



**Missouri General Education Assessment
(Effective September 2013 through August 2015)**

Technical Manual Appendix

June 2015

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Prepared for:
Missouri Department of Elementary and Secondary Education

Developed and Produced by

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TABLE OF CONTENTS

Framework	Appendix A
Standard Setting Conference Survey	Appendix B
Standard Setting Conference Survey Results	Appendix C
Test Form Statistics Report	Appendix D
Writing Subtest Scorer Reliability	Appendix E
Total Scaled Score Distribution by Subtest	Appendix F

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Appendix A: Framework

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Missouri Educator Gateway Assessments

FIELDS 001–005: GENERAL EDUCATION ASSESSMENT TEST FRAMEWORK

August 2013

001: English Language Arts

Competency	Approximate Percentage of Test Score
0001 Comprehension and Analysis of Text	25%
0002 Informational and Persuasive Text	25%
0003 Literary Text	25%
0004 Oral Communication and Public Speaking	25%

002: Writing

Competency	Approximate Percentage of Test Score
0005 Writing Assignment	100%

003: Mathematics

Competency	Approximate Percentage of Test Score
0006 Numbers and Algebra	50%
0007 Measurement and Geometry	25%
0008 Probability and Statistics	25%

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004: Science

Competency	Approximate Percentage of Test Score
0009 The Nature and Practice of Science	38%
0010 Biology and Chemistry	31%
0011 Physics, Geology, and Astronomy	31%

005: Social Studies

Competency	Approximate Percentage of Test Score
0012 Inquiry and Literacy Skills	38%
0013 History, Geography, Culture, and Society	31%
0014 Government, Civics, and Economics	31%

Missouri Educator Gateway Assessments
TEST FRAMEWORK
FIELDS 001–005: GENERAL EDUCATION ASSESSMENT

ENGLISH LANGUAGE ARTS

0001 Demonstrate the ability to comprehend, interpret, and analyze text from a variety of styles and genres.

For example:

- Analyze the development of central ideas or themes over the course of a text and evaluate concepts, ideas, and details that support, illustrate, or elaborate the central ideas or themes of a text.
- Apply knowledge of word structure, context, and syntax to determine the meanings of words and phrases in a text.
- Demonstrate understanding of figurative language, connotative meanings, and the effect of specific word choices on meaning and tone of a text.
- Assess how the author develops a point of view or purpose in a text through choices of style and content.
- Analyze how specific sentences, paragraphs, and larger portions of text relate to each other and to the whole.
- Draw conclusions or make inferences from stated or implied information in a text.

0002 Demonstrate the ability to use critical reasoning skills to evaluate an informational or persuasive text.

For example:

- Analyze the arguments or claims made in a text and the type of appeal (e.g., emotional, ethical, logical) an author uses.
- Evaluate the validity of the author's reasoning and inferences and assess the relevance and sufficiency of supporting evidence, illustrations, or analogies in a text.
- Recognize the assumptions on which a writer's argument is based and evaluate the credibility and accuracy of information presented in a text.
- Analyze how two or more texts address similar themes or topics.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

0003 Demonstrate the ability to use critical reasoning skills to evaluate literary text from a variety of cultures and time periods.

For example:

- Recognize the important characteristics and central themes of foundational works of American and world literature.
- Recognize important features and distinguishing motifs of major literary movements and periods.
- Interpret and compare works of literature from a variety of genres (e.g., fiction, drama, poetry) and/or a range of periods and cultures in terms of form, subject, theme, mood, or technique.
- Analyze how literary devices and techniques (e.g., personification, metaphor, irony, foreshadowing) are used in a work of fiction, drama, or poetry to develop a point of view, establish a tone, convey a theme, or create a mood.
- Analyze ways in which the content of a given work of literature reflects or is influenced by a specific social or historical context.

0004 Demonstrate understanding of effective oral communication and public speaking skills.

For example:

- Demonstrate knowledge of how to identify, use, and create speeches for different types of speaking purposes (e.g., informing, persuading, entertaining, motivating) and the basic process of audience analysis.
- Demonstrate knowledge of how to organize (e.g., introduction, body, conclusion) and structure speeches (e.g., chronological order, cause and effect, climax order, anticlimax order, spatial order), using effective transitions and rhetorical devices.
- Demonstrate knowledge of how to develop and support arguments with appropriate support that is unified, coherent, and fully developed.
- Demonstrate knowledge of the components of good delivery (e.g., verbal skills, nonverbal components, articulation, speaking persona, self-reflection).
- Demonstrate knowledge of effective listening and analysis skills as they relate to critical evaluation of speech topics and the ability to critique oral presentations (e.g., evaluating a speaker's point of view, reasoning, and use of evidence and rhetoric; assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone).
- Demonstrate knowledge of communication ethics and the role of public speaking in a democratic society.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

WRITING

0005 Produce a clear and coherent written composition in which the development, organization, and style are appropriate to task, purpose, and audience.

For example:

- Demonstrate the ability to support claims in writing using valid reasoning and relevant and sufficient evidence, with an appropriate use of generalizations and adequate, specific, and illustrative details.
- Demonstrate the ability to produce focused, coherent, and unified writing, employing a variety of rhetorical strategies in which the development, organization, and style are appropriate to task, purpose, and audience.
- Demonstrate the ability to use effectively words, phrases, clauses, transitional devices, and syntax to link sections of the text, create cohesion, and clarify relationships among ideas.
- Demonstrate the ability to introduce and develop ideas through the effective use of thesis statements and/or topic sentences and to provide an effective conclusion that follows from the ideas presented in the composition.
- Demonstrate command of a variety of sentence structures and the conventions of Standard English grammar and usage.
- Demonstrate command of the conventions of English capitalization, punctuation, and spelling.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

MATHEMATICS

0006 Understand numbers and algebra.

For example:

- Apply operations using different representations of rational numbers to model and solve a variety of mathematical and real-world problems.
- Identify equivalent numerical and algebraic expressions, including expressions with radicals and with rational exponents.
- Justify steps in an algebraic solution by applying the properties of numbers and their operations.
- Rewrite equations that solve a formula for a given variable.
- Represent and solve mathematical and real-world problems using numeric and algebraic expressions (e.g., arithmetic and geometric sequences, ratios and proportional thinking).
- Model and solve mathematical and real-world problems using linear equations and inequalities and their graphs.
- Model and solve mathematical and real-world problems using simultaneous pairs of linear equations.

0007 Understand measurement and geometry.

For example:

- Solve mathematical and real-world problems involving angle measure, perimeter, circumference, area, surface area, and volume of basic two- and three-dimensional figures.
- Apply geometric concepts (e.g., similarity, congruence, the Pythagorean theorem) to solve mathematical and real-world problems.
- Solve problems involving right triangles.
- Analyze formal and informal geometric proofs.
- Apply techniques of coordinate geometry to analyze characteristics of basic geometric figures and solve problems.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

0008 Understand probability and statistics.

For example:

- Apply knowledge of the rules of probability and counting to compute probabilities and solve problems in a variety of situations.
- Find probabilities of compound events using organized lists, tables, tree diagrams, and simulations.
- Demonstrate knowledge of the use of sampling to draw inferences about a population.
- Demonstrate knowledge of the use of measures of central tendency and spread to summarize and describe data distributions.
- Analyze information presented in a variety of formats (e.g., box plots, histograms, circle graphs).

FIELDS 001–005: GENERAL EDUCATION ASSESSMENT TEST FRAMEWORK

SCIENCE

0009 Understand the nature and practice of science.

For example:

- Demonstrate knowledge of the principles and methods of scientific inquiry, including the formulation of testable hypotheses, the design and conduct of valid investigations, and the selection and use of appropriate tools and procedures.
- Demonstrate knowledge of measurement principles and methods; and procedures for gathering, analyzing, and presenting scientific information and numeric data from laboratory and field investigations, including the use of mathematical analysis.
- Analyze scientific and technical texts, including summarizing complex information presented in multiple formats, explaining central ideas and hypotheses, and citing and evaluating evidence used to support conclusions.
- Analyze an author's purpose in providing specific information in a scientific or technical text and recognize how scientific and technical texts structure information into categories and hierarchies.
- Demonstrate knowledge of mathematical and physical models used to represent scientific relationships and interpret the symbols and domain-specific terminology used in undergraduate-level scientific and technical texts.
- Demonstrate knowledge of how science is conducted and how scientific explanations and theories are developed over time; the difference between scientific theories and laws; and the relationships between science, technology, and society, including the social, personal, and cultural contexts of science.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

0010 Understand the fundamental concepts, principles, and theories of biology and chemistry.

For example:

- Demonstrate knowledge of the structure and function of biomolecules, the characteristics of cells from various types of organisms, and physiological processes, including cellular respiration and photosynthesis.
- Demonstrate knowledge of the characteristics of major groups of organisms and the ways that plants and animals obtain, store, and use energy and nutrients.
- Demonstrate knowledge of the basic principles of genetics, including common applications of biotechnology; the patterns and processes of inheritance; and the theory of evolution, including the tools and evidence used to determine relationships among organisms.
- Recognize the characteristics of ecosystems and biomes, the flow of energy and cycling of matter in ecosystems, and the effect of human activities on the environment and biological systems.
- Demonstrate knowledge of the properties and characteristics of matter, of atomic structure, of the periodic table, and of physical and chemical changes.
- Demonstrate knowledge of the different states of matter, the characteristics of phase changes, and the gas laws.
- Recognize the characteristics of various types of chemical bonds and intermolecular forces and their effects on the properties of substances, common types of chemical reactions, and the concept of chemical equilibrium.
- Demonstrate knowledge of the conservation of mass and energy and the properties of solutions, including ways of expressing concentration and converting between units; and the ability to perform chemical calculations and balance basic chemical equations.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

0011 Understand the fundamental concepts, principles, and theories of physics, geology, and astronomy.

For example:

- Demonstrate knowledge of types of forces, including gravity; the relationship between velocity, acceleration, and force; and the application of Newton's laws to describe motion.
- Recognize the characteristics and transformations of various forms of energy and the relationship between energy, heat, and temperature.
- Demonstrate knowledge of mechanical and electromagnetic waves, the characteristics of sound and light, and general concepts related to electricity and magnetism.
- Demonstrate knowledge of the earth's geologic, atmospheric, and hydrospheric systems; the earth's surface features; and the properties and characteristics of the earth's materials, including rocks, soil, water, and energy and mineral resources.
- Demonstrate knowledge of the earth's history, concepts and principles used in studying the earth's history, the changes that have occurred over geologic time, and the geologic processes that shape the earth's surface.
- Demonstrate knowledge of the hierarchical structure of the universe; the nature of the solar system and the universe; the basic motions of bodies in space; and interactions of the sun, moon, and Earth and the effects of these interactions on Earth systems.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

SOCIAL STUDIES

0012 Apply inquiry and literacy skills in the social sciences.

For example:

- Identify the characteristics of social science disciplines, demonstrate knowledge of social studies tools and resources, recognize basic steps and procedures (e.g., posing questions, formulating hypotheses, challenging claims) in social science research, and apply skills for locating, gathering, organizing, and presenting social science information.
- Identify and interpret primary and secondary sources, placing them in the context of their time and place; and demonstrate the ability to formulate historical arguments based on evidence from such sources.
- Demonstrate the ability to identify purpose, point of view, central ideas, and relationships between fundamental concepts and key details in social science documents.
- Demonstrate the ability to interpret words and phrases used in social science texts, identify underlying assumptions, distinguish between fact and opinion, recognize bias, and assess the adequacy of claims, reasoning, and evidence in social science documents.
- Demonstrate the ability to integrate and evaluate content presented in diverse formats and media and analyze how multiple texts address similar themes or topics.
- Evaluate multiple perspectives and interpretations of world and U.S. history; examine the assumptions, values, and beliefs on which they are based; and analyze historical and contemporary problems in the social sciences.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

0013 Understand major developments and significant features of world and U.S. history, geography, culture, and society.

For example:

- Recognize the chief characteristics, connections, commonalities, differences, and contributions of world civilizations.
- Analyze the origins and consequences of significant eras, events, and movements in world and U.S. history; recognize the roles of notable individuals; and demonstrate knowledge of the chronological and causal relationships between the social, political, scientific, technological, economic, and cultural developments that have shaped human history.
- Use historical analysis to evaluate cause and effect, comparisons and contrasts, and patterns of continuity over time.
- Demonstrate knowledge of major concepts in geography, anthropology, and sociology (e.g., region, relative location, cultural diffusion, status) and use geographic tools (e.g., maps, atlases) to analyze and interpret information.
- Identify the location and characteristics of major physical features, climatic patterns, cultural regions, and political units of the world and analyze their geographic significance.
- Demonstrate knowledge of factors that influence human migration and settlement, apply understanding of fundamental population models and terminology, and analyze historical and contemporary patterns of population growth, decline, and movement.
- Demonstrate knowledge of the characteristics of cultural groups; recognize the economic, political, and cultural commonalities, differences, and interactions between places and regions; and analyze the ways in which humans modify the physical and social environments and are influenced by the physical and social environments around them.
- Demonstrate knowledge of how personal identity is formed and shaped and the role of culture and social institutions in human societies.

**FIELDS 001–005: GENERAL EDUCATION ASSESSMENT
TEST FRAMEWORK**

0014 Understand primary features, central concepts, and basic operations of the world's political and economic systems and the principles of American citizenship.

For example:

- Recognize major characteristics of various forms of government and examine similarities and differences between political systems.
- Demonstrate knowledge of the origins, basic structures, functions, and purposes of government in the United States and Missouri, and analyze the democratic ideals and constitutional principles (e.g., federalism, popular sovereignty, separation of powers) on which they are based.
- Demonstrate knowledge of the U.S. electoral system (e.g., political parties, electoral campaigns, public opinion, the media), the rights and responsibilities of U.S. citizenship, and the skills and civic dispositions required for effective participation in politics and government.
- Recognize basic characteristics of a free-market economic system and examine similarities and differences among major economic systems.
- Demonstrate knowledge of the components and operation of the U.S. economy, including the role of government and the application of fiscal and monetary policy.
- Demonstrate knowledge of basic principles of international trade and historical and contemporary patterns of commercial exchange in the global economic system.

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Appendix B: Standard Setting Conference Survey

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Standard Setting Conference August 1/September 19, 2013

The purpose of this evaluation is to obtain your feedback on the various components of the Standard Setting Conference.

Field Name: _____

Please record your responses on the Scannable Rating Form.

Additional comments may be made in the space at the bottom of this form. Use pencil only. Please do not sign the Rating Form so that your responses will be anonymous. Thank you for your participation in the Standard Setting Conference.

1. How well do you feel you understood the training that you received for making your standard setting judgments?

1	2	3	4	5
Not At All Well				Very Well

2. How confident are you of the standard setting judgments you made?

1	2	3	4	5
Not At All Confident				Very Confident

3. How satisfied are you that you were able to complete the work you were asked to do in the time that was provided?

1	2	3	4	5
Not At All Satisfied				Very Satisfied

4. How successful were the coordination and logistics of the standard setting conference?

1	2	3	4	5
Not At All Successful				Very Successful

5. Overall, how satisfied are you with the standard setting process in which you participated?

1	2	3	4	5
Not At All Satisfied				Very Satisfied

Please provide any additional comments about the standard setting activities below and on the reverse side, as necessary.

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Appendix C: Standard Setting Conference Survey Results

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Appendix D: Test Form Statistics Report

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**Missouri Educator Gateway Assessments (MEGA)
September 1, 2013 - August 31, 2014
Technical Report Statistics by Test Form**

		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Open Response Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
001 English Language Arts	A	3,040	230	14.8	0.73	--	32	0.62	--
	B	217	225	14.5	0.66	--	32	0.57	--
	C	218	228	14.7	0.72	--	32	0.63	--
002 Writing	A	3,404	225	13.1	0.87	--	--	--	0.81
003 Mathematics	A	3,368	198	15.9	0.90	--	32	0.78	--
	B	325	189	16.0	0.93	--	32	0.70	--
	C	323	186	15.8	0.94	--	32	0.75	--
004 Science	A	3,088	221	15.1	0.78	--	32	0.75	--
	B	226	216	15.0	0.74	--	32	0.72	--
	C	227	217	15.1	0.74	--	32	0.70	--
005 Social Studies	A	3,152	216	15.6	0.80	--	32	0.75	--
	B	241	215	15.6	0.77	--	32	0.71	--
	C	241	211	15.6	0.82	--	32	0.72	--

Missouri Educator Gateway Assessments (MEGA)
September 1, 2014 - April 12, 2015
Technical Report Statistics by Test Form

		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Open Response Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
001 English Language Arts	A	1,568	228	14.5	0.69	--	32	0.57	--
	B	1,569	231	14.5	0.72	--	32	0.61	--
002 Writing	A	3,028	224	12.5	0.88	--	--	--	0.83
003 Mathematics	A	1,967	195	15.8	0.90	--	32	0.77	--
	B	1,969	198	15.9	0.89	--	32	0.78	--
004 Science	A	1,623	221	15.1	0.77	--	32	0.73	--
	B	1,624	224	14.9	0.78	--	32	0.73	--
005 Social Studies	A	1,656	217	15.5	0.80	--	32	0.74	--
	B	1,658	216	15.5	0.79	--	32	0.73	--

Appendix E: Writing Subtest Scorer Reliability

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**Missouri Educator Gateway Assessments (MEGA)
September 1, 2013 - August 31, 2014
Technical Report Statistics by Test Field (All Forms)**

	Number of Tests Taken	OpenResponse Prompts			
		Item 1 of 1			
		Scorer Agreement			Inter-rater Reliability
		Percent Agreement	Percent Exact	Percent Adjacent	
002 Writing	3,404	99.8	76.0	23.7	0.80

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**Missouri Educator Gateway Assessments (MEGA)
September 1, 2014 - April 12, 2015
Technical Report Statistics by Test Field (All Forms)**

	Number of Tests Taken	Open Response Prompts							
		Item 1 of 2				Item 2 of 2			
		Scorer Agreement			Inter-rater Reliability	Scorer Agreement			Inter-rater Reliability
Percent Agreement	Percent Exact	Percent Adjacent	Percent Agreement	Percent Exact		Percent Adjacent			
002 Writing	3,028	99.8	78.1	21.7	0.82	--	--	--	--

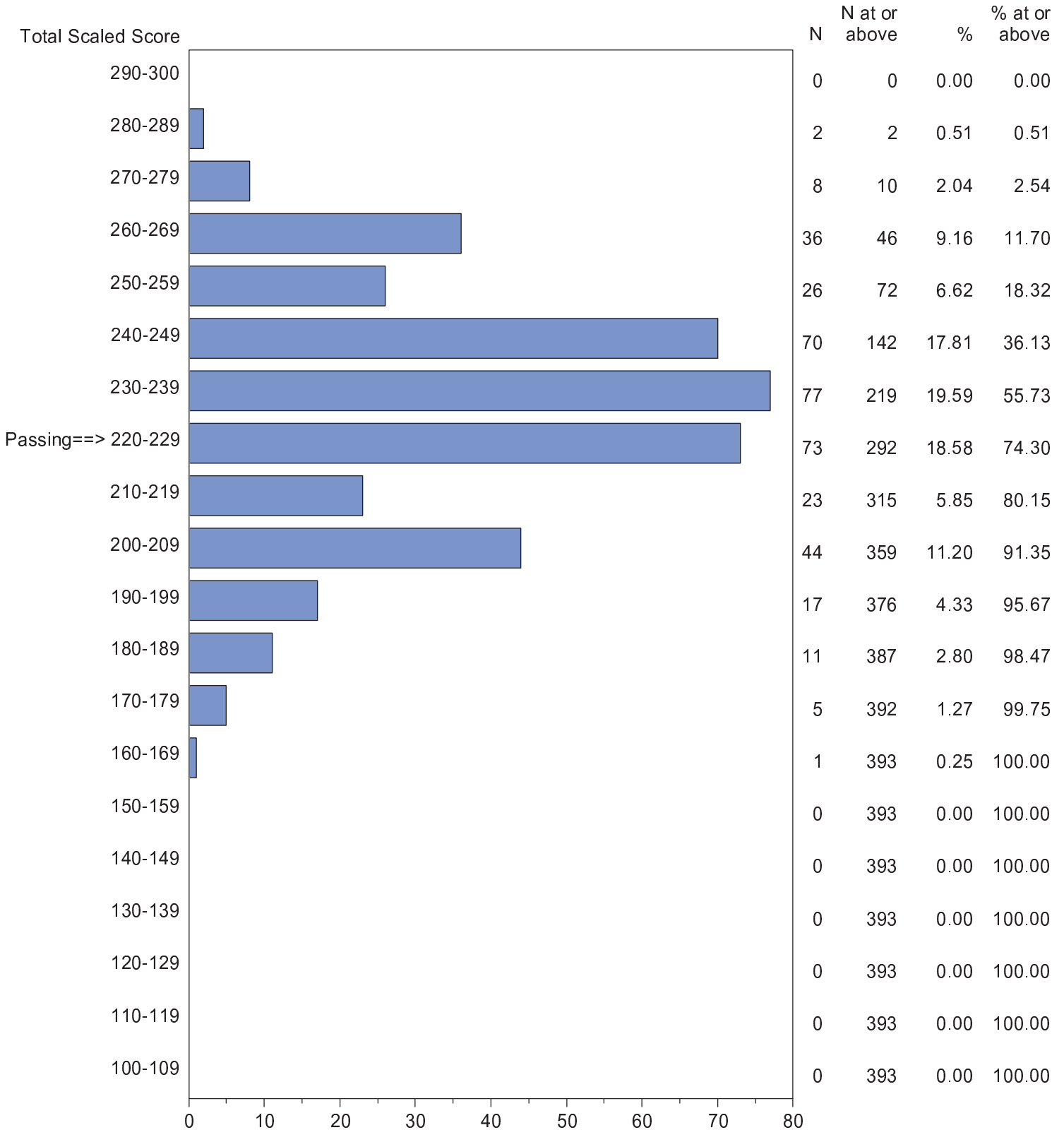
Appendix F: Total Scaled Score Distribution by Subtest

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Missouri Educator Gateway Assessments (MEGA)
 September 1, 2013 - August 31, 2014
 Total Scaled Score Distribution by Test Field (All Forms)

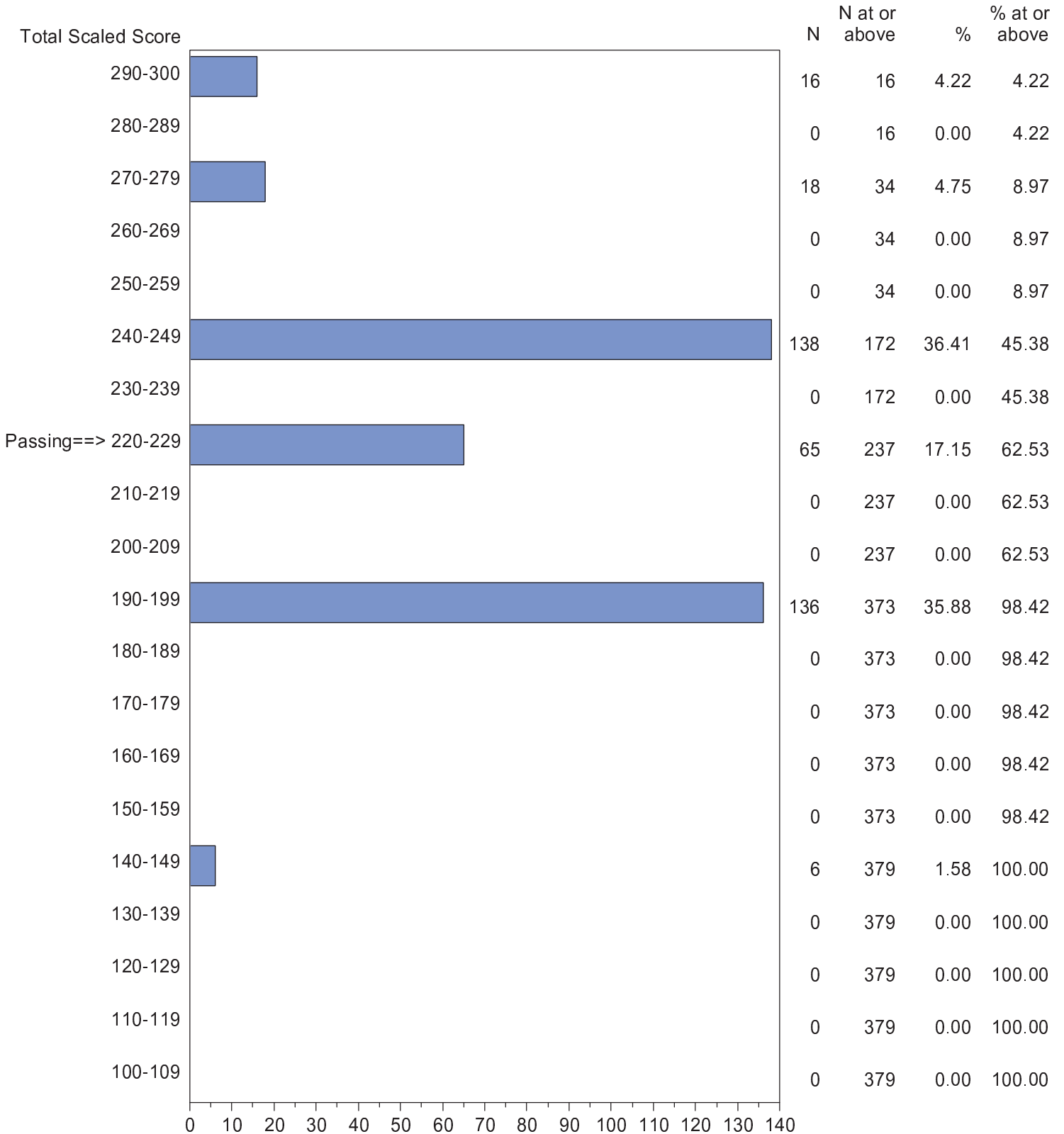
Test Field=001 English Language Arts



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Missouri Educator Gateway Assessments (MEGA)
 September 1, 2013 - August 31, 2014
 Total Scaled Score Distribution by Test Field (All Forms)

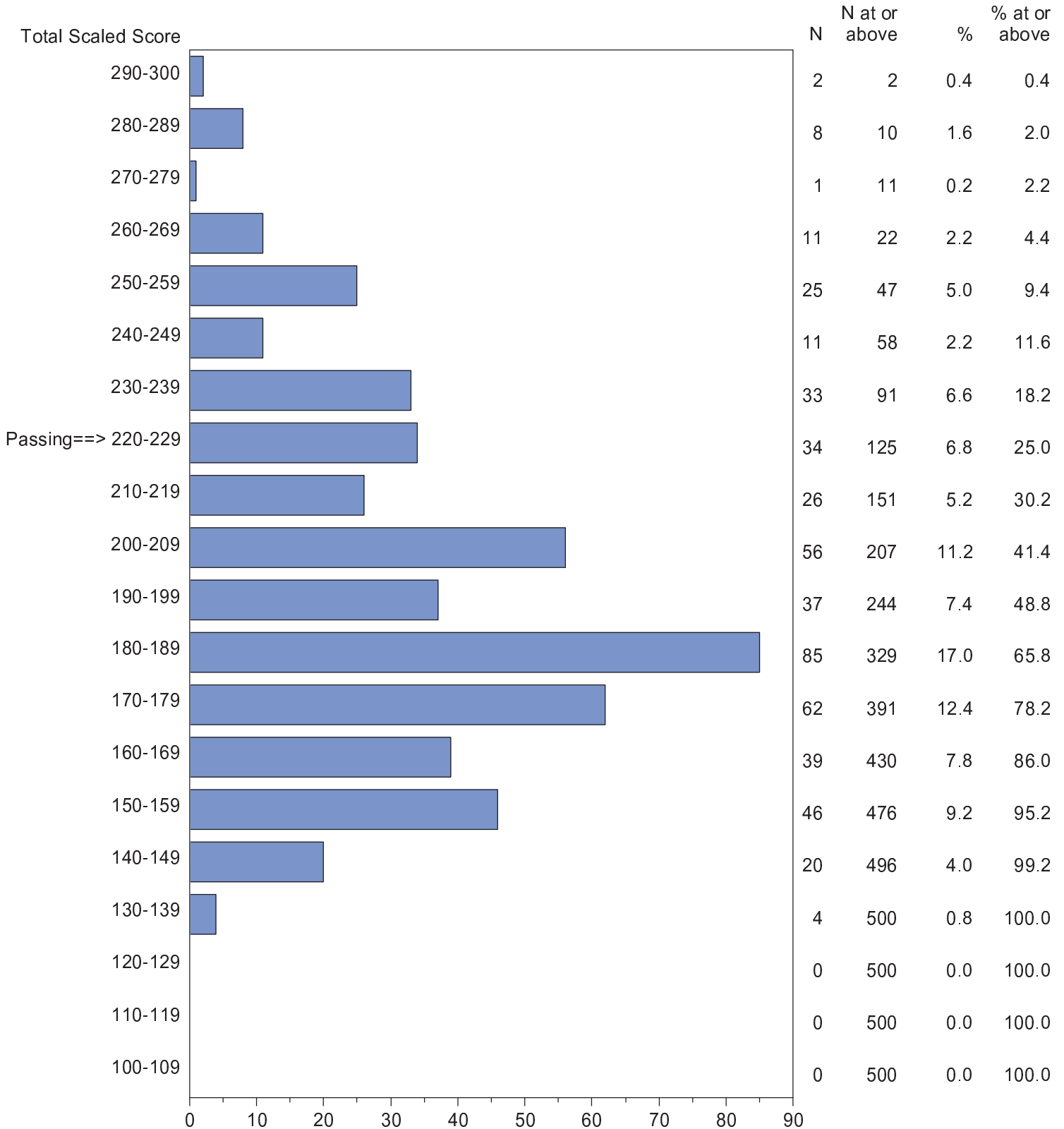
Test Field=002 Writing



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Missouri Educator Gateway Assessments (MEGA)
 September 1, 2013 - August 31, 2014
 Total Scaled Score Distribution by Test Field (All Forms)

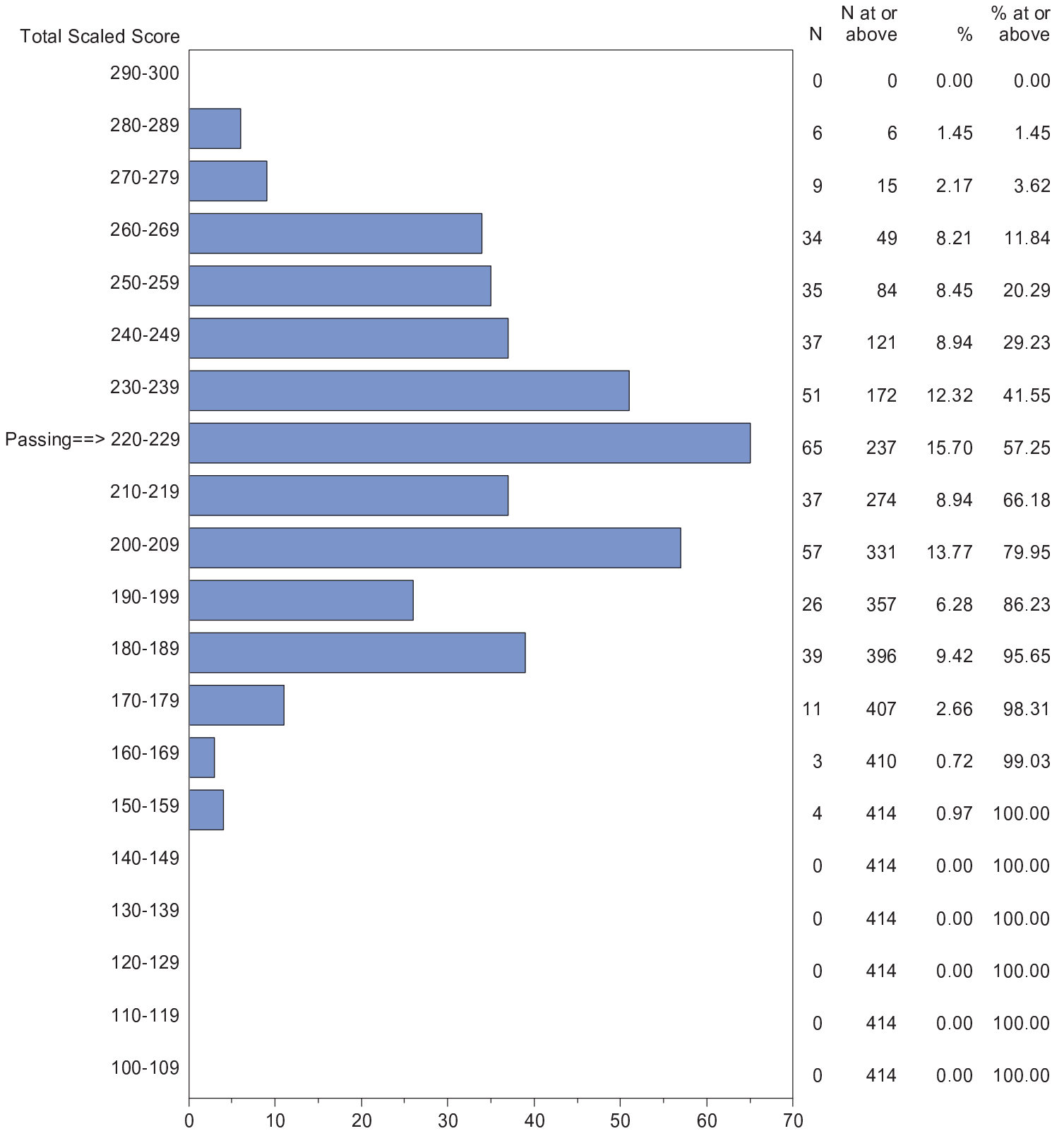
Test Field=003 Mathematics



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 Total Scaled Score Distribution by Test Field (All Forms)

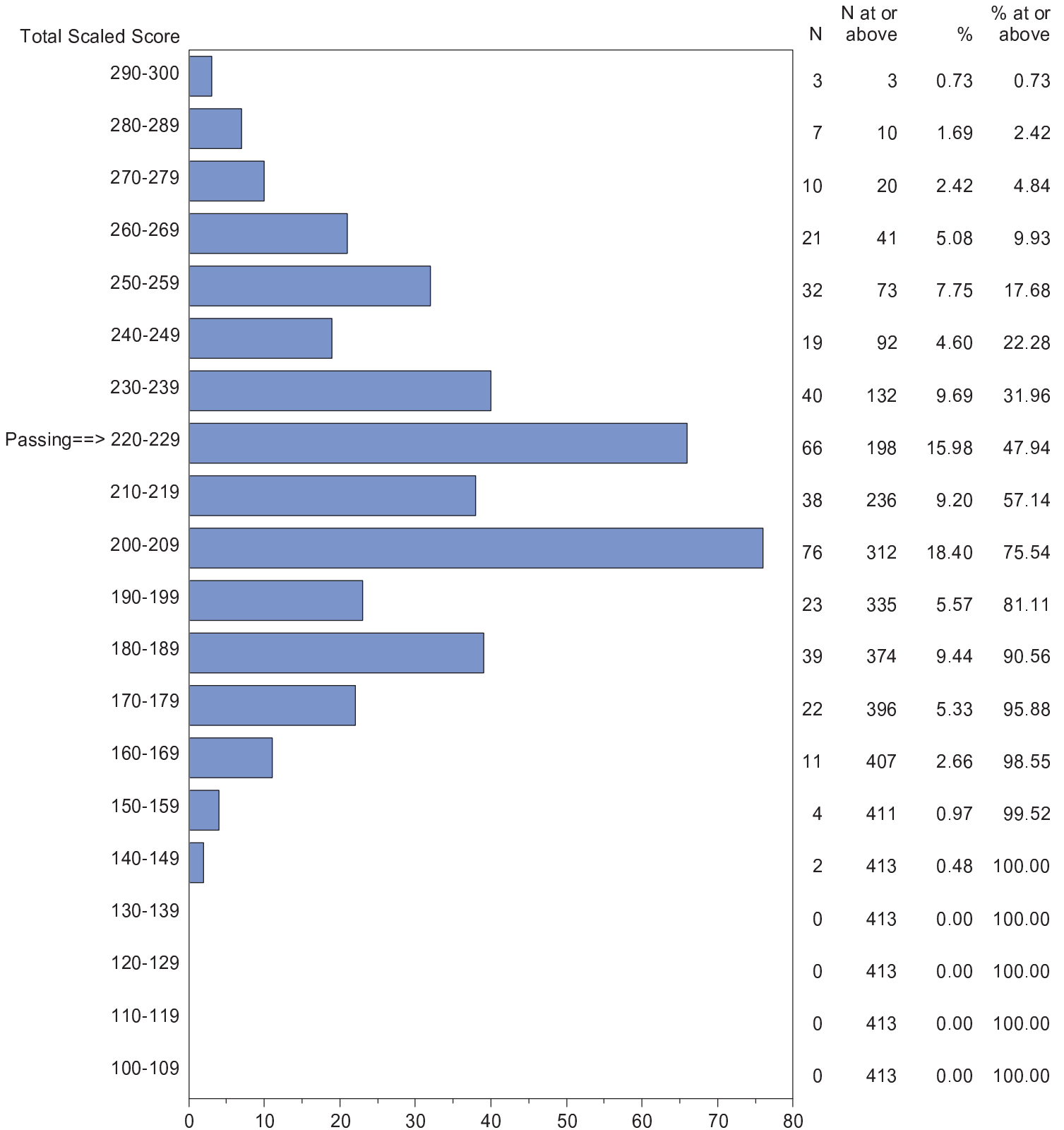
Test Field=004 Science



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Missouri Educator Gateway Assessments (MEGA)
 September 1, 2013 - August 31, 2014
 Total Scaled Score Distribution by Test Field (All Forms)

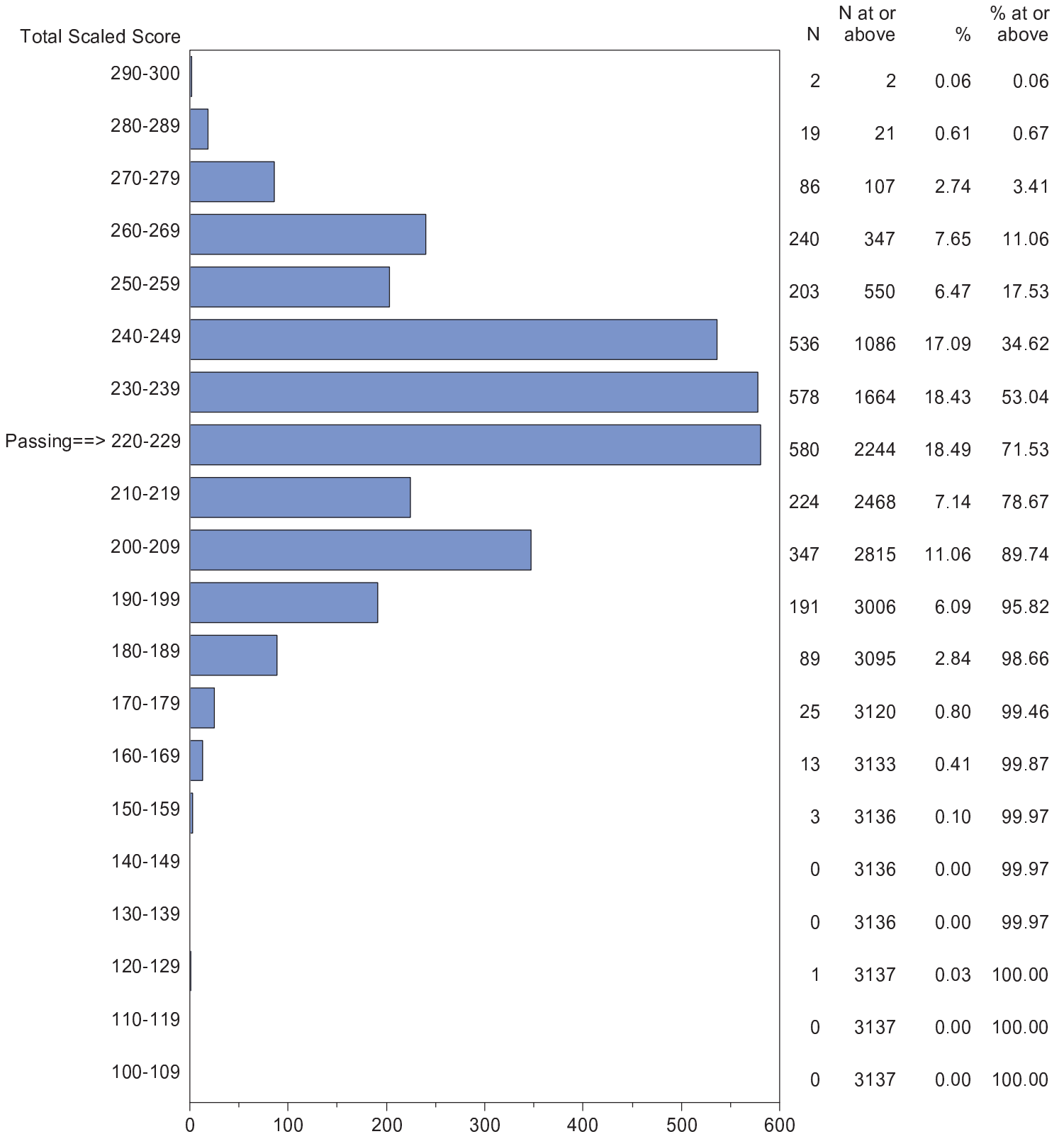
Test Field=005 Social Studies



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Missouri Educator Gateway Assessments (MEGA)
 September 1, 2014 - April 12, 2015
 Total Scaled Score Distribution by Test Field (All Forms)

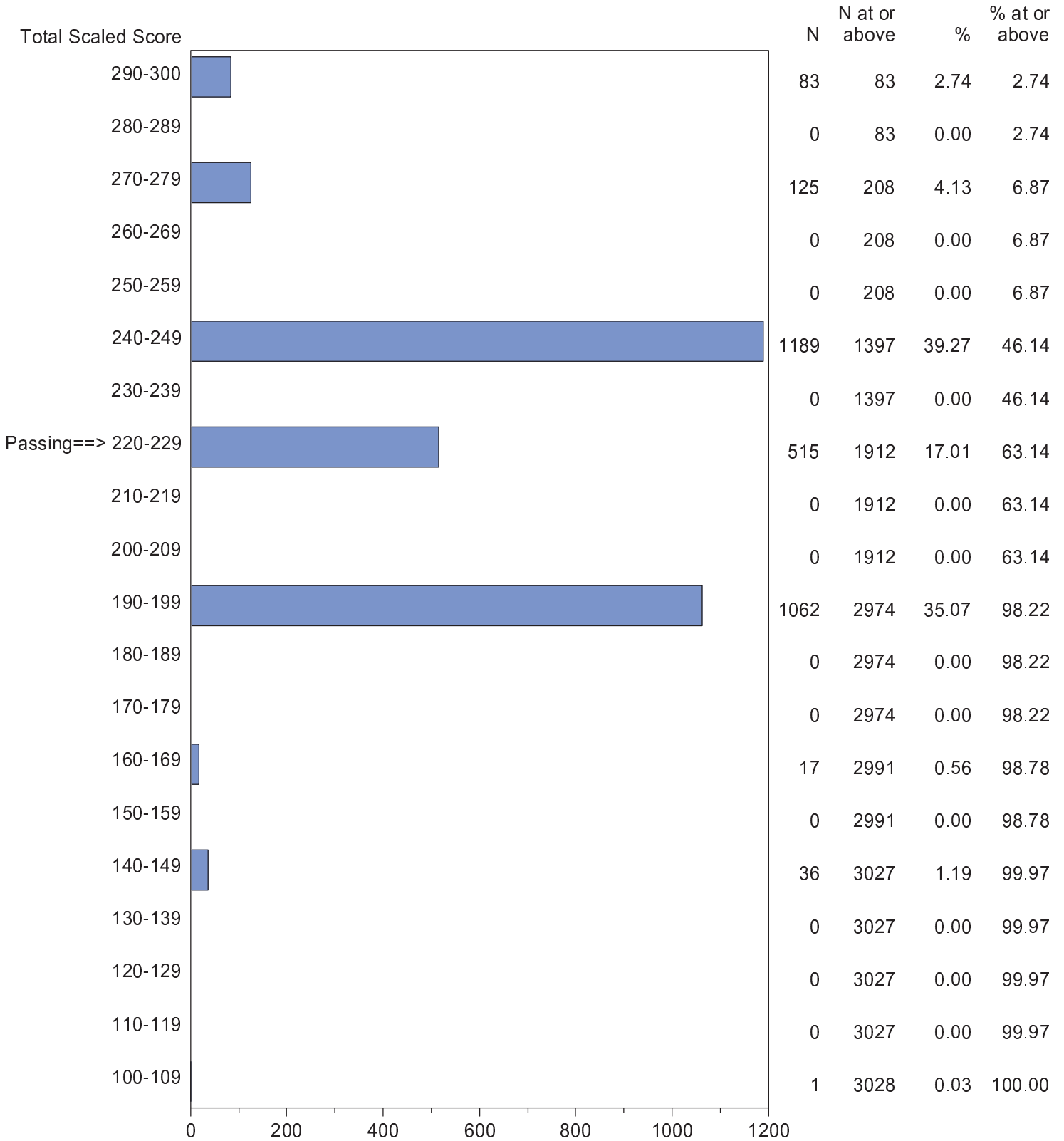
Test Field=001 English Language Arts



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 Total Scaled Score Distribution by Test Field (All Forms)

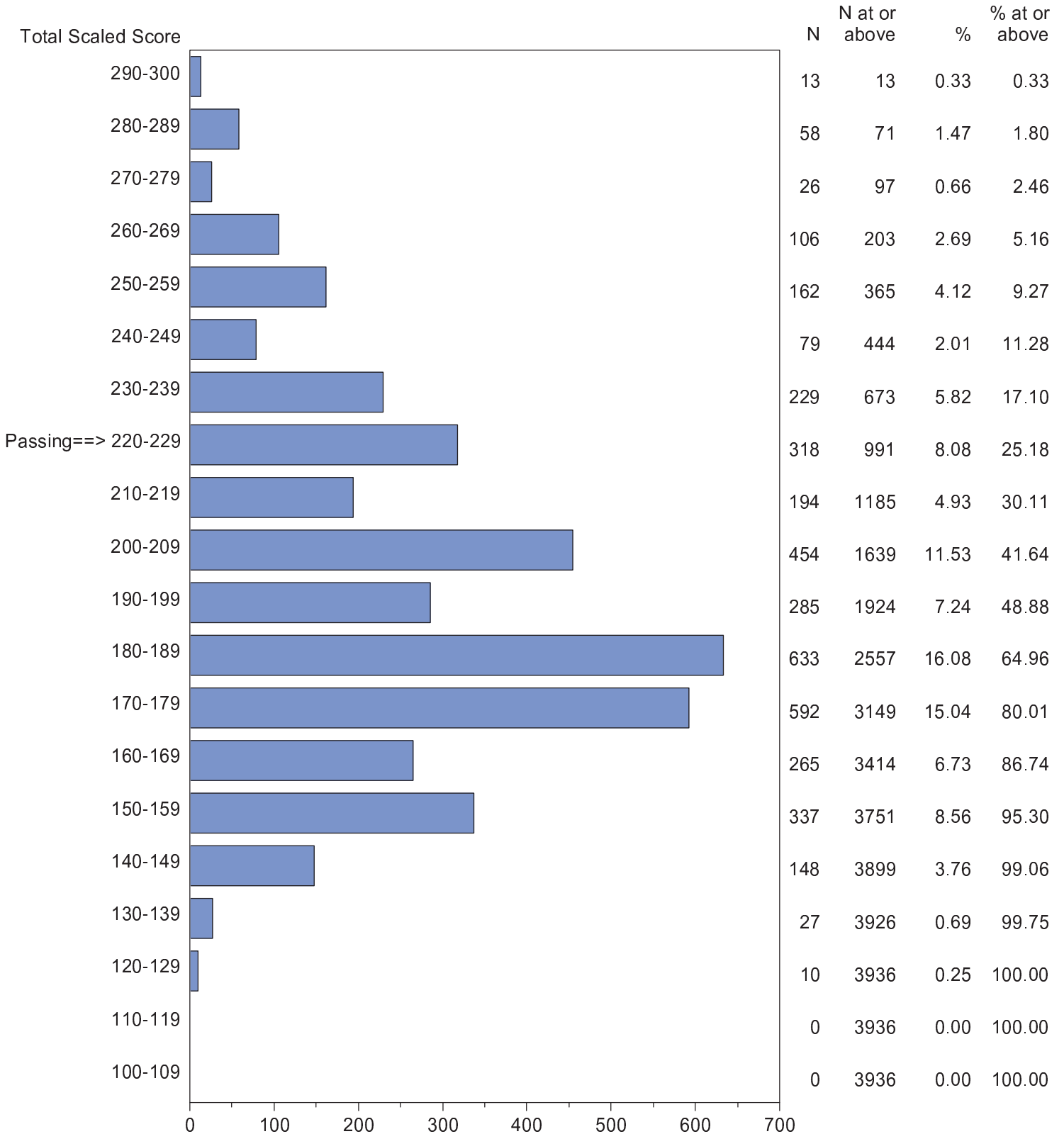
Test Field=002 Writing



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 Total Scaled Score Distribution by Test Field (All Forms)

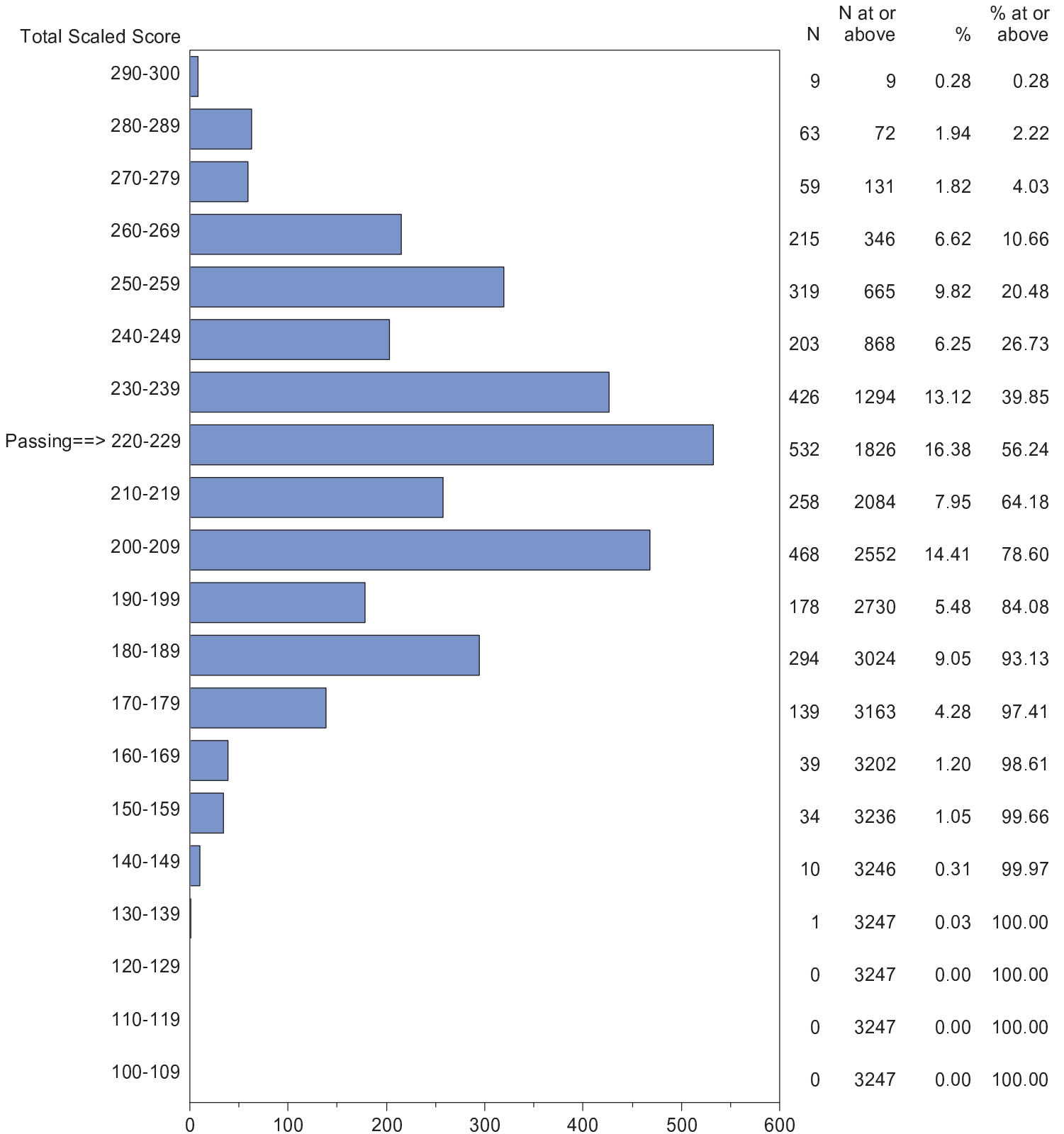
Test Field=003 Mathematics



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Missouri Educator Gateway Assessments (MEGA)
 September 1, 2014 - April 12, 2015
 Total Scaled Score Distribution by Test Field (All Forms)

Test Field=004 Science



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Missouri Educator Gateway Assessments (MEGA)
 September 1, 2014 - April 12, 2015
 Total Scaled Score Distribution by Test Field (All Forms)

Test Field=005 Social Studies

