



**Geography:** Geography provides students with an understanding of spatial perspectives and technologies for spatial analysis, awareness of interdependence of world regions and resources and how places are connected on local, national and global scales.

The study of geography creates an informed person with an understanding of spatial perspective and technologies for spatial analysis; and an awareness of the interdependence of the world regions and resources, and how places are connected at the local, national, and global scales. Students understand the complexity and interrelatedness of people, places, and environments. Geography helps students appreciate the dynamic relationships and complexity of the world.

The skills, concepts, and knowledge acquired in geography are fundamental literacy components for a 21st century student. Use of critical thinking, information literacy, collaboration, self-direction, and invention are apparent in every facet of geographic education. Geography helps students develop a framework for understanding the world, ultimately contributing to the creation of informed citizens.

### **Standards in Science**

- 1. Physical Science:* Students know and understand common properties, forms, and changes in matter and energy.
- 2. Life Science:* Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
- 3. Earth Systems Science:* Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.

## **Prepared Graduates**

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 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 science:

1. 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
2. Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical and nuclear reactions
3. Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable
4. Analyze the relationship between structure and function in living systems at a variety of organizational levels, and recognize living systems' dependence on natural selection
5. Explain and illustrate with examples how living systems interact with the biotic and abiotic environment
6. Analyze how various organisms grow, develop, and differentiate during their lifetimes based on an interplay between genetics and their environment
7. Explain how biological evolution accounts for the unity and diversity of living organisms
8. 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
9. Evaluate evidence that Earth's geosphere, atmosphere, hydrosphere, and biosphere interact as a complex system
10. Describe how humans are dependent on the diversity of resources provided by Earth and Sun

## Grade Level Expectations

### High School

1. Use different types of maps and geographic tools to analyze features on Earth to investigate and solve geographic questions

*Students can:*

- a. Gather data, make inferences and draw conclusions from maps and other visual representations
- b. Create and interpret various graphs, tables, charts, and thematic maps
- c. Analyze and present information using a variety of geographic tools and geographic findings in graphs, tables, charts, and thematic maps
- d. Locate physical and human features and evaluate their implications for society

2. Explain and interpret geographic variables that influence the interaction of people, places, and environments

*Students can:*

- a. Apply geography skills to help investigate issues and justify possible resolutions involving people, places, and environments. Topics to include but not limited to how people prepare for and respond to natural hazards
- b. Identify, evaluate, and communicate strategies to respond to constraints placed on human systems by the physical environment
- c. Explain how altering the environment has brought prosperity to some places and created environmental dilemmas for others
- d. Research and interpret multiple viewpoints on issues that shaped the current policies and programs for resource use
- e. Explain how information and changing perceptions and values of places and environment influence personal actions
- f. Define sustainability and explain how an individual's actions may influence sustainability

3. The interconnected nature of the world, its people and places

*Students can:*

- a. Explain how the uneven distribution of resources in the world can lead to conflict, competition, or cooperation among nations, regions, and cultural groups
- b. Explain that the world's population is increasingly connected to and dependent upon other people for both human and natural resources
- c. Explain how migration of people and movement of goods and ideas can enrich cultures, but also create tensions
- d. Analyze how cooperation and conflict influence the division and control of Earth
- e. Analyze patterns of distribution and arrangements of settlements and the processes of the diffusion of human activities
- f. Make predictions and draw conclusions about the global impact of cultural diffusion

### Life Science

1. Matter tends to be cycled within an ecosystem, while energy is transformed and eventually exits an ecosystem

2. The size and persistence of populations depend on their interactions with each other and on the abiotic factors in an ecosystem

### Earth Systems Science

1. The history of the universe, solar system and Earth can be inferred from evidence left from past events

2. As part of the solar system, Earth interacts with various extraterrestrial forces and energies such as gravity, solar phenomena, electromagnetic radiation, and impact events that influence the planet's geosphere, atmosphere, and biosphere in a variety of ways

*Students can:*

d. Use specific equipment, technology, and resources such as satellite imagery, global positioning systems (GPS), global information systems (GIS), telescopes, video and image libraries, and computers to explore the universe

3. The theory of plate tectonics helps to explain geological, physical, and geographical features of Earth

4. Climate is the result of energy transfer among interactions of the atmosphere, hydrosphere, geosphere, and biosphere

*Students can:*

a. Develop, communicate, and justify an evidence-based scientific explanation that shows climate is a result of energy transfer among the atmosphere, hydrosphere, geosphere and biosphere

b. Analyze and interpret data on Earth's climate

c. Explain how a combination of factors such as Earth's tilt, seasons, geophysical location, proximity to oceans, landmass location, latitude, and elevation determine a location's climate

d. Identify mechanisms in the past and present that have changed Earth's climate

e. Analyze the evidence and assumptions regarding climate change

f. Interpret evidence from weather stations, buoys, satellites, radars, ice and ocean sediment cores, tree rings, cave deposits, native knowledge, and other sources in relation to climate change

5. There are costs, benefits, and consequences of exploration, development, and consumption of renewable and nonrenewable resources

*Students can:*

a. Develop, communicate, and justify an evidence-based scientific explanation regarding the costs and benefits of exploration, development, and consumption of renewable and nonrenewable resources

b. Evaluate positive and negative impacts on the geosphere, atmosphere, hydrosphere, and biosphere in regards to resource use

c. Create a plan to reduce environmental impacts due to resource consumption

d. Analyze and interpret data about the effect of resource consumption and development on resource reserves to draw conclusions about sustainable use

6. The interaction of Earth's surface with water, air, gravity, and biological activity causes physical and chemical changes

*Students can:*

a. Develop, communicate, and justify an evidence-based scientific explanation addressing questions regarding the interaction of Earth's surface with water, air, gravity, and biological activity

- b. Analyze and interpret data, maps, and models concerning the direct and indirect evidence produced by physical and chemical changes that water, air, gravity, and biological activity create
  - c. Evaluate negative and positive consequences of physical and chemical changes on the geosphere
  - d. Use remote sensing and geographic information systems (GIS) data to interpret landforms and landform impact on human activity
7. Natural hazards have local, national and global impacts such as volcanoes, earthquakes, tsunamis, hurricanes, and thunderstorms

*Students can:*

- a. Develop, communicate, and justify an evidence-based scientific explanation regarding natural hazards, and explain their potential local and global impacts
- b. Analyze and interpret data about natural hazards using direct and indirect evidence
- c. Make predictions and draw conclusions about the impact of natural hazards on human activity – locally and globally

## Eighth Grade

1. Use geographic tools to analyze patterns in human and physical systems

*Students can:*

- a. Interpret maps and other geographic tools as a primary source to analyze a historic issue
- b. Describe the nature and spatial distribution of cultural patterns
- c. Recognize the patterns and networks of economic interdependence
- d. Explain the establishment of human settlements in relationship to physical attributes and important regional connections
- e. Calculate and analyze population trends

2. Conflict and cooperation occur over space and resources

*Students can:*

- a. Analyze how economic, political, cultural, and social processes interact to shape patterns of human population, interdependence, cooperation and conflict
- b. Compare how differing geographic perspectives apply to a historic issue
- c. Interpret from a geographic perspective the expansion of the United States by addressing issues of land, security, and sovereignty

## Life Sciences

1. Human activities can deliberately or inadvertently alter ecosystems and their resiliency

## Earth Systems Science

1. Weather is a result of complex interactions of Earth's atmosphere, land and water, that are driven by energy from the sun, and can be predicted and described through complex models

*Students can:*

- a. Differentiate between basic and severe weather conditions, and develop an appropriate action plan for personal safety and the safety of others
- b. Observe and gather data for various weather conditions and compare to historical data for that date and location
- c. Use models to develop and communicate a weather prediction

2. Earth has a variety of climates defined by average temperature, precipitation, humidity, air pressure, and wind that have changed over time in a particular location

*Students can:*

- a. Develop, communicate and justify an evidence-based scientific explanation to account for Earth's different climates
  - b. Research and evaluate direct and indirect evidence to explain how climates vary from one location to another on Earth
  - c. Examine, evaluate, and question information from a variety of sources and media to investigate how climates vary from one location to another on Earth
4. The relative positions and motions of Earth, Moon, and Sun can be used to explain observable effects such as seasons, eclipses, and Moon phases

*Students can:*

- b. Analyze and interpret data to explain why we have seasons

## Seventh Grade

1. Use geographic tools to gather data and make geographic inferences and predictions

*Students can:*

- a. Interpret maps and other geographic tools to find patterns in human and physical systems
- b. Describe the characteristics and distribution of physical systems, cultural patterns and economic interdependence to make predictions. Topics to include but not limited to environmental issues and cultural diffusion
- c. Collect and analyze data to make geographic inferences and predictions regarding the Eastern Hemisphere
- d. Ask and answer questions after examining geographic sources

2. Regions have different issues and perspectives

*Students can:*

- a. Classify data to construct thematic maps and make inferences
- b. Analyze and interpret data using geographic tools and create maps
- c. Construct maps using fundamental principles to identify key information and analyze regional issues and perspectives in the Eastern Hemisphere
- d. Explain how the physical environment of a place influences its economy, culture, and trade patterns

## Earth Systems Science

1. Major geologic events such as earthquakes, volcanic eruptions, mid-ocean ridges, and mountain formation are associated with plate boundaries and attributed to plate motions

*Students can:*

- c. Use maps to locate likely geologic “hot spots”, using evidence of earthquakes and volcanic activity
- d. Use web-based or other technology tools to show connections and patterns in data about tectonic plate boundaries and earthquakes, volcanic eruptions, and mountain formation

## Sixth Grade

1. Use geographic tools to solve problems

*Students can:*

- a. Use longitude, latitude, and scale on maps and globes to solve problems
- b. Collect and analyze data to interpret regions in the Western Hemisphere
- c. Ask multiple types of questions after examining geographic sources
- d. Interpret and communicate geographic data to justify potential solutions to problems
- e. Distinguish different types of maps and use them in analyzing an issue

2. Human and physical systems vary and interact

*Students can:*

- a. Classify and analyze the types of connections between places
- b. Identify physical features and explain their effects on people in the Western Hemisphere
- c. Give examples of how people have adapted to their physical environment
- d. Analyze positive and negative interactions of human and physical systems in the Western Hemisphere

## Life Science

1. Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species
2. Organisms interact with each other and their environment in various ways that create a flow of energy and cycling of matter in an ecosystem

## Earth Systems Science

1. Complex interrelationships exist between Earth's structure and natural processes that over time are both constructive and destructive

### *Students can:*

- a. Gather, analyze, and communicate an evidence-based explanation for the complex interaction between Earth's constructive and destructive forces
- b. Gather, analyze and communicate evidence from text and other sources that explains the formation of Earth's surface features

2. Water on Earth is distributed and circulated through oceans, glaciers, rivers, ground water, and the atmosphere

### *Students can:*

- a. Gather and analyze data from a variety of print resources and investigations to account for local and world-wide water circulation and distribution patterns
- b. Use evidence to model how water is transferred throughout the earth
- c. Identify problems, and propose solutions related to water quality, circulation, and distribution – both locally and worldwide
- d. Identify the various causes and effects of water pollution in local and world water distributions
- e. Describe where water goes after it is used in houses or buildings

3. Earth's natural resources provide the foundation for human society's physical needs. Many natural resources are nonrenewable on human timescales, while others can be renewed or recycled

### *Students can:*

- a. Research and evaluate data and information to learn about the types and availability of various natural resources, and use this knowledge to make evidence-based decisions
- b. Identify and evaluate types and availability of renewable and nonrenewable resources
- c. Use direct and indirect evidence to determine the types of resources and their applications used in communities



## Fifth Grade

1. Use various geographic tools and sources to answer questions about the geography of the United States

*Students can:*

- a. Answer questions about regions of the United States using various types of maps
- b. Use geographic tools to identify, locate, and describe places and regions in the United States and suggest reasons for their location
- c. Locate resources in the United States and describe the influence of access on the development of local and regional communities

2. Causes and consequences of movement

*Students can:*

- a. Identify variables associated with discovery, exploration, and migration
- b. Explain migration, trade, and cultural patterns that result from interactions
- c. Describe and analyze how specific physical and political features influenced historical events, movements, and adaptation to the environment
- d. Analyze how cooperation and conflict among people contribute to political, economic, and social divisions in the United States
- e. Give examples of the influence of geography on the history of the United States

## Earth Systems Science

1. Earth and sun provide a diversity of renewable and nonrenewable resources

2. Earth's surface changes constantly through a variety of processes and forces

*Students can:*

- a. Analyze and interpret data identifying ways Earth's surface is constantly changing through a variety of processes and forces such as plate tectonics, erosion, deposition, solar influences, climate, and human activity
  - b. Develop and communicate an evidence based scientific explanation around one or more factors that change Earth's surface
3. Weather conditions change because of the uneven heating of Earth's surface by the Sun's energy. Weather changes are measured by differences in temperature, air pressure, wind and water in the atmosphere and type of precipitation

*Students can:*

- a. Develop and communicate an evidence-based scientific explanation for changes in weather conditions
- b. Gather, analyze, and interpret data such as temperature, air pressure, wind, and humidity in relation to daily weather conditions
- c. Describe weather conditions based on data collected using a variety of weather tools
- d. Use data collection tools and measuring devices to gather, organize, and analyze data such as temperature, air pressure, wind, and humidity in relation to daily weather conditions

## Fourth Grade

1. Use several types of geographic tools to answer questions about the geography of Colorado

*Students can:*

- a. Answer questions about Colorado regions using maps and other geographic tools
- b. Use geographic grids to locate places on maps and images to answer questions
- c. Create and investigate geographic questions about Colorado in relation to other places
- d. Illustrate, using geographic tools, how places in Colorado have changed and developed over time due to human activity
- e. Describe similarities and differences between the physical geography of Colorado and its neighboring states

2. Connections within and across human and physical systems are developed

*Students can:*

- a. Describe how the physical environment provides opportunities for and places constraints on human activities
- b. Explain how physical environments influenced and limited immigration into the state
- c. Analyze how people use geographic factors in creating settlements and have adapted to and modified the local physical environment
- d. Describe how places in Colorado are connected by movement of goods and services and technology

## Life Science

1. All living things share similar characteristics, but they also have differences that can be described and classified

3. There is interaction and interdependence between and among living and nonliving components of systems

### Third Grade

1. Use various types of geographic tools to develop spatial thinking

*Students can:*

- a. Read and interpret information from geographic tools and formulate geographic questions
- b. Find oceans and continents, major countries, bodies of water, mountains, and urban areas, the state of Colorado, and neighboring states on maps
- c. Locate the community on a map and describe its natural and human features
- d. Identify geography-based problems and examine the ways that people have tried to solve them

2. The concept of regions is developed through an understanding of similarities and differences in places

*Students can:*

- a. Observe and describe the physical characteristics and the cultural and human features of a region
- b. Identify the factors that make a region unique including cultural diversity, industry and agriculture, and land forms
- c. Give examples of places that are similar and different from a local region
- d. Characterize regions using different types of features such as physical, political, cultural, urban and rural

### Earth Systems Science

1. Earth's materials can be broken down and/or combined into different materials such as rocks, minerals, rock cycle, formation of soil, and sand – some of which are usable resources for human activity

## Second Grade

1. Use geographic terms and tools to describe space and place

*Students can:*

- a. Use map keys ,legends, symbols, intermediate directions, and compass rose to derive information from various maps
- b. Identify and locate various physical features on a map
- c. Identify the hemispheres, equator, and poles on a globe
- d. Identify and locate cultural, human, political, and natural features using map keys and legends

2. People in communities manage, modify, and depend on their environment

*Students can:*

- a. Identify how communities manage and use nonrenewable and renewable resources
- b. Identify local boundaries in the community
- c. Explain why people settle in certain areas
- d. Identify examples of physical features that affect human activity
- e. Describe how the size and the character of a community change over time for geographic reasons

## Life Science

1. Organisms depend on their habitat's nonliving parts to satisfy their needs

2. Each plant or animal has different structures or behaviors that serve different functions

## Earth Systems Science

1. Weather and the changing seasons impact the environment and organisms such as humans, plants, and other animals

*Students can:*

- a. Use evidence to develop a scientific explanation for how the weather and changing seasons impacts the organisms such as humans, plants, and other animals – and the environment
- b. Analyze and interpret data such as temperatures in different locations (Sun or shade) at different times and seasons as evidence of how organisms and the environment are influenced by the weather and changing seasons
- c. Analyze ways in which severe weather contributes to catastrophic events such as floods and forest fires

## First Grade

1. Geographic tools such as maps and globes to represent places

*Students can:*

- a. Explain that maps and globes are different representations of Earth
- b. Use terms related to directions - forward and backward, left and right – and distance – near and far – when describing locations
- c. Recite address including city, state, and country and explain how those labels help find places on a map
- d. Distinguish between land and water on a map or globe
- e. Create simple maps showing both human and natural features

2. People in different groups and communities interact with each other and the environment

*Students can:*

- a. Identify examples of boundaries that affect family and friends
- b. Give examples of how people use and interrelate with Earth’s resources
- c. Identify how community activities differ due to physical and cultural characteristics
- d. Give examples of how schools and neighborhoods in different places are alike and different
- e. Identify cultural and family traditions and their connections to other groups and the environment

## Kindergarten

1. People belong to different groups and live in different settings around the world that can be found on a map or globe

*Students can:*

- a. Compare and contrast how people live in different settings around the world
- b. Give examples of food, clothing, and shelter and how they change in different environments
- c. Distinguish between a map and a globe as ways to show places people live

## Preschool

1. Develop spatial understanding, perspectives, and connections to the world

*Students can:*

- a. Use positional phrasing. Phrases to include but not limited to: over and under, here and there, inside and outside, up and down
- b. Identify common places to include but limited to home, school, cafeteria, and gymnasium
- c. Describe surroundings
- d. Use pictures to locate familiar places
- e. Use nonlinguistic representations to show understanding of geographic terms

## Physical Science

1. Objects have properties and characteristics

*Students can:*

- a. Use senses to gather information about objects
- b. Make simple observations, predictions, explanations, and generalizations based on real-life experiences
- c. Collect, describe, and record information through discussion, drawings, and charts

2. There are cause-and-effect relationships in everyday experiences

*Students can:*

- a. Recognize and investigate cause-and-effect relationships in everyday experiences – pushing, pulling, kicking, rolling, or blowing objects

Life Science

1. Living things have characteristics and basic needs

*Students can:*

- a. Use senses to gather information about living things
  - b. Observe and explore the natural processes of growing, changing, and adapting to the environment
  - c. Ask and pursue questions through simple investigations and observations of living things
  - d. Collect, describe, and record information about living things through discussion, drawings, and charts
2. Living things develop in predictable patterns

*Students can:*

- a. Identify the common needs such as food, air, and water of familiar living things
- b. Predict, explain, and infer patterns based on observations and representations of living things, their needs, and life cycles
- c. Make and record by drawing, acting out, or describing observations of living things and how they change over time

Earth Systems Science

1. Earth's materials have properties and characteristics that affect how we use those materials

*Students can:*

- a. Use senses to gather information about Earth's materials
  - b. Make simple observations, explanations, and generalizations about Earth's materials based on real life experiences
  - c. Describe how various materials might be used based on characteristics or properties
2. Events such as night, day, the movement of objects in the sky, weather, and seasons have patterns

*Students can:*

- a. Identify, predict, and extend patterns based on observations and representations of objects in the sky, daily weather, and seasonal changes
- b. Observe and describe patterns observed over the course of a number of days and nights, possibly including differences in the activities or appearance of plants and animals

## **21st Century Skills and Readiness Competencies in Social Studies**

The social studies subcommittees embedded 21st century skills, school readiness, and postsecondary and workforce readiness skills into the draft revised standards utilizing descriptions developed by Coloradans and vetted by educators, policymakers, and citizens.

### **Colorado's description of 21st century skills**

The 21st century skills are the synthesis of the essential abilities students must apply in our rapidly changing world. Today's students need a repertoire of knowledge and skills that are more diverse, complex, and integrated than any previous generation. Social studies is inherently demonstrated in each of Colorado 21st century skills, as follows:

**Critical Thinking and Reasoning** – Social studies is a discipline grounded in critical thinking and reasoning. Doing history, geography, civics and economics involves recognizing patterns and relationships across time and space. Social studies provide the structure that makes it possible to describe patterns that exist in nature and society.

**Information Literacy** – The disciplines of social studies equip students with tools and mental habits to organize and interpret a multitude of resources. A social studies student with information literacy skills can effectively analyze primary and secondary sources, detect bias, use learning tools, including technology, and clearly communicate thoughts using sound reasoning.

**Collaboration** – The content areas of social studies involve the give and take of ideas. In the course of understanding social studies, students offer ideas, strategies, solutions, justifications, and proofs for others to evaluate. In turn, the student interprets and evaluates the ideas, strategies, solutions, and justifications of others.

**Self-Direction** – Understanding social studies requires a productive disposition, curiosity and self-direction. This involves monitoring and assessing one's thinking and persisting to search for patterns, relationships, cause and effect, and an understanding of the events and people throughout time.

**Invention** – The social studies are a dynamic set of content area disciplines, ever expanding with new ideas and understandings. Invention is the key element as students make and test theories, create and use social studies tools, search for patterns and themes, and make connections among ideas, strategies and solutions.

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