

MICHIGAN TEST FOR TEACHER CERTIFICATION (MTTC)

TEST OBJECTIVES FIELD 083: ELEMENTARY EDUCATION

Subarea	Approximate Percentage of Questions on Test
Language Arts	24%
Mathematics	20%
Social Studies	15%
Science	15%
The Arts	13%
Health and Physical Education	13%

LANGUAGE ARTS

Understand the development of reading competence, including interactions among reader, text, and context.

Includes the development of emergent literacy in young children; factors affecting readers' construction of meaning through interactions with text (e.g., readers' prior knowledge; nature, genre, structure, and features of text; context of the reading act); and knowledge of different comprehension strategies for different purposes (e.g., reading a textbook to review for a test, reading for enjoyment).

Use vocabulary skills (e.g., structural analysis, contextual analysis) to determine meaning in given passages, and apply knowledge of vocabulary skills to reading.

Includes the use of word structure (e.g., phonetic analysis, syntactic cues, affixes) and context clues to determine the meaning of unfamiliar words; the use of context clues to determine the intended meaning of a word with multiple meanings; and recognition of ways in which figurative language (e.g., metaphor) is used in a given text.

Use literal and inferential comprehension skills in reading.

Includes recognizing facts and opinions, sequence of events, implied and stated main ideas, and supporting details in given texts; summarizing a given text accurately; drawing conclusions or making generalizations from information given; and drawing inferences (e.g., about character, setting, purpose, cause-and-effect relationships) from text.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

Use interpretive and evaluative comprehension skills in reading.

Includes analyzing an author's purpose or point of view in a given passage; using text characteristics (e.g., type, genre, structure) as an aid in constructing meaning; comparing or contrasting information presented in two or more passages; evaluating the use of language and illustrations to portray characters, develop plot, or create a mood in a given passage; and analyzing, interpreting, and evaluating the logic, credibility, objectivity, or emotional impact of a given passage.

Understand literature from various world cultures and regions and recognize characteristic features of various genres of literature (including fiction, nonfiction, and poetry).

Includes understanding diverse literary traditions and texts; recognizing characteristic features of major literary styles or given historical periods; recognizing ways in which a literary excerpt reflects themes or traditions associated with its time and place of origin; understanding key characteristics of genres of literature and their uses as sources of inspiration or modeling in writing; recognizing differences among genres of literature; and exploring and respecting commonalities and differences among people.

Understand genres of children's literature and issues related to children's literature (including equity issues).

Includes characteristic features associated with genres of children's literature; criteria for evaluating children's literature (e.g., equity issues, authentic portrayal); analysis of excerpts in relation to style or theme; and real-world uses of children's literature (e.g., promoting cultural awareness, addressing student issues, generating ideas for writing, connecting with students' knowledge bases).

Understand communication through the writing process.

Includes the knowledge and use of prewriting strategies (e.g., brainstorming, semantic mapping, outlining, reading and research); factors to consider in writing for various audiences and purposes (e.g., expressive, informative, persuasive); knowledge and use of text genres and structures (e.g., letter, poem, story, play); and strategies (e.g., peer conferences) and skills for drafting, editing, revising, proofreading, and publishing materials.

Use knowledge of English grammar and mechanics to revise writing.

Includes revising given texts in terms of sentence construction (e.g., revising run-on sentences, misplaced modifiers); subject-verb and pronoun-antecedent agreement; verb forms, pronouns, adverbs, adjectives, and plural and possessive nouns; and capitalization, punctuation, and spelling.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

Analyze and revise written work in relation to style, clarity, organization, and intended audience and purpose.

Includes revising text prepared for a given audience or purpose; improving organization and unity (e.g., adding transition words and phrases, reordering sentences or paragraphs, deleting unnecessary information, adding a topic sentence); and increasing text clarity, precision, and effectiveness through word choices.

Understand communication through the listening process.

Includes processes of audio perception and discrimination; attending to messages; assigning meaning; evaluating messages; responding to messages; and remembering message content.

Understand communication through the speaking process.

Includes understanding the elements of message content (e.g., ethical considerations, use of evidence and reasoning, use of language, audience analysis); applying structural considerations to messages (e.g., overall organization, relationships between ideas, use of introductions and conclusions); understanding how messages are affected by methods of presentation, nonverbal characteristics of speakers, and presentation aids; and seeking and providing feedback to messages.

Understand study and research skills and strategies.

Includes knowing strategies for studying information presented in texts and other media (e.g., previewing); applying note-taking and outlining skills; using a variety of written, oral, and visual sources of reference and the parts of a book (e.g., table of contents, glossary) to locate information; evaluating the appropriateness of reference sources for meeting given informational needs; and interpreting information presented in graphs and tables.

MATHEMATICS

Apply a variety of approaches to interpret and solve mathematical problems in real-world contexts.

Includes applying appropriate mathematical concepts or strategies (e.g., estimation, mental computation, working backwards, simplifying, modeling, pattern recognition) to solve a problem; evaluating the solution to a problem; and applying mathematical approaches to solve problems in a variety of contexts.

Understand mathematical communication and use mathematical terminology, symbols, and representations to communicate information.

Includes interpreting mathematical terminology, symbols, and representations; using graphic, numeric, symbolic, and verbal representations to communicate mathematical concepts and relationships; and converting among graphic, numeric, symbolic, and verbal representations.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

Understand concepts and skills related to whole numbers, number theory, and numeration, and apply this knowledge in problem-solving contexts.

Includes recognizing and comparing properties of whole numbers and the whole number system (e.g., commutative, distributive); recognizing different classes of problem situations related to whole number operations (e.g., partitive and measurement division); applying concepts of number and numeration systems to compare, order, and round; recognizing the logic of and relationships among mathematical operations; applying mathematical operations in real-world situations; and using a variety of materials, models, and methods to explore concepts and solve problems involving whole numbers and numeration.

Understand and apply concepts and skills related to rational numbers and the fraction, decimal, ratio, and percent interpretations.

Includes using integers, fractions, decimals, ratios, and percents to solve problems; comparing and ordering fractions, decimals, and percents; identifying equivalent forms of fractions, decimals, and percents; and using a variety of materials, models, and methods to explore concepts and solve problems involving integers, fractions, decimals, ratios, and percents.

Understand and apply algebraic concepts and methods.

Includes deriving algebraic expressions to represent real-world patterns, relationships, verbal expressions, symbols, and pictorial information; applying the concepts of variable, function, and equation to express relationships algebraically; using tables and graphs to explore relationships and make predictions; comparing and using expressions involving exponents, powers, and roots; and using a variety of materials, models, and methods to explore concepts and solve problems involving algebra.

Understand and apply principles, concepts, and procedures related to measurement.

Includes estimating and converting measurements within the customary and metric systems; applying procedures for using measurement to describe and compare phenomena; identifying appropriate measurement instruments, units, and procedures for measurement problems involving length, area, angles, volume, mass, time, money, and temperature; and using a variety of materials, models, and methods to explore concepts and solve problems involving measurement.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

Understand and apply principles and properties of geometry.

Includes recognizing types and properties of plane and space geometric figures; using basic geometric concepts (e.g., similarity, congruence, tessellations) and spatial sense to solve problems; identifying and applying geometric transformations; classifying figures according to symmetries; using coordinate systems on lines and planes to solve problems; and using a variety of materials, models, and methods to explore concepts and solve problems involving geometry.

Understand concepts and skills related to statistics and probability, and apply this knowledge to evaluate and interpret data and solve problems in real-world contexts.

Includes interpreting graphic and nongraphic representations of statistical data (e.g., frequency distributions, measures of central tendency, percentiles); applying concepts of statistics and probability to collect and organize data, identify patterns and trends, and draw conclusions; determining probabilities and making predictions based on simulations or theory; and using a variety of materials, models, and methods to explore concepts and solve problems involving statistics and probability.

Understand and apply formal and informal mathematical reasoning processes in a variety of contexts.

Includes analyzing problem situations, making conjectures, organizing information, and selecting strategies to solve problems; evaluating solutions to problems; constructing arguments and judging the validity or logic of arguments; and using logical reasoning to draw and justify conclusions from given information.

Understand the use of calculators and computers for mathematical exploration and problem solving.

Includes recognizing common uses of calculators and computers as tools for learning, exploration, and problem solving; analyzing the benefits and limitations of calculators and computers in problem solving situations; and using strategies and activities involving calculators and computers to investigate and solve mathematical problems.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

SOCIAL STUDIES

Understand democratic principles, practices, values, and beliefs, and the rights and responsibilities of citizenship in the United States.

Includes basic democratic principles and rights (e.g., freedom of speech, assembly, and worship; due process; equal protection of the laws) and their significance and current applications for individuals and society; and responsibilities of U.S. citizens, including classroom, school, and community applications (e.g., respecting others' rights, obeying laws and rules, becoming informed and voting, expressing dissent).

Understand cultural diversity and the historical and contemporary role of cultural diversity in shaping Michigan, the United States, and world areas.

Includes the nature and implications of commonalities and differences among groups; and ways in which cultural groups (e.g., African Americans, Asian Americans, Hispanic Americans, Native Americans) and cultural diversity in general have influenced historical and contemporary developments in Michigan, the United States, and world areas, including non-Western cultures.

Understand global interdependence and social, political, economic, and environmental issues that affect world citizens.

Includes recognizing types of relationships among people of different world regions (e.g., economic, political, historical, ecological, linguistic, cultural relationships); identifying issues that affect people throughout the world (e.g., food production, human rights, resource use, prejudice, poverty, trade); analyzing relationships among global issues (e.g., how population patterns and poverty are interrelated); and recognizing the relationship between local decisions and global issues (e.g., how individual or community actions regarding waste disposal or recycling may affect worldwide resource availability).

Understand major geographic concepts and issues and analyze interrelationships among geography, culture, and society in Michigan, the United States, and world regions.

Includes applying the basic concepts of geography (e.g., location, movement, interaction) to situations and developments in Michigan, the United States, and world areas; analyzing interactions between people and the environment (e.g., food distribution, poverty, ecological balance, industrial development); recognizing the cultural effects of the migration of people and the diffusion of ideas; and using globes, maps, and other resources to interpret geographical information and explore geographical themes.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

Understand major historical developments in Michigan and the United States and analyze their significance from a variety of perspectives, including multicultural perspectives.

Includes applying historical concepts and themes to an analysis of events and trends in the history of the United States through the Civil War and Michigan to the present (e.g., cultural diversity, the impact of technology on society, the role of women, family arrangements, work patterns, racial/ethnic relations, etc.); placing individuals, groups, ideas, and institutions into a social, cultural, and historical context; analyzing change and continuity in social values, attitudes, and behaviors; and recognizing relationships between geographic factors and historical developments.

Understand basic economic concepts in the United States and the world, including the role of the producer and the consumer.

Includes fundamental concepts and principles of economics (e.g., wants, resources, and scarcity; supply and demand; money and exchange; global interdependence); major features of economic systems; key features of the U.S. market system; and the roles and responsibilities of consumers and producers in a market economy (e.g., in relation to advertising practices, peer pressure, resource conservation).

Understand and apply knowledge of various political systems and the structures, functions, and principles of local and state governments, including the role and function of law in a democratic society.

Includes the basic purpose and concepts of government; the significance of major events, documents, and individuals that shaped government; the basic functions of the legislative, executive, and judicial branches of state and local governments in the United States; and the role and function of rules and law in the community and state (e.g., how laws relate to social issues, ethics, and morality).

Understand and apply skills and procedures related to locating, organizing, and interpreting social studies information and using social studies concepts and processes.

Includes appropriate resources, media, or technology for meeting specified informational needs; organizing, comparing, interpreting, evaluating, and summarizing social studies information presented in oral, graphic, and written form; and skills and procedures related to group and individual problem solving, decision making, conflict resolution, and hypothesis formulation and testing.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

SCIENCE

Understand and apply basic concepts and principles of life science.

Includes recognition of basic concepts and processes related to cells, organization of living things, heredity, evolution, and ecosystems; understanding major themes of the life sciences (e.g., flow of energy, systems, interactions); and application of this knowledge to interpret and analyze natural phenomena.

Understand and apply basic concepts and principles of physical science.

Includes recognition of basic concepts and processes related to matter and energy, changes in matter, motion of objects, and waves and vibrations; understanding major themes of the physical sciences (e.g., energy, constancy, models); and application of this knowledge to interpret and analyze everyday phenomena.

Understand and apply basic concepts and principles of earth science.

Includes recognition of basic concepts and processes related to the geosphere, the hydrosphere, the atmosphere and weather, and the solar system and the universe; understanding major themes of earth science (e.g., patterns of change, scale); and application of this knowledge to interpret and analyze natural phenomena.

Understand materials, equipment, mathematical tools, technology, and safety issues and procedures related to classroom and other science investigations.

Includes recognizing materials, equipment, mathematical tools (e.g., averaging, counting, timing), and technology for observation, measurement, and analysis in classroom and other science investigations; and understanding necessary health and safety measures for given situations.

Understand and apply principles and procedures of experimental design.

Includes identifying procedures and considerations in setting up and conducting experiments; using control and experimental groups to test hypotheses; and recognizing variables being held constant, those being manipulated, and those responding.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

Understand principles and procedures for gathering, organizing, interpreting, evaluating, and communicating data in the life, physical, and earth sciences.

Includes applying procedures for generating questions about the world; systematically observing phenomena; gathering information from a variety of sources; selecting appropriate measurement methods and instruments for describing and comparing phenomena; organizing data gathered through observation and experimentation; communicating and interpreting data presented in a variety of formats (e.g., graphs, diagrams, maps, concrete models, role playing); and evaluating strengths and weaknesses of claims and arguments based on data.

Understand interrelationships among the life, physical, and earth sciences and among science, mathematics, and technology.

Includes recognizing key themes and concepts that link the science disciplines (e.g., themes such as classification, change over time, cause and effect; concepts such as energy, molecule, conservation) and science, mathematics, and technology; and applying knowledge of common themes and concepts to real-world contexts.

Understand the foundations of scientific thought, the historical development of major scientific ideas, and relationships between science, technology, and society.

Includes recognizing values inherent in science (e.g., reliance on verifiable evidence, reasoning, and logical arguments; avoidance of bias); the historical development and significance of key scientific ideas, including the contributions of individuals from diverse backgrounds; cultural and social contexts of science; and the advantages, effects, and costs of scientific and technological changes.

THE ARTS

Understand historical, cultural, and societal contexts for the visual and performing arts (art, music, drama/theatre, dance).

Includes recognizing the visual and performing arts in different historical periods and societies; understanding ways in which artistic works reflect their periods or cultures of origin; identifying the role of the arts in diverse past and contemporary societies; and understanding diverse artistic traditions and exploring and respecting commonalities and differences among people.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

Understand concepts and skills for creating, viewing, and evaluating visual art.

Includes knowledge of appropriate art materials and activities to promote individual self-expression, aesthetic awareness, and physical, perceptual, creative, and problem-solving skills; identifying tools and techniques used to create two- and three-dimensional art (e.g., drawing, painting, printmaking, weaving); recognizing elements (e.g., line, color, texture) and principles (e.g., unity, balance) of the visual arts; and applying skills for critically evaluating artworks.

Understand concepts and skills for producing, listening to, and responding to music.

Includes knowledge of appropriate materials and activities for promoting individual self-expression (through singing, playing, and moving), aesthetic awareness, and physical, perceptual, creative, problem-solving, and critical analysis skills; recognizing common musical terms and concepts (e.g., harmony, rhythm, melody); and identifying types and characteristics of instrumental and vocal music from various cultures.

Understand concepts and skills related to creative drama.

Includes knowledge of appropriate dramatic activities (e.g., role playing, creative drama, puppetry, pantomime, improvisation) for promoting individual self-expression, aesthetic awareness, and physical, perceptual, creative, problem-solving, and critical analysis skills; applying basic terms and concepts related to creative drama; and recognizing the role of creative drama activities in the elementary classroom.

Understand and promote the aesthetic and personal dimensions of the arts.

Includes recognizing the intrinsic value of artistic experiences; identifying reasons that people create, perform, and participate in the arts; recognizing how a personal aesthetic philosophy may be formed and developed; and fostering an appreciation of the arts as ways to create meaning, express ideas, explore feelings, and share life experiences.

HEALTH AND PHYSICAL EDUCATION

Understand principles and practices related to nutrition, growth and development, personal health, and safety.

Includes understanding the importance of varied food choices and the positive and negative effects of food choices on health and growth; principles of personal hygiene; injury and accident avoidance; social and legal aspects of child abuse; factors influencing growth and development and proper functioning of body systems; the benefits of rest, sleep, and exercise; and the use of decision-making and problem-solving skills for making healthy choices.

TEST OBJECTIVES
FIELD 083: ELEMENTARY EDUCATION

Understand principles and practices related to family health, community health, and consumer health.

Includes ways in which family roles, relationships, and culture affect family health; the influence of various factors (e.g., pollution, economic equity) on community health; strategies for promoting environmental health; roles of health care providers and agencies; sources of information about health care products and services; and the use of decision-making and problem-solving skills to promote family, community, and consumer health.

Understand principles and practices related to disease prevention and control and substance use and abuse.

Includes understanding the difference between being "well" and being "ill"; distinguishing between communicable, chronic, and degenerative disease processes; recognizing ways to prevent or lower the risk of disease, including AIDS; understanding aspects and consequences (including health, social, and legal) of substance use and abuse; understanding alternatives to substance use and abuse and aspects of treatment and control; and using decision-making and problem-solving skills to make healthy choices.

Understand principles and practices of physical education as applied to individual development.

Includes fundamental motor, body control, and perceptual awareness skills and appropriate activities to promote development of individuals with diverse needs; components of fitness (e.g., cardiovascular endurance, flexibility, coordination) and activities to promote lifelong fitness; and safety practices associated with physical activities.

Understand principles and practices of health and physical education as applied to the development of personal and social skills.

Includes the use of health and physical education activities to promote the development of personal and social skills (e.g., responsibility, leadership, conflict resolution skills, positive self-concept, cooperation, fair play).