

## Prepared Graduate Competencies in Mathematics

The prepared graduate competencies are the preschool through twelfth-grade concepts and skills that all students who complete the Colorado education system must master to ensure their success in a postsecondary and workforce setting.

Prepared graduates in mathematics:

- Understand the structure and properties of our number system. At their most basic level numbers are abstract symbols that represent real-world quantities
- Understand quantity through estimation, precision, order of magnitude, and comparison. The reasonableness of answers relies on the ability to judge appropriateness, compare, estimate, and analyze error
- Are fluent with basic numerical and symbolic facts and algorithms, and are able to select and use appropriate (mental math, paper and pencil, and technology) methods based on an understanding of their efficiency, precision, and transparency
- Make both relative (multiplicative) and absolute (arithmetic) comparisons between quantities. Multiplicative thinking underlies proportional reasoning
- Recognize and make sense of the many ways that variability, chance, and randomness appear in a variety of contexts
- Solve problems and make decisions that depend on understanding, explaining, and quantifying the variability in data
- Understand that equivalence is a foundation of mathematics represented in numbers, shapes, measures, expressions, and equations
- Make sound predictions and generalizations based on patterns and relationships that arise from numbers, shapes, symbols, and data
- Apply transformation to numbers, shapes, functional representations, and data
- Make claims about relationships among numbers, shapes, symbols, and data and defend those claims by relying on the properties that are the structure of mathematics
- Communicate effective logical arguments using mathematical justification and proof. Mathematical argumentation involves making and testing conjectures, drawing valid conclusions, and justifying thinking
- Use critical thinking to recognize problematic aspects of situations, create mathematical models, and present and defend solutions

## Prepared Graduate Competencies in Science

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Prepared Graduates:

- Observe, explain, and predict natural phenomena governed by Newton's laws of motion, acknowledging the limitations of their application to very small or very fast objects
- Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical and nuclear reactions
- Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable
- Analyze the relationship between structure and function in living systems at a variety of organizational levels, and recognize living systems' dependence on natural selection
- Explain and illustrate with examples how living systems interact with the biotic and abiotic environment
- Analyze how various organisms grow, develop, and differentiate during their lifetimes based on an interplay between genetics and their environment
- Explain how biological evolution accounts for the unity and diversity of living organisms
- Describe and interpret how Earth's geologic history and place in space are relevant to our understanding of the processes that have shaped our planet
- Evaluate evidence that Earth's geosphere, atmosphere, hydrosphere, and biosphere interact as a complex system
- Describe how humans are dependent on the diversity of resources provided by Earth and Sun

## Prepared Graduate Competencies in Reading, Writing, and Communicating

The preschool through twelfth-grade concepts and skills that all students who complete the Colorado education system must master to ensure their success in a postsecondary and workforce setting.

### Prepared Graduates:

- Collaborate effectively as group members or leaders who listen actively and respectfully pose thoughtful questions, acknowledge the ideas of others, and contribute ideas to further the group's attainment of an objective
- Deliver organized and effective oral presentations for diverse audiences and varied purposes
- Use language appropriate for purpose and audience
- Demonstrate skill in inferential and evaluative listening
- Interpret how the structure of written English contributes to the pronunciation and meaning of complex vocabulary
- Demonstrate comprehension of a variety of informational, literary, and persuasive texts
- Evaluate how an author uses words to create mental imagery, suggest mood, and set tone
- Read a wide range of literature (American and world literature) to understand important universal themes and the human experience
- Seek feedback, self-assess, and reflect on personal learning while engaging with increasingly more difficult texts
- Engage in a wide range of nonfiction and real-life reading experiences to solve problems, judge the quality of ideas, or complete daily tasks
- Write with a clear focus, coherent organization, sufficient elaboration, and detail
- Effectively use content-specific language, style, tone, and text structure to compose or adapt writing for different audiences and purposes
- Apply standard English conventions to effectively communicate with written language
- Implement the writing process successfully to plan, revise, and edit written work
- Master the techniques of effective informational, literary, and persuasive writing
- Discriminate and justify a position using traditional lines of rhetorical argument and reasoning
- Articulate the position of self and others using experiential and material logic
- Gather information from a variety of sources; analyze and evaluate the quality and relevance of the source; and use it to answer complex questions
- Use primary, secondary, and tertiary written sources to generate and answer research questions
- Evaluate explicit and implicit viewpoints, values, attitudes, and assumptions concealed in speech, writing, and illustration
- Demonstrate the use of a range of strategies, research techniques, and persistence when engaging with difficult texts or examining complex problems or issues
- Exercise ethical conduct when writing, researching, and documenting sources

[Return to the Reading, Writing, and Communicating Standards \(/coreadingwriting/StateStandards.asp\)](#)

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## Prepared Graduate Competencies in Social Studies

The prepared graduate competencies are the preschool through twelfth-grade concepts and skills that all students who complete the Colorado education system must master to ensure their success in a postsecondary and workforce setting.

Prepared graduates in social studies:

1. Use the tools, thinking, and practices of history, geography, economics, and civics to:
  - a. Solve problems, make decisions and analyze issues from multiple perspectives as a responsible member of society
  - b. Read, write, and communicate ideas

Prepared graduates in history:

1. Develop an understanding of how people view, construct, and interpret history
2. Analyze key historical periods and patterns of change over time within and across nations and cultures

Prepared graduates in geography:

1. Develop spatial understanding, perspectives, and personal connections to the world
2. Examine places and regions and the connections among them

Prepared graduates in economics:

1. Understand the allocation of scarce resources in societies through analysis of individual choice, market interaction, and public policy
2. Acquire the knowledge and economic reasoning skills to make sound financial decisions (PFL)

Prepared graduates in civics:

1. Analyze and practice rights, roles, and responsibilities of citizens
2. Analyze the origins, structure, and functions of governments and their impacts on societies and citizens