
**NEW YORK STATE TEACHER
CERTIFICATION EXAMINATIONS™**

**FIELD 01: LIBERAL ARTS AND SCIENCES TEST (LAST)
TEST FRAMEWORK**

June 2003

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**New York State Teacher
Certification Examinations™**

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June 2003**

Subarea

	Selected-Response	Range of Objectives
I.	Scientific, Mathematical, and Technological Processes	0001–0006
II.	Historical and Social Scientific Awareness	0007–0011
III.	Artistic Expression and the Humanities	0012–0016
IV.	Communication and Research Skills	0017–0021
	Constructed-Response	
V.	Written Analysis and Expression	0022

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FIELD 01: LIBERAL ARTS AND SCIENCES TEST (LAST) TEST FRAMEWORK

Scientific, Mathematical, and Technological Processes
Historical and Social Scientific Awareness
Artistic Expression and the Humanities
Communication and Research Skills
Written Analysis and Expression

The New York State educator has the knowledge and skills necessary to teach effectively in New York State public schools. The teacher has a broad understanding of the fundamental concepts of mathematics, science, and technology and is familiar with the basic principles and procedures associated with scientific inquiry. The teacher recognizes the interrelatedness of geography and culture and can analyze varied interpretations of human history and society. The teacher has an understanding of the major traditions of art, literature, religion, and philosophy and how cultural contexts inform artistic and literary expression. The teacher can retrieve information from traditional and electronic sources, communicate effectively, reason clearly, and evaluate competing ideas and arguments. Most importantly, the teacher recognizes the fundamental connections among all realms of human thought and endeavor and the diverse perspectives that shape human societies.

SUBAREA I—SCIENTIFIC, MATHEMATICAL, AND TECHNOLOGICAL PROCESSES

0001 Use mathematical reasoning in problem-solving situations to arrive at logical conclusions and to analyze the problem-solving process.

For example:

- analyzing problem solutions for logical flaws
- examining problems to determine missing information needed to solve them
- analyzing a partial solution to a problem to determine an appropriate next step
- evaluating the validity or logic of an argument or advertising claim that is based on statistics or probability

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0002 Understand connections between mathematical representations and ideas; and use mathematical terms and representations to organize, interpret, and communicate information.

For example:

- analyzing data and making inferences from two or more graphic sources (e.g., diagrams, graphs, equations)
- restating a problem related to a concrete situation in mathematical terms
- using mathematical modeling/multiple representations to present, interpret, communicate, and connect mathematical information and relationships
- selecting an appropriate graph or table summarizing information presented in another form (e.g., a newspaper excerpt)

0003 Apply knowledge of numerical, geometric, and algebraic relationships in problem-solving and mathematical contexts.

For example:

- representing and using numbers in a variety of equivalent forms (e.g., integer, fraction, decimal, percent)
- applying operational algorithms to add, subtract, multiply and divide fractions, decimals, and integers
- using scales and ratios to interpret maps and models
- using geometric concepts and formulas to solve problems (e.g., estimating the surface area of a floor to determine the approximate cost of floor covering)
- solving problems using algebraic concepts and formulas (e.g., calculating wages based on sales commission)
- applying appropriate algebraic equations to the solution of problems (e.g., determining the original price of a sale item given the rate of discount)

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0004 Understand major concepts, principles, and theories in science and technology; and use that understanding to analyze phenomena in the natural world and to interpret information presented in illustrated or written form.

For example:

- using an appropriate illustration, graphic, or physical model to represent a scientific theory, concept, or relationship presented in an excerpt
- relating a major scientific principle, concept, or theory to a natural phenomenon
- using design processes and procedures to pose questions and select solutions to problems and situations
- applying technological knowledge and skills to evaluate the degree to which products and systems meet human and environmental needs
- analyzing excerpts describing recent scientific discoveries or technological advances in relation to underlying scientific principles, concepts, or themes

0005 Understand the historical development and cultural contexts of mathematics, science, and technology; the relationships and common themes that connect mathematics, science, and technology; and the impact of mathematics, science, and technology on human societies.

For example:

- analyzing the historical, societal, or environmental effects of given developments in science and technology (e.g., computerization)
- recognizing how mathematical models can be used to understand scientific, social, or environmental phenomena
- evaluating how historical and societal factors have promoted or hindered developments in science and technology
- analyzing how developments in scientific knowledge may affect other areas of life (e.g., recognizing types of scientific data likely to affect government policymaking regarding pollution control)

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0006 Understand and apply skills, principles, and procedures associated with inquiry and problem solving in the sciences.

For example:

- applying scientific methods and principles (including nonquantitative methods such as case studies) to investigate a question or problem
- formulating questions to guide research and experimentation toward explanations for phenomena and observations
- inferring the scientific principles (e.g., reliance on experimental data, replication of results) or skills (e.g., observation, inductive reasoning, familiarity with statistics and probability) that contributed to a scientific development as described in an excerpt
- demonstrating familiarity with electronic means for collecting, organizing, and analyzing information (e.g., databases, spreadsheets)
- analyzing the components of a given experimental design (e.g., dependent and independent variables, experimental groups, control groups)
- demonstrating an understanding of the nature of scientific inquiry (including ethical dimensions) and the role of observation and experimentation in science

SUBAREA II—HISTORICAL AND SOCIAL SCIENTIFIC AWARENESS

0007 Understand the interrelatedness of historical, geographic, cultural, economic, political, and social issues and factors.

For example:

- assessing the likely effects of human activities or trends (described in written or graphic form) on the local, regional, or global environment
- assessing ways in which major transformations related to human work, thought, and belief (e.g., industrialization, the scientific revolution, the development of various religions and belief traditions) have affected human society
- inferring aspects of a society's social structure or group interactions based on information presented in an excerpt
- analyzing ways in which social, cultural, geographic, and economic factors influence intergroup relations and the formation of values, beliefs, and attitudes
- assessing the social or economic implications of political views presented in an excerpt

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0008 Understand principles and assumptions underlying historical or contemporary arguments, interpretations, explanations, or developments.

For example:

- inferring the political principles (e.g., popular sovereignty, separation of powers, due process of the law) illustrated in given situations or arguments
- recognizing assumptions (e.g., regarding the nature of power relationships) that inform the positions taken by political parties
- analyzing assumptions on which given U.S. policies (e.g., national health insurance, foreign relations) are based
- recognizing concepts and ideas underlying alternative interpretations of past events
- inferring the economic principle (e.g., supply and demand, redistribution of wealth) upon which a given explanation is based

0009 Understand different perspectives and priorities underlying historical or contemporary arguments, interpretations, explanations, or developments.

For example:

- identifying the values (e.g., a commitment to democratic institutions) implicit in given political, economic, social, or religious points of view
- recognizing the motives, beliefs, and interests that inform differing political, economic, social, or religious points of view (e.g., arguments related to equity, equality, and comparisons between groups or nations)
- analyzing multiple perspectives within U.S. society regarding major historical and contemporary issues
- recognizing the values or priorities implicit in given public policy positions
- analyzing the perceptions or opinions of observers or participants from different cultures regarding a given world event or development

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0010 Understand and apply skills, principles, and procedures associated with inquiry, problem solving, and decision making in history and the social sciences.

For example:

- analyzing a description of research results to identify additional unanswered questions or to determine potential problems in research methodology
- determining the relevance or sufficiency of given information for supporting or refuting a point of view
- assessing the reliability of sources of information cited in historical or contemporary accounts or arguments and determining whether specific conclusions or generalizations are supported by verifiable evidence
- evaluating the appropriateness of specific sources (e.g., atlas, periodical guide, economic database) to meet given information needs (e.g., the distribution of natural resources in a given region, the political philosophy of a presidential candidate)
- distinguishing between unsupported and informed expressions of opinion

0011 Understand and interpret visual representations of historical and social scientific information.

For example:

- translating written or graphic information from one form to the other (e.g., selecting an appropriate graphic representation of information from an article on historical changes in global population)
- relating information provided in graphic representations (e.g., regarding population or economic trends) to public policy decisions
- interpreting historical or social scientific information provided in one or more graphs, charts, tables, diagrams, or maps
- inferring significant information (e.g., geographic, economic, sociological) about a historical or contemporary society based on examination of a photograph, painting, drawing, cartoon, or other visual representation

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SUBAREA III—ARTISTIC EXPRESSION AND THE HUMANITIES

0012 Understand and analyze elements of form and content in works from the visual and performing arts from different periods and cultures.

For example:

- recognizing important elements in a given work of the visual or performing arts (e.g., focal point, symmetry, repetition of shapes, perspective, motif, rhythm)
- determining how a sense of unity or balance is achieved in a given work from the visual or performing arts
- characterizing the theme, mood, or tone of a given work from the visual or performing arts
- determining how specific elements in a given work of the visual or performing arts (e.g., color, composition, scale, instrumentation, set design, choreography) affect audience perceptions of the content of the work

0013 Analyze and interpret works from the visual and performing arts representing different periods and cultures and understand the relationship of works of art to their social and historical contexts.

For example:

- identifying similarities and differences in forms and styles of art from different movements or periods of time
- comparing and contrasting two or more works from the visual or performing arts in terms of mood, theme, or technique
- demonstrating an understanding of art as a form of communication (e.g., conveying political or moral concepts, serving as a means of individual expression)
- analyzing ways in which the content of a given work from the visual or performing arts reflects a specific cultural or historical context

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0014 Understand forms and themes used in literature from different periods and cultures.

For example:

- identifying characteristic features of various genres of fiction and nonfiction (e.g., novels, plays, essays, autobiographies)
- distinguishing the dominant theme in a literary passage
- recognizing common literary elements and techniques (e.g., imagery, metaphor, symbolism, allegory, foreshadowing, irony) and using those elements to interpret a literary passage
- determining the meaning of figurative language used in a literary passage

0015 Analyze and interpret literature from different periods and cultures and understand the relationship of works of literature to their social and historical contexts.

For example:

- analyzing how the parts of a literary passage contribute to the whole
- comparing and contrasting the tone or mood of two or more literary passages
- analyzing aspects of cultural or historical context implied in a literary passage
- distinguishing characteristic features of different literary genres, periods, and traditions reflected in one or more literary passages
- making inferences about character, setting, author's point of view, etc., based on the content of a literary passage
- recognizing how a text conveys multiple levels of meaning

0016 Analyze and interpret examples of religious or philosophical ideas from various periods of time and understand their significance in shaping societies and cultures.

For example:

- distinguishing the religious and philosophical traditions associated with given cultures and world regions
- recognizing assumptions and beliefs underlying ideas presented in religious or philosophical writing
- analyzing societal implications of philosophical or religious ideas
- comparing and contrasting key concepts presented in two excerpts reflecting different philosophical or religious traditions

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SUBAREA IV—COMMUNICATION AND RESEARCH SKILLS

0017 Derive information from a variety of sources (e.g., magazine articles, essays, Web sites).

For example:

- identifying the stated or implied main idea of a paragraph or passage
- selecting an accurate summary or outline of a passage
- organizing information presented on a Web site or other electronic means of communication
- comprehending stated or implied relationships in an excerpt (e.g., cause-and-effect, sequence of events)
- recognizing information that supports, illustrates, or elaborates the main idea of a passage

0018 Analyze and interpret written materials from a variety of sources.

For example:

- recognizing a writer's purpose for writing (e.g., to persuade, to describe)
- drawing conclusions or making generalizations based on information presented in an excerpt
- interpreting figurative language in an excerpt
- comparing and contrasting views or arguments presented in two or more excerpts

0019 Use critical-reasoning skills to assess an author's treatment of content in written materials from a variety of sources.

For example:

- analyzing the logical structure of an argument in an excerpt and identifying possible instances of faulty reasoning
- distinguishing between fact and opinion in written material
- determining the relevance of specific facts, examples, or data to a writer's argument
- interpreting the content, word choice, and phrasing of a passage to determine a writer's opinions, point of view, or position on an issue
- evaluating the credibility, objectivity, or bias of an author's argument or sources

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0020 Analyze and evaluate the effectiveness of expression in a written paragraph or passage according to the conventions of edited American English.

For example:

- revising text to correct problems relating to grammar (e.g., syntax, pronoun-antecedent agreement)
- revising text to correct problems relating to sentence construction (e.g., those involving parallel structure, misplaced modifiers, run-on sentences)
- revising text to improve unity and coherence (e.g., eliminating unnecessary sentences or paragraphs, adding a topic sentence or introductory paragraph, clarifying transitions between and relationships among ideas presented)
- analyzing problems related to the organization of a given text (e.g., logical flow of ideas, grouping of related ideas, development of main points)

0021 Demonstrate the ability to locate, retrieve, organize, and interpret information from a variety of traditional and electronic sources.

For example:

- demonstrating familiarity with basic reference tools (e.g., encyclopedias, almanacs, bibliographies, databases, atlases, periodical guides)
- recognizing the difference between primary and secondary sources
- formulating research questions and hypotheses
- applying procedures for retrieving information from traditional and technological sources (e.g., newspapers, CD-ROMs, the Internet)
- interpreting data presented in visual, graphic, tabular, and quantitative forms (e.g., recognizing level of statistical significance)
- organizing information into logical and coherent outlines
- evaluating the reliability of different sources of information

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SUBAREA V—WRITTEN ANALYSIS AND EXPRESSION

0022 Prepare an organized, developed composition in edited American English in response to instructions regarding audience, purpose, and content.

For example:

- taking a position on an issue of contemporary concern and defending that position with reasoned arguments and supporting examples
- analyzing and responding to an opinion presented in an excerpt
- comparing and contrasting conflicting viewpoints on a social, political, or educational topic, as presented in one or more excerpts
- evaluating information and proposing a solution to a stated problem
- synthesizing information presented in two or more excerpts