding of the purposes and roles of music in society and how music can reflect elements of a specific society or culture.											
F. Explain a variety of music and music-related career options.											
G. Identify and describe how music reflects the heritage of the United States and Texas.											
H. Apply knowledge of criteria for evaluating and critiquing musical performances and experiences, including using standard terminology in communicating about students' musical skills and performance abilities.											
I. Integrate instruction in music with instruction in other subject areas.											
J. Know how to teach students to sing and/or play an instrument with expression, both independently and in small groups.											

Required Course Numbers

Test Content Categories											
<p>K. Apply knowledge of music content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and of students in early childhood through grade six to plan and implement effective, developmentally appropriate instruction, including instruction that promotes students' creativity and performance skills as well as students' ability to use critical-thinking and problem-solving skills in music contexts (e.g., sequential instruction, music composition, improvisation, concert etiquette).</p>											
<p>L. Manage time, instructional resources and physical space effectively for music education.</p>											
<p>Competency 003 (Health): <i>The teacher uses knowledge of the concepts and purposes of health education to plan and implement effective and engaging health instruction.</i></p>											
<p>A. Understand health-related behaviors, ways that personal health decisions and behaviors affect body systems and health and strategies for reducing health risks and enhancing wellness throughout the life span.</p>											
<p>B. Demonstrate knowledge of major areas in health instruction, including body systems and development (e.g., structures and functions of various body systems, relationships among body systems, five senses); illness and disease (e.g., types of disease, transmission mechanisms, defense systems, disease prevention); nutrition (e.g., types of foods and nutrients, maintenance of a balanced diet); stress (e.g., effects of stress, stress-reduction techniques); and fitness (e.g., components of fitness, methods for improving fitness, posture).</p>											

Required Course Numbers											
Test Content Categories											
C. Know and understand stages of human growth and development, including physical and emotional changes that occur during adolescence.											
D. Understand substance use and abuse, including types and characteristics of tobacco, alcohol, other drugs and herbal supplements.											
E. Understand types of violence and abuse, including causes and effects of violence and abuse and ways to prevent and seek help in dealing with violence and abuse.											
F. Select and use instructional strategies, materials and activities to teach principles and procedures related to safety, accident prevention and response to emergencies.											
G. Apply critical-thinking, goal-setting, problem-solving and decision-making skills in health-related contexts (e.g., eating habits, drug use, abstinence) and understand the use of refusal skills and conflict resolution to avoid unsafe situations (e.g., bullying, violence, abuse).											
H. Know and understand strategies for coping with unhealthy behaviors in the family (e.g., abuse, alcoholism, neglect, anxiety, grief).											
I. Understand types and symptoms of eating disorders.											
J. Know how to use various social and communication skills to build and maintain healthy interpersonal relationships (e.g., tolerance, respect, discussing problems with parents/caregivers, showing empathy).											

Required Course Numbers											
Test Content Categories											
K. Understand health care responses to threats to safety, internal injury, early detection and warning signs of illness.											
L. Select and use instructional strategies, materials and activities to help students build healthy interpersonal relationships (e.g., communication skills) and demonstrate consideration and respect for self, family, friends and others (e.g., practicing self-control).											
M. Understand the influence of various factors (e.g., media, technology, peer and other relationships, environmental hazards) on individual (e.g., idealized body images, unhealthy weight-loss plans), family and community health.											
N. Demonstrate knowledge of sources of health information and ways to use information to make health-related decisions.											
O. Select and use instructional strategies, materials and activities to help students understand the roles of health care professionals, the benefits of health maintenance activities and the skills for becoming health-conscious consumers.											
P. Apply knowledge of health content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and of students in early childhood through grade six to plan and implement effective, developmentally appropriate health instruction, including relating the health education curriculum to other content areas.											

Required Course Numbers											
Test Content Categories											
Competency 004 (Physical Education): <i>The teacher uses knowledge of the concepts, principles, skills and practices of physical education to plan and implement effective and engaging physical education instruction.</i>											
A. Apply key principles and concepts in physical education and physical activity (e.g., cardiovascular endurance, muscular strength, flexibility, weight control, conditioning, safety, stress management, nutrition) for the promotion of health and fitness.											
B. Know and help students understand the benefits of an active lifestyle.											
C. Understand appropriate methods, including technological methods, for evaluating, monitoring and improving fitness levels.											
D. Apply knowledge of movement principles and concepts to develop students' motor skills including understanding key elements of mature movement patterns (e.g., throwing, jumping, catching) and various manipulative skills (e.g., volley, dribble, punt, strike).											
E. Select and use developmentally appropriate learning experiences that enhance students' locomotor, nonlocomotor, body control, manipulative and rhythmic skills.											
F. Modify instruction based on students' individual differences in growth and development.											
G. Evaluate movement patterns to help students improve performance of motor skills and to integrate and refine their motor and rhythmic skills.											

Required Course Numbers

Test Content Categories											
H. Understand a variety of strategies and tactics designed to improve students' performance, teamwork and skill combinations in games and sports.											
I. Select and use instructional strategies to promote students' knowledge and application of rules, procedures, etiquette and fair play in developmentally appropriate games and activities.											
J. Design, manage and adapt physical education activities to promote positive interactions and active engagement by all students.											
K. Understand areas of diverse needs (e.g., physical and emotional challenges, learning disabilities, sensory difficulties, language differences) and their implications for teaching and learning.											
L. Apply knowledge of physical education content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and knowledge of students in early childhood through grade six to plan, implement and assess effective, developmentally appropriate physical education activities.											
Competency 005 (Theatre): <i>The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of theatre and uses that knowledge to plan and implement effective and engaging theatre instruction.</i>											
A. Know and understand how perception is developed through the use of elements of drama and conventions of theatre.											

Required Course Numbers

Test Content Categories											
B. Know how to involve students in activities that promote enjoyment and understanding of theatre arts by selecting and using instructional strategies, materials and activities to help students interpret creative expression and performance.											
C. Demonstrate the knowledge of the elements of theatre (i.e., dramatic play, expressive movement, voice, characterization) and theatre occupations, provide instruction that promotes students' understanding of the elements and occupations, and help them apply that understanding in creating theatrical productions.											
D. Integrate instruction in theatre with instruction in other subject areas.											
E. Know how to promote students' ability to identify and use technical elements (e.g., properties, scenery, sound, costumes, lighting) to create suitable environments for dramatic play and performance.											
F. Knows how to promote students' ability to identify and use technical elements (e.g., properties, scenery, sound, costumes, lighting) to define and enhance characterization, mood, theme and setting.											
G. Understand how theatre relates to history, society and the diverse cultures.											
H. Apply knowledge of theatre content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and knowledge of students in early childhood through grade six to plan and implement effective, developmentally appropriate theatre instruction.											

Required Course Numbers											
Test Content Categories											
I. Manage time, instructional resources and physical space effectively for theatre education.											