# Table of Contents

**CONTENT AREA—READING, LANGUAGE ARTS AND LITERATURE**

**SUBAREA I. LANGUAGE AND LINGUISTICS**

**COMPETENCY 1.0 LANGUAGE STRUCTURE AND LINGUISTICS**

<table>
<thead>
<tr>
<th>Skill 1.1</th>
<th>Identify and demonstrate an understanding of the fundamental components of human language, including phonology, morphology, syntax, and semantics, as well as the role of pragmatics in using language to communicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill 1.2</td>
<td>Candidates can demonstrate knowledge of phonemic awareness and apply knowledge of similarities and differences among groups of phonemes that vary in their placement and manner of articulation.</td>
</tr>
<tr>
<td>Skill 1.3</td>
<td>Candidates know the differences between phoneme awareness and phonics.</td>
</tr>
<tr>
<td>Skill 1.4</td>
<td>Know the predictable patterns of sound-symbol and symbol-sound relationships in English.</td>
</tr>
<tr>
<td>Skill 1.5</td>
<td>Identify examples of parts of speech, and their functions, as well as the morphology contributing to their classification.</td>
</tr>
<tr>
<td>Skill 1.6</td>
<td>Recognize and use syntactic components to understand and develop a variety of sentence types.</td>
</tr>
</tbody>
</table>

**COMPETENCY 2.0 LANGUAGE DEVELOPMENT AND ACQUISITION**

| Skill 2.1 | Apply knowledge of both the development of a first language and the acquisition of subsequent ones, as well as describe the principal observable milestones in each domain, and identify the major theories that attempt to explain the processes of development and acquisition. |
| Skill 2.2 | Candidates demonstrate that they understand the range of issues related to the interaction of first languages and other languages. |
| Skill 2.3 | Recognize special features that may identify a pupil’s language development as exceptional, distinguishing such features from inter-language effects. |
COMPETENCY 3.0 LITERACY

Skill 3.1 Understand and use the major descriptions of developing literacy....15

Skill 3.2 In both English speakers and English learners, identify the progressive development of phonemic awareness, decoding, comprehension, word recognition, and spelling.................................20

Skill 3.3 Understand how these processes interact with the development of concepts, of vocabulary and of contextual analysis.........................23

COMPETENCY 4.0 ASSESSMENT

Skill 4.1 Apply knowledge of the implications that language development and differences have for the processes of learning to read and reading to learn .................................................................25

Skill 4.2 Know and apply a range of assessment methods and instruments to the respective and interrelated developing abilities in listening, speaking, reading vocabulary, and spelling conventions. .............26

SUBAREA II. NON-WRITTEN AND WRITTEN COMMUNICATION

COMPETENCY 5.0 CONVENTIONS OF LANGUAGE

Skill 5.1 Identify and use the conventions associated with what is called standard English.................................................................28

Skill 5.2 Recognize, understand, and use a range of conventions in both spoken and written English, including varieties of sentence structure, preferred usage and conventional forms of spelling, capitalization and punctuation in written English ..................37

COMPETENCY 6.0 WRITING STRATEGIES

Skill 6.1 Describe the stages of the writing process ................................................38

Skill 6.2 Understand the purpose and techniques of various prewriting strategies .................................................................39

Skill 6.3 Revise and edit writing, drawing upon their understanding of principles of organization, transitions, point-of-view, word choices, and conventions .................................................................41
COMPETENCY 7.0 WRITING APPLICATIONS

Skill 7.1 Demonstrate their knowledge of principles of composition, such as paragraphing, transitional phrases, appropriate vocabulary, and context.

Skill 7.2 Compose and/or analyze writing according to conventions in different genres, including narrative, interpretive, descriptive, persuasive and expository writing, as well as summaries, letters, and research reports.

Skill 7.3 Understand and are able to use bibliographic citations in a standard format.

COMPETENCY 8.0 NON-WRITTEN COMMUNICATION

Skill 8.1 Demonstrate knowledge of non-written genres and traditions, and their characteristics, including narratives, persuasive pieces, research presentations, poetry recitations, and responses to literature.

Skill 8.2 Apply understandings of language development stages, from pre-production to intermediate fluency, to children’s developing abilities in such areas.

Skill 8.3 Analyze speech in terms of presentation components pronunciation fluency, and identify the integration of nonverbal components with verbal elements.

Skill 8.4 Demonstrate knowledge of dialects, idiolects, and changes in what is considered standard oral English usage and their effects on perceptions of speaker performance, with attention to the dangers of stereotyping and bias.

Skill 8.5 Demonstrate an understanding of the potential impact on non-written presentations of images, sound, and other features from electronic media.

COMPETENCY 9.0 RESEARCH STRATEGIES

Skill 9.1 Use a variety of research sources, both print and electronic.

Skill 9.2 Interpret such research, putting to use their findings and interpretations to construct their own reports and narratives.
Skill 9.3 Understand the importance of citing research sources, using recognizable and accepted conventions for doing so. ..........................59

SUBAREA III. TEXTS

COMPETENCY 10.0 CONCEPTS AND CONVENTIONS ........................................60

Skill 10.1 Analyze narrative and expository texts, with special attention to children’s literature, from a range of cultures, for both literary elements and structural features ..........................................................60

Skill 10.2 Identify themes derived from cultural patterns and symbols found in rituals, mythologies, and traditions ..................................................61

Skill 10.3 Identify and analyze evidence of an author’s or narrator’s perspective in both fiction and non-fiction .................................................62

Skill 10.4 Identify and evaluate structural devices in prose and poetry and then examine the connections among organizational structures, the writer’s viewpoint, and the goals of reading ........................................64

COMPETENCY 11.0 GENRES ..............................................................................71

Skill 11.1 Analyze texts in different literary genres as they are represented in different cultures, according to their structure, organization, and purpose. ..................................................................................71

Skill 11.2 Demonstrate an understanding of structural features and their applications in various types of expository and narrative materials, including popular media such as magazines and newspapers ........74

Skill 11.3 Understand and evaluate the use of elements of persuasive argument in print, speech, videos, and in other media ..................74

COMPETENCY 12.0 INTERPRETATION OF TEXTS ............................................76

Skill 12.1 Analyze both implicit and explicit themes and interpret both literal and figurative meanings in texts, from a range of cultures and genres, using textual support for inferences, conclusions, and generalizations they draw from any work ........................................76

Skill 12.2 Evaluate the structure, purpose, and potential uses of visual text features, such as graphics, illustrations, and maps ..................77
Skill 12.3 Recognize and analyze instances of bias and stereotyping in a text. 78

CONTENT AREA II–SOCIAL SCIENCE

SUBAREA I. WORLD HISTORY

COMPETENCY 13.0 ANCIENT CIVILIZATIONS 79

Skill 13.1 Trace the impact of physical geography on the development of ancient civilizations 79

Skill 13.2 Identify the intellectual contributions, artistic forms, and traditions of these civilizations 81

Skill 13.3 Recognize patterns of trade and commerce that influenced these civilizations 83

COMPETENCY 14.0 MEDIEVAL AND EARLY MODERN TIMES 84

Skill 14.1 Describe the influence of physical geography on the development of medieval and early modern civilizations 84

Skill 14.2 Trace the decline of the Western Roman Empire and the development of feudalism as a social and economic system in Europe and Japan 84

Skill 14.3 Identify the art, architecture, and science of Pre-Columbian America 86

Skill 14.4 Describe the role of Christianity in medieval and early modern Europe, its expansion beyond Europe, and the role of Islam and its impact on Arabia, Africa, Europe and Asia 86

Skill 14.5 Trace the development of the Renaissance and Scientific Revolution in Europe 88

Skill 14.6 Define the development of early modern capitalism and its global consequences 89

Skill 14.7 Describe the evolution of the idea of representative democracy from the Magna Carta through the Enlightenment 89
SUBAREA II. UNITED STATES HISTORY

COMPETENCY 15.0 EARLY EXPLORATION, COLONIAL ERA, AND THE WAR FOR INDEPENDENCE .............................................. 91

Skill 15.1 Identify and describe European exploration and settlement, and the struggle for control of North America during the Colonial Era, including cooperation and conflict among American Indians and new settlers. .......................................................... 91

Skill 15.2 Identify the founders and discuss their religious, economic and political reasons for colonization of North America. ......................... 92

Skill 15.3 Describe European colonial rule and its relationship with American Indian societies. ................................................................. 93

Skill 15.4 Describe the development and institutionalization of African slavery in the western hemisphere and its consequences in Sub-Saharan Africa. ......................................................... 94

Skill 15.5 Describe the causes of the War for Independence, elements of political and military leadership, the impact of the war on Americans, the role of France, and the key ideas embodied within the Declaration of Independence. ................................................................. 94

COMPETENCY 16.0 THE DEVELOPMENT OF THE CONSTITUTION AND THE EARLY REPUBLIC ..................................................... 98

Skill 16.1 Describe the political system of the United States and the ways that citizens participate in it through executive, legislative and judicial processes. ................................................................. 98

Skill 16.2 Define the Articles of Confederation and the factors leading to the development of the U.S. Constitution, including the Bill of Rights ..... 99

Skill 16.3 Explain the major principles of government and political philosophy contained within the Constitution, especially separation of powers and federalism.......................................................... 100

Skill 16.4 Trace the evolution of political parties, describe their differing visions for the country, and analyze their impact on economic development policies ......................................................... 101

Skill 16.5 Identify historical, cultural, economic and geographic factors that led to the formation of distinct regional identities........................................ 102
Skill 16.6 Describe the westward movement, expansion of U.S. borders, and
government policies toward American Indians and foreign nations
during the Early Republic .................................................................104

Skill 16.7 Identify the roles of Blacks (both slave and free), American Indians,
the Irish and other immigrants, and women and children in the
political, cultural and economic life of the new country. .................105

COMPETENCY 17.0 CIVIL WAR AND RECONSTRUCTION ......................... 106

Skill 17.1 Recognize the origin and the evolution of the anti-slavery
movement, including the roles of free Blacks and women, and the
response of those who defended slavery ..........................................106

Skill 17.2 Describe evidence for the economic, social and political causes of
the Civil War, including the constitutional debates over the doctrine
of nullification and secession. ...........................................................107

Skill 17.3 Identify the major battles of the Civil War and the comparative
strengths and weaknesses of the Union and the Confederacy. ........111

Skill 17.4 Describe the character of Reconstruction, factors leading to its
abandonment, and the rise of Jim Crow practices.........................114

COMPETENCY 18.0 THE RISE OF INDUSTRIAL AMERICA ..................... 116

Skill 18.1 Recognize the pattern of urban growth in the United States, the
impact of successive waves of immigration in the nineteenth
century, and the response of renewed nativism ..............................116

Skill 18.2 Understand the impact of major inventions on the Industrial
Revolution and the quality of life........................................................118

SUBAREA III. CALIFORNIA HISTORY

COMPETENCY 19.0 THE PRE-COLUMBIAN PERIOD THROUGH THE
GOLD RUSH ................................................................. 120

Skill 19.1 Identify the impact of California’s physical geography on its
history. .................................................................................................120

Skill 19.2 Describe the geography, economic activities, folklore and religion
of California’s American Indian peoples. .........................................121
Skill 19.3 Discuss the impact of Spanish exploration and colonization, including the mission system and its influence on the development of the agricultural economy of early California.................................122

Skill 19.4 Describe Mexican rule in California.................................................................123

Skill 19.5 State the causes of the war between Mexico and the United States and its consequences for California.................................................................124

Skill 19.6 Describe the discovery of gold and its cultural, social, political and economic effects in California, including its impact on American Indians and Mexican nationals ................................................126

COMPETENCY 20.0 ECONOMIC, POLITICAL AND CULTURAL DEVELOPMENT SINCE THE 1850S .........................127

Skill 20.1 Identify key principles of the California Constitution, including the Progressive-era reforms of initiative, referendum and recall, and then recognize similarities and differences between it and the U. S. Constitution. .................................................................127

Skill 20.2 Identify patterns of immigration to California, including the Dust Bowl migration, and discuss their impact on the cultural, economic, social and political development of the state. ........................................129

Skill 20.3 Identify the effects of federal and state law on the legal status of immigrants ..................................................................................................................131

Skill 20.4 Describe historical and contemporary perspectives on cultural diversity in the United States and in California. .........................................................132

Skill 20.5 Understand the development and identify the locations of California’s major economic activities: mining, large-scale agriculture, entertainment, recreation, aerospace, electronics and international trade ........................................................................133

Skill 20.6 Identify factors leading to the development of California’s water delivery system, and describe its relationship to California geography. .................................................................134

COMPETENCY 21.0 SKILLS AND ABILITIES .........................................................136

Skill 21.1 Utilize chronological and spatial thinking. .........................................................136

Skill 21.2 Construct and interpret timelines, tables, graphs, maps and charts. .136
Skill 21.3 Locate places based on ordinal directions, latitude and longitude, the equator, prime meridian, the tropics, the hemispheres, time zones and the international dateline. ...........................................139

Skill 21.4 Identify and interpret major geographical features of the earth’s surface including continents and other large landmasses, mountain ranges, forested areas, grasslands, deserts and major bodies of water and rivers.................................................................140

Skill 21.5 Describe the cultural, historical, economic and political characteristics of world regions, including human features of the regions such as population, land use patterns and settlement patterns. .....................................................................................142

Skill 21.6 Analyze, interpret and evaluate research evidence in history and the social sciences. ........................................................................................................144

Skill 21.7 Interpret primary and secondary sources, including written documents, narratives, photographs, art and artifacts revealed through archeology...........................................................................144

Skill 21.8 Assess textbooks and contrast differing points of view on historic and current events.................................................................146

Skill 21.9 Identify, explain and discuss multiple causes and effects.........................146

Skill 21.10 Recognize the differing ramifications of historical and current events for people of varying ethnic, racial, socio-economic, cultural and gender backgrounds. .................................................................147

Skill 21.11 Draw on and apply concepts from history and other social studies including political science and government, geography, economics, anthropology, and sociology. ................................148

Skill 21.12 Explain concepts related to human, government and political institutions, including power and authority, monarchy, totalitarianism, republicanism, democracy, limited government and the roles and responsibilities of citizenship. ........................................150

Skill 21.13 Draw on and apply basic economic concepts........................................152

Skill 21.14 Discuss basic concepts of sociology related to individuals, interpersonal relationships and institutions, including family and community; and concepts related to social structure, including occupation, socio-economic class, ethnicity and gender.......................153
Skill 21.15 Explain major concepts of philosophy (including concepts of religion and other belief systems) and their impact on history and society. ...154
Skill 21.16 Explain basic concepts of demography including factors associated with human migration. .................................................................156
Skill 21.17 Discuss basic concepts of anthropology including the nature and content of culture, understand the historical and cultural development of human society, including hunting and gathering, nomadic pastoralism, domestication of plants and animals, and the creation and evolution of human settlements and cities. .............157

CONTENT AREA—MATHEMATICS

SUBAREA I. NUMBER SENSE

COMPETENCY 22.0 NUMBERS, RELATIONSHIPS AMONG NUMBERS AND NUMBER SYSTEMS .......................................................... 158
Skill 22.1 Understand base ten place value, number theory concepts and the structure of the whole, integer, rational, and real number systems. ..158
Skill 22.2 Order integers, mixed numbers, rational numbers and real numbers. ................................................................................159
Skill 22.3 Represent numbers in exponential and scientific notation. ...........160
Skill 22.4 Describe the relationships between the algorithms for addition, subtraction, multiplication, and division ..............................162
Skill 22.5 Understand properties of number systems and their relationship to the algorithms .....................................................................163
Skill 22.6 Perform operations with positive, negative, and fractional exponents, as they apply to whole numbers and fractions. ..............164

COMPETENCY 23.0 COMPUTATIONAL TOOLS, PROCEDURES AND STRATEGIES .................................................................179
Skill 23.1 Demonstrate fluency in standard algorithms for computation and evaluate the correctness of nonstandard algorithms. .................179
Skill 23.2 Demonstrate an understanding of the order of operations. ..........179
Skill 23.3  Round numbers, estimate the results of calculations, and place numbers accurately on a number line. ..............................................180

Skill 23.4  Demonstrate the ability to use technology, such as calculators or software, for complex calculations.....................................................180

**SUBAREA II. ALGEBRA AND FUNCTIONS**

**COMPETENCY 24.0 PATTERNS AND FUNCTIONAL RELATIONSHIPS ..........181**

Skill 24.1  Represent patterns, including relations and functions, through tables, graphs, verbal rules, or symbolic rules. .................................181

Skill 24.2  Use proportional reasoning such as ratios, equivalent fractions, and similar triangles, to solve numerical, algebraic, and geometric problems...........................................................................182

**COMPETENCY 25.0 LINEAR AND QUADRATIC EQUATIONS AND INEQUALITIES .................................................................183**

Skill 25.1  Able to find equivalent expressions for equalities and inequalities, Explain the meaning of symbolic expressions on graphs. ..............183

Skill 25.2  Recognize and create equivalent algebraic expressions and represent geometric problems algebraically ..............................................185

Skill 25.3  Have a basic understanding of linear equations and their properties; the multiplication, division, and factoring of polynomials; and graphing and solving quadratic equations through factoring and completing the square. ........................................................................187

Skill 25.4  Interpret graphs of linear and quadratic equations and inequalities, including solutions to systems of equations..................................190

**SUBAREA III. MEASUREMENT AND GEOMETRY**

**COMPETENCY 26.0 TWO AND THREE-DIMENSIONAL GEOMETRIC OBJECTS .................................................................195**

Skill 26.1  Understand characteristics of common two- and three-dimensional figures, such as triangles, quadrilaterals, and spheres..................195

Skill 26.2  Able to draw conclusions based on the congruence, similarity, or lack thereof, of two figures.................................................................197
<table>
<thead>
<tr>
<th>Skill</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.3</td>
<td>Identify different forms of symmetry, translations, rotations, and reflections</td>
<td>199</td>
</tr>
<tr>
<td>26.4</td>
<td>Understand the Pythagorean theorem and its converse</td>
<td>201</td>
</tr>
<tr>
<td>26.5</td>
<td>Able to work with properties of parallel lines</td>
<td>204</td>
</tr>
<tr>
<td>27.0</td>
<td><strong>COMPETENCY 27.0 REPRESENTATIONAL SYSTEMS, INCLUDING CONCRETE MODELS, DRAWINGS AND COORDINATE GEOMETRY</strong></td>
<td>205</td>
</tr>
<tr>
<td>27.1</td>
<td>Use concrete representations, such as manipulatives, drawings, and coordinate geometry to represent geometric objects</td>
<td>205</td>
</tr>
<tr>
<td>27.2</td>
<td>Construct basic geometric figures using a compass and straightedge, and represent three-dimensional objects through two-dimensional drawings</td>
<td>206</td>
</tr>
<tr>
<td>27.3</td>
<td>Combine and dissect two- and three-dimensional figures into familiar shapes, such as dissecting a parallelogram and rearranging the pieces to form a rectangle of equal area.</td>
<td>207</td>
</tr>
<tr>
<td>28.0</td>
<td><strong>COMPETENCY 28.0 TECHNIQUES, TOOLS, AND FORMULAS FOR DETERMINING MEASUREMENTS</strong></td>
<td>208</td>
</tr>
<tr>
<td>28.1</td>
<td>Estimate and measure time, length, angles, perimeter, area, surface area, volume, weight/mass, and temperature through appropriate units and scales</td>
<td>208</td>
</tr>
<tr>
<td>28.2</td>
<td>Identify relationships between different measures within the metric or customary systems of measurements and estimate an equivalent measurement across the two systems</td>
<td>209</td>
</tr>
<tr>
<td>28.3</td>
<td>Calculate perimeters and areas of two-dimensional objects and surface areas and volumes of three-dimensional objects</td>
<td>212</td>
</tr>
<tr>
<td>28.4</td>
<td>Relate proportional reasoning to the construction of scale drawings or models</td>
<td>217</td>
</tr>
<tr>
<td>28.5</td>
<td>Use measures such as miles per hour to analyze and solve problems</td>
<td>218</td>
</tr>
</tbody>
</table>
SUBAREA IV. STATISTICS, DATA ANALYSIS AND PROBABILITY

COMPETENCY 29.0 COLLECTION, ORGANIZATION, AND REPRESENTATION OF DATA ...........................................221

Skill 29.1 Represent a collection of data through graphs, tables, or charts. .....221

Skill 29.2 Understand the mean, median, mode, and range of a collection of data. ........................................................223

Skill 29.3 Have a basic understanding of the design of surveys, such as the role of a random sample.................................224

COMPETENCY 30.0 INFERENCES, PREDICTIONS AND ARGUMENTS BASED ON DATA ...........................................225

Skill 30.1 Interpret a graph, table, or chart representing a data set. ...........225

Skill 30.2 Draw conclusions about a population from a random sample, and identify potential sources and effects of bias. ......................226

COMPETENCY 31.0 BASIC NOTIONS OF CHANCE AND PROBABILITY 228

Skill 31.1 Define the concept of probability in terms of a sample space of equally likely outcomes. .............................................228

Skill 31.2 Use their understanding of complementary, mutually exclusive, dependent, and independent events to calculate probabilities of simple events ........................................................................228

Skill 31.3 Express probabilities in a variety of ways, including ratios, proportions, decimals, and percents.................................229

COMPETENCY 32.0 SKILLS AND ABILITIES ........................................230

Skill 32.1 Identify and prioritize relevant and missing information in mathematical problems. ...................................................230

Skill 32.2 Analyze complex problems to identify similar simple problems that might suggest solution strategies. ..............................232

Skill 32.3 Represent a problem in alternate ways, such as words, symbols, concrete models, and diagrams, to gain greater insight. ..........233

Skill 32.4 Consider examples and patterns as means to formulating a conjecture.......................................................................234
Skill 32.5  Apply logical reasoning and techniques from arithmetic, algebra, geometry, and probability/statistics to solve mathematical problems............................................................................................ 234

Skill 32.6  Analyze problems to identify alternative solution strategies .............. 235

Skill 32.7  Evaluate the truth of mathematical statements........................................ 236

Skill 32.8  Apply different solution strategies to check the reasonableness of a solution ................................................................................................................. 237

Skill 32.9  Demonstrate that a solution is correct ................................................ 238

Skill 32.10  Explain their mathematical reasoning through a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and concrete models. ............................................................. 239

Skill 32.11  Use appropriate mathematical notation with clear and accurate language .......................................................................................................................... 240

Skill 32.12  Explain how to derive a result based on previously developed ideas, and explain how a result is related to other ideas. ......................... 241

CONTENT AREA—SCIENCE

SUBAREA I. PHYSICAL SCIENCE

COMPETENCY 33.0 STRUCTURE AND PROPERTIES OF MATTER .............. 242

Skill 33.1  Understand the physical properties of solids, liquids, and gases, such as color, mass, density, hardness, and electrical and thermal conductivity. ......................................................................................... 242

Skill 33.2  Know that matter can undergo physical changes and chemical changes ............................................................................................................................ 243

Skill 33.3  Know that matter consists of atoms and molecules in various arrangements, and can give the location and motions of the parts of an atom .............................................................................................. 244

Skill 33.4  Describe the constituents of molecules and compounds, naming common elements and explain how elements are organized on the Periodic Table on the basis of their atomic and chemical properties. ........................................................................................................ 246
Skill 33.5 Describe characteristics of solutions and then know examples with different pH levels such as soft drinks, liquid detergents, and water. .................................................................248

Skill 33.6 Know that mixtures may often be separated based on physical or chemical properties. .................................................................251

COMPETENCY 34.0 PRINCIPLES OF MOTION AND ENERGY ...............252

Skill 34.1 Describe an object's motion based on position, displacement, speed, velocity, and acceleration. .................................................252

Skill 34.2 Know that forces such as gravity, magnetism, and friction act on objects and may change their motion if these forces are not in balance. ..................................................................................253

Skill 34.3 Know that "like" electrical charges or magnetic poles produce repulsive forces and "unlike" charges or poles produce attractive forces.................................................................................................254

Skill 34.4 Describe simple machines in which small forces are exerted over long distances to accomplish difficult tasks ........................................256

Skill 34.5 Identify forms of energy including solar, chemical, electrical, magnetic, nuclear, sound, light, and electromagnetic. .........................257

Skill 34.6 Know that total energy in a system is conserved but may be changed from one form to another, as in an electrical motor or generator. .........................................................................................259

Skill 34.7 Understand the difference between heat and temperature, and understand temperature measurement systems. ..........................260

Skill 34.8 Know how heat may be transferred by conduction, convection, and radiation .................................................................262

Skill 34.9 Describe sources of light including the sun, light bulbs, or excited atoms and interactions of light with matter .................................264

Skill 34.10 Know and can apply the optical properties of waves, especially light and sound, including reflection or refraction .........................265

Skill 34.11 Explain conservation of energy resources in terms of renewable and non-renewable natural resources and their use in society.......267
SUBAREA II. LIFE SCIENCE

COMPETENCY 35.0 STRUCTURE OF LIVING ORGANISMS AND THEIR FUNCTION

Skill 35.1 Describe levels of organization and related functions in plants and animals, including, organ systems organs, tissues cells, and subcellular organelles ............................................................. 270

Skill 35.2 Know structures and related functions of systems in plants and animals, such as reproductive, respiratory, circulatory, and digestive ................................................................. 270

Skill 35.3 Understand principles of chemistry underlying the functioning of biological systems ............................................................ 272

COMPETENCY 36.0 LIVING AND NON-LIVING COMPONENTS IN ENVIRONMENTS

Skill 36.1 Know the characteristics of many living organisms ......................... 275

Skill 36.2 Understand the basic needs of all living organisms and can distinguish between environmental adaptations and accommodations ............................................................. 277

Skill 36.3 Describe the relationship between the number and types of organisms an ecosystem can support and relationships among members of a species and across species. .............................. 278

Skill 36.4 Illustrate the flow of energy and matter through an ecosystem from sunlight to food chains and food webs ................................................. 281

Skill 36.5 Identify the resources available in an ecosystem, and describe the environmental factors that support the ecosystem, such as temperature, water, and soil composition. .............................. 282

COMPETENCY 37.0 LIFE CYCLE, REPRODUCTION AND EVOLUTION

Skill 37.1 Diagram life cycles of familiar organisms ........................................ 283

Skill 37.2 Explain the factors that affect the growth and development of plants, such as light, gravity, and stress. ......................................................... 285
Skill 37.3  Distinguish between sexual and asexual reproduction, and understand the process of cell division, the types of cells and their functions, and the replication of plants and animals ........................................286

Skill 37.4  Distinguish between environmental and genetic sources of variation, and understand the principles of natural and artificial selection .................................................................................................................291

Skill 37.5  Know how evidence from the fossil record, comparative anatomy, and DNA sequences can be used to support the theory that life gradually evolved on earth over billions of years. ..........................293

Skill 37.6  Understand the basis of Darwin’s theory that species evolved by a process of natural selection..........................................................................................................................296

SUBAREA III. EARTH AND SPACE SCIENCE

COMPETENCY 38.0 THE SOLAR SYSTEM AND THE UNIVERSE .................297

Skill 38.1  Identify and describe the planets, their motion, and that of other planetary bodies around the sun ..........................................................................................................................297

Skill 38.2  Explain time zones in terms of longitude and the rotation of the earth, and understand the reasons for changes in the observed position of the sun and moon in the sky during the course of the day and from season to season ........................................................................................................300

Skill 38.3  Name and describe bodies in the universe including the sun, stars, and galaxies.................................................................................................................................302

COMPETENCY 39.0 THE STRUCTURE AND COMPOSITION OF THE EARTH .........................................................................................304

Skill 39.1  Describe the formation and observable physical characteristics of minerals and different types of rocks ..........................................................................................................................304

Skill 39.2  Identify characteristics of landforms, such as mountains, rivers, deserts, and oceans. ..............................................................................................................................306

Skill 39.3  Explain chemical and physical weathering, erosion, deposition, and other rock forming and soil changing processes and the formation and properties of different types of soils and rocks. ....................................306

Skill 39.4  Describe layers of the earth and plate tectonics, including its convective source. .................................................................................................................................307
TEACHER CERTIFICATION STUDY GUIDE

Skill 39.5  Explain how mountains are created and why volcanoes and earthquakes occur, and describe their mechanisms and effects. 308

Skill 39.6  Know the commonly cited evidence supporting the theory of plate tectonics 310

Skill 39.7  Identify factors influencing the location and intensity of earthquakes, and describe the effects of plate tectonic motion over time on climate, geography, and distribution of organisms, as well as more general changes on the earth over geologic time as evidenced in landforms and the rock and fossil records, including plant and animal extinction. 310

COMPETENCY 40.0 THE EARTH’S ATMOSPHERE 312

Skill 40.1  Explain the influence and role of the sun and oceans in weather and climate and the role of the water cycle, and describe causes and effects of air movements and ocean currents on daily and seasonal weather and on climate. 312

COMPETENCY 41.0 THE EARTH’S WATER 314

Skill 41.1  Compare the characteristics of bodies of water, such as rivers, lakes, oceans, and estuaries and describe tides and explain the mechanisms causing and modifying them, such as the gravitational attraction of the moon, sun, and coastal topography. 314

COMPETENCY 42.0 SKILLS AND ABILITIES 315

Skill 42.1  Know how to plan and conduct a scientific investigation to test a hypothesis 315

Skill 42.2  Apply principles of experimental design, including formulation of testable questions and hypotheses, and evaluation of the accuracy and reproducibility of data 316

Skill 42.3  Distinguish between dependent and independent variables and controlled parameters, and between linear and nonlinear relationships on a graph of data. 318

Skill 42.4  Use scientific vocabulary appropriately 318

Skill 42.5  Select and use a variety of scientific tools 321

Skill 42.6  Know how to record length, mass, and volume measurements using the metric system. 322
Skill 42.7  Interpret results of experiments and interpret events by sequence and time ............................................................322

Skill 42.8  Communicate the steps in an investigation, record data, and interpret and analyze numerical and non-numerical results using charts, maps, tables, models, graphs, and labeled diagrams. ..........323

Skill 42.9  Make appropriate use of print and electronic resources, including the World Wide Web, in preparing for an investigative activity. .........323

Skill 42.10 Communicate the steps and results of a scientific investigation in both verbal and written formats. .....................................................327

CONTENT AREA–VISUAL AND PERFORMING ARTS

SUBAREA I. DANCE

COMPETENCY 43.0 DANCE .................................................................328

Skill 43.1  Identify the components and strands of dance education found in the Visual and Performing Arts Framework and Student Academic Content Standards. ..................................................328

Skill 43.2  Demonstrate a basic fluency with the elements of dance such as space, time, levels, and force/energy. .............................................328

Skill 43.3  Use basic techniques to create dance/movement with children. .......329

Skill 43.4  While grounded in the elements of dance, candidates are able to identify and explain styles of dance from a variety of times, places, and cultures.................................................................329

Skill 43.5  Able to make judgments about dance works based on the elements of dance............................................................................331

SUBAREA II. MUSIC

COMPETENCY 44.0 MUSIC .................................................................332

Skill 44.1  Understand the components and strands of music education found in the Visual and Performing Arts Framework and Student Academic Content Standards. ..................................................332
Skill 44.2 Demonstrate a basic fluency with the elements of music such as pitch, rhythm, and timbre and music concepts, including music notation. .................................................................333

Skill 44.3 Use basic techniques to create vocal and instrumental music with children. .................................................................334

Skill 44.4 Able to identify and explain styles and types of music and instruments from a variety of times, places and cultures. .................335

Skill 44.5 Able to make judgments about musical works based on the elements and concepts of music. ..............................................337

SUBAREA III. THEATRE

COMPETENCY 45.0 THEATRE ..................................................................................338

Skill 45.1 Identify the components and strands of theatre education found in the Visual and Performing Arts Framework and Student Academic Content Standards. .................................................................338

Skill 45.2 Demonstrate a basic fluency in acting, directing, design, and scriptwriting (plot and action), and applying these elements and principles in order to create dramatic activities with children including improvisation and character development. .................338

Skill 45.3 Able to identify and explain styles of theatre from a variety of times, places, and cultures. .........................................................339

Skill 45.4 Able to make judgments about dramatic works based on the elements of theatre.................................................................340

SUBAREA IV. VISUAL ART

COMPETENCY 46.0 VISUAL ART ........................................................................341

Skill 46.1 Identify the components and strands of visual arts education found in the Visual and Performing Arts Framework and Student Academic Content Standards. .................................................................341

Skill 46.2 Demonstrate a basic fluency with the principles of art such as balance, repetition, contrast, emphasis, and unity and are able to explain how works of art are organized in terms of line, color, value, space, texture, shape, and form. ......................................................341
Skill 46.3  Able to identify and explain styles of visual arts from a variety of times, places, and cultures. ..............................................................342

Skill 46.4  Interpret works of art to derive meaning and are able to make judgments based on the principles of art as they are used to organize line, color, value, space, texture, shape, and form in works of art. ........................................................................................346

COMPETENCY 47.0 SKILLS AND ABILITIES......................................................347

Skill 47.1  Able to make informed judgments about the quality of works in the arts based on the elements, principles, and/or concepts of the art form. ............................................................................................347

Skill 47.2  Develop criteria for their judgments and justify their interpretations with plausible reasoning. ..........................................................347

Skill 47.3  Analyze the components and strands of the Visual and Performing Arts Framework and Student Academic Content Standards, and examine the connections among them. ..............................................347

Skill 47.4  Consider the origins, meaning, and significance of works in the visual and performing arts; raise questions that have been asked by people, past and present; and determine how their responses have varied in significant ways over the years ..................................348

Skill 47.5  Able to consider, weigh, and express ideas about aesthetic issues in the visual and performing arts. ......................................................349

CONTENT AREA—PHYSICAL EDUCATION

SUBAREA I. MOVEMENT SKILLS AND MOVEMENT KNOWLEDGE

COMPETENCY 48.0 BASIC MOVEMENT SKILLS ..............................................352

Skill 48.1  Identify movement concepts including body awareness, space awareness, and movement exploration. ..........................................................352

Skill 48.2  List locomotor skills such as skipping, nonlocomotor skills such as static balancing, and object manipulation such as catching. ...............353

Skill 48.3  Recognize basic concepts of biomechanics that affect movement, such as how the body moves and how such movement is influenced by gravity, friction, and the laws of motion. .........................354
Skill 48.4  Describe critical elements of basic movement skills, such as stepping in opposition when throwing and/or following through when kicking a ball. .................................................................359

COMPETENCY 49.0 EXERCISE PHYSIOLOGY: HEALTH AND PHYSICAL FITNESS ..........................................................361

Skill 49.1  Identify health and fitness benefits and associated risks, supporting a physically active lifestyle, related to safety and medical factors ....361

Skill 49.2  Recognize exercise principles such as frequency, intensity, and time to select activities that promote physical fitness. .........................361

Skill 49.3  Describe physical fitness components, such as flexibility, muscular strength and endurance, cardio-respiratory endurance, and body composition, which are included in comprehensive personal fitness development programs. .................................................................363

COMPETENCY 50.0 MOVEMENT FORMS: CONTENT AREAS .................................365

Skill 50.1  Know a variety of traditional and nontraditional games, sports, dance, and other physical activities. .....................................................365

Skill 50.2  Able to cite basic rules and social etiquette for physical activities. ...369

Skill 50.3  Selects activities for their potential to include all students regardless of gender, race, culture, religion, abilities, or disabilities. 373

Skill 50.4  Integrate activities with other content areas, such as math and science. ......................................................................................375

SUBAREA II. SELF-IMAGE AND PERSONAL DEVELOPMENT

COMPETENCY 51.0 PHYSICAL GROWTH AND DEVELOPMENT ..........................377

Skill 51.1  Identify the sequential development of fine and gross motor skills in children and young adolescents. .................................................................377

Skill 51.2  Describe the influence of growth spurts and body type on movement and coordination. .................................................................378

Skill 51.3  Recognize the impact of factors such as exercise, relaxation, nutrition, stress, and substance abuse on physical health and general well-being. ............................................................................379
COMPETENCY 52.0 SELF-IMAGE

Skill 52.1 Describe the role of physical activity in the development of a positive self-image, and how psychological skills such as goal setting are selected to promote lifelong participation in physical activity.

SUBAREA III. SOCIAL DEVELOPMENT

COMPETENCY 53.0 SOCIAL ASPECTS OF PHYSICAL EDUCATION

Skill 53.1 Recognize individual differences such as gender, race, culture, ability, or disability.

Skill 53.2 Describe the developmental appropriateness of cooperation, competition, and responsible social behavior for children of different ages.

Skill 53.3 List activities to provide opportunities for enjoyment, self-expression, and communication.

COMPETENCY 54.0 CULTURAL AND HISTORIC ASPECTS OF PHYSICAL MOVEMENT FORMS

Skill 54.1 Understand the significance of cultural and historical influences on games, sports, dance, and other physical activities.

COMPETENCY 55.0 SKILLS AND ABILITIES

Skill 55.1 Understand the key factors in the development, analysis, and assessment of basic motor skills.

Skill 55.2 Understand how to structure lessons to promote maximum participation, inclusion, and engagement in a variety of traditional and nontraditional games, sports, dance, and other physical activities.

Skill 55.3 Select lessons and activities based on factors such as the developmental levels of students and individual differences.

Skill 55.4 Design appropriate exercise programs and activities based on physical fitness concepts and applications that encourage physically active lifestyles.
Skill 55.5  Analyze the impact of factors such as exercise, relaxation, nutrition, stress, and substance abuse on physical health and well being, and can design activities to provide opportunities for enjoyment, self-expression, and communication. .................................................................398

Skill 55.6  Create cooperative and competitive movement activities that require personal and social responsibility. .................................................................399

Skill 55.7  Understand the significance of cultural and historical influences on games, sports, dance, and other physical activities........................................399

CONTENT AREA–HUMAN DEVELOPMENT

SUBAREA I.  COGNITIVE DEVELOPMENT FROM BIRTH THROUGH ADOLESCENCE

COMPETENCY 56.0 COGNITIVE DEVELOPMENT .........................................................400

Skill 56.1  Define basic concepts of cognitive and moral development .................400

Skill 56.2  Identify stages in cognitive and language development and use them to describe the development of individuals, including persons with special needs. .......................................................................................400

Skill 56.3  Identify characteristics of play and their influence on cognitive development. ..............................................................................................406

Skill 56.4  Recognize different perspectives on intelligence and their implications for identifying and describing individual differences in cognitive development. ...............................................................407

SUBAREA II.  SOCIAL AND PHYSICAL DEVELOPMENT FROM BIRTH THROUGH ADOLESCENCE

COMPETENCY 57.0 SOCIAL DEVELOPMENT .............................................................408

Skill 57.1  Define concepts related to the development of personality and temperament .....................................................................................................408

Skill 57.2  Describe the social development of children and young adolescents, including persons with special needs. ...........................................409

Skill 57.3  Identify characteristics of play and their impact on social development, and then describe influences on the development of pro-social behavior. ......................................................................................412
COMPETENCY 58.0 PHYSICAL DEVELOPMENT ..............................................413
Skill 58.1 Describe the scope of physical development at different ages. .......413
Skill 58.2 Identify individual differences in physical development, including the development of persons with special needs. .................................413

SUBAREA III.

SUBAREA III. INFLUENCE ON DEVELOPMENT FROM BIRTH THROUGH ADOLESCENCE

COMPETENCY 59.0 INFLUENCES ON DEVELOPMENT .................................415
Skill 59.1 Identify potential impacts on the development of children and young adolescents from genetic or organic causes, socio-cultural factors, socioeconomic factors, sex and gender. .........................................................415
Skill 59.2 Identify sources of possible abuse and neglect and describe their impact on development. ........................................................................416

COMPETENCY 60.0 SKILLS AND ABILITIES......................................................421
Skill 60.1 Apply knowledge of cognitive, social and physical development to understanding differences between individual children. ..................421
Skill 60.2 Interpret similarities and differences in children’s behavior with reference to concepts of human development.................................422
Skill 60.3 Use developmental concepts and principles to explain children’s behavior ............................................................................423

Sample Test........................................................................................................... 424
Answer Key ...........................................................................................................451
Answers with Rationales......................................................................................452
Sample Constructed Response Questions.........................................................478