

Academic Standards for Geography



Pennsylvania Department of Education

Academic Standards for Geography

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Academic Standards for Geography

XX. INTRODUCTION

This document includes Academic Standards for Geography that describe what students should know and be able to do in four areas:

- ◇ 7.1. Basic Geographic Literacy
- ◇ 7.2. The Physical Characteristics of Places and Regions
- ◇ 7.3. The Human Characteristics of Places and Regions
- ◇ 7.4. The Interactions Between People and Places

The Geography Standards describe what students should know and be able to do at four grade levels (third, sixth, ninth and twelfth). They reflect the increasingly complex and sophisticated understanding of geography that students are expected to achieve as they progress through school. Throughout the standards, all grade levels must address the local-to-global progression (scales). Basic concepts found in lower grade levels must be developed more fully at higher grade levels.

Geography is the science of space and place on Earth's surface. Its subject matter is the physical and human phenomena that make up the world's environments and places. These standards build on using geographic tools as a means for asking and answering geographic questions; setting information into a range of spatial contexts; recognizing places and regions as human concepts; understanding the physical processes that have shaped Earth's surface and the patterns resulting from those processes; identifying the relationships between people and environments; recognizing the characteristics and distribution of people and cultures on Earth's surface; focusing on the spatial patterns of settlements and their resulting political structures; and exploring the networks of economic interdependence and the importance of resources.

At each grade level, instructional content should be selected to support the development of geographic understanding. In the primary grade levels (1 - 3), the emphasis should be on identifying the basic characteristics of the world (answering the *what* question); at the intermediate grade levels (4 - 6), the emphasis should be on describing spatial patterns of phenomena (answering the *where and when* questions); at the middle grade levels (7 - 9), the emphasis should be on explaining spatial patterns of phenomena (answering the *how* question); and at high school grade levels (10 - 12), the emphasis should be on analyzing spatial patterns of phenomena (answering the *why* question). Although the emphasis may focus on specific questions, these questions may be encountered at any grade level.

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Geography is an integrative discipline that enables students to apply geography skills and knowledge to life situations at home, at work and in the community. Therefore, these standards should be cross-walked with those in Civics and Government, Economics and History to create an interdisciplinary view of the world. Topics and concepts in geography directly relate to standard statements in Environment and Ecology, Economics, Mathematics, Science and Technology and Civics and Government.

Teachers should employ the Five Fundamental Themes of Geography while proceeding through the Academic Standards for Geography. The relationship between the themes and the standards is clear. The standards describe what students should know and be able to do while the themes provide a clear conceptual basis for teachers and students to use in organizing their knowledge.

These are the Five Fundamental Themes of Geography:

Theme	Description
Location	The absolute and relative position of a place on Earth's surface
Place	How physical and human characteristics define and distinguish a place
Human-Environment Interactions	How humans modify and adapt to natural settings
Movement	How people, ideas and materials move between and among locations
Regions	How an area displays unity in terms of physical and human characteristics

The academic standards for Geography consist of four standard categories (designated as 7.1., 7.2., 7.3. and 7.4.). Each category has two to five standard statements (designated by a capital letter). Most standard statements have bulleted items known as standard descriptors. The standard descriptors are items within the document to illustrate and enhance the standard statement. The categories, statements, descriptors are regulations. The descriptors may be followed by an "e.g.". The "e.g.'s" are examples to clarify what type of information could be taught. These are suggestions and the choice of specific content is a local decision as is the method of instruction.

Geography along with Civics and Government, Economics, and History are identified as Social Studies in Chapter 4. This identification is consistent with citizenship education in Chapter 49 and Chapter 354. Based on these regulations, Social Studies/Citizenship programs should include the four sets of standards as an entity in developing a scope and sequence for curriculum and planned instruction.

A glossary is included to assist the reader in clarifying terminology contained in the standards.

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7.1. Basic Geographic Literacy			
7.1.3. GRADE 3	7.1.6. GRADE 6	7.1.9. GRADE 9	7.1.12. GRADE 12
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to . .</i>			
<p>A. Identify geographic tools and their uses.</p> <ul style="list-style-type: none"> • Characteristics and purposes of different geographic representations <ul style="list-style-type: none"> ➤ Maps and basic map elements ➤ Globes ➤ Graphs ➤ Diagrams ➤ Photographs • Geographic representations to display spatial information <ul style="list-style-type: none"> ➤ Sketch maps ➤ Thematic maps • Mental maps to describe the human and physical features of the local area 	<p>A. Describe geographic tools and their uses.</p> <ul style="list-style-type: none"> • Basis on which maps, graphs and diagrams are created <ul style="list-style-type: none"> ➤ Aerial and other photographs ➤ Reference works ➤ Field observations ➤ Surveys • Geographic representations to display spatial information <ul style="list-style-type: none"> ➤ Absolute location ➤ Relative location ➤ Flows (e.g., goods, people, traffic) ➤ Topography ➤ Historic events • Mental maps to organize an understanding of the human and physical features of Pennsylvania and the home county • Basic spatial elements for depicting the patterns of physical and human features <ul style="list-style-type: none"> ➤ Point, line, area, location, distance, scale ➤ Map grids ➤ Alpha-numeric system ➤ Cardinal and intermediate directions 	<p>A. Explain geographic tools and their uses.</p> <ul style="list-style-type: none"> • Development and use of geographic tools <ul style="list-style-type: none"> ➤ Geographic information systems [GIS] ➤ Population pyramids ➤ Cartograms ➤ Satellite-produced images ➤ Climate graphs ➤ Access to computer-based geographic data (e.g., Internet, CD-ROMs) • Construction of maps <ul style="list-style-type: none"> ➤ Projections ➤ Scale ➤ Symbol systems ➤ Level of generalization ➤ Types and sources of data • Geographic representations to track spatial patterns <ul style="list-style-type: none"> ➤ Weather ➤ Migration ➤ Environmental change (e.g., tropical forest reduction, sea-level changes) • Mental maps to organize and understand the human and physical features of the United States 	<p>A. Analyze data and issues from a spatial perspective using the appropriate geographic tools.</p> <ul style="list-style-type: none"> • Spatial patterns of human features that change over time (e.g., intervening opportunity, distance decay, central place theory, locational preference) • Physical patterns of physical features that change over time (e.g., climate change, erosion, ecological invasion and succession) • Human and physical features of the world through mental maps

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<p>B. Identify and locate places and regions.</p> <ul style="list-style-type: none"> • Physical features <ul style="list-style-type: none"> ➤ Continents and oceans ➤ Major landforms, rivers and lakes in North America ➤ Local community • Human features <ul style="list-style-type: none"> ➤ Countries (i.e., United States, Mexico, Canada) ➤ States (i.e., Pennsylvania, Delaware, Maryland, New Jersey, New York, Ohio, West Virginia) ➤ Cities (i.e., Philadelphia, Erie, Altoona, Pittsburgh, Scranton, Harrisburg, Johnstown, Allentown, Washington D.C., Baltimore, New York, Toronto, Cleveland) ➤ Local community • Regions as areas with unifying geographic characteristics <ul style="list-style-type: none"> ➤ Physical regions (e.g., landform regions, climate regions, river basins) ➤ Human regions (e.g., neighborhoods, cities, states, countries) 	<p>B. Describe and locate places and regions.</p> <ul style="list-style-type: none"> • Coordinate systems (e.g., latitude and longitude, time zones) • Physical features <ul style="list-style-type: none"> ➤ In the United States (e.g., Great Lakes, Rocky Mountains, Great Plains) ➤ In Pennsylvania (e.g., Coastal Plain, Piedmont, Appalachians) • Human features <ul style="list-style-type: none"> ➤ Countries (e.g., United Kingdom, Argentina, Egypt) ➤ Provinces (e.g., Ontario, Quebec, Nova Scotia) ➤ Major human regions (e.g., Mid Atlantic, New England, Southwest) ➤ States (e.g., California, Massachusetts, Florida) ➤ Major cities (e.g., London, Los Angeles, Tokyo) ➤ Counties (e.g., Lancaster, Lackawanna, Jefferson) ➤ Townships (e.g., Dickinson, Lower Mifflin, Southampton) • Ways in which different people view places and regions (e.g., places to visit or to avoid) • Community connections to other places <ul style="list-style-type: none"> ➤ Dependence and interdependence ➤ Access and movement 	<p>B. Explain and locate places and regions.</p> <ul style="list-style-type: none"> • How regions are created to interpret Earth's complexity (i.e., the differences among formal regions, functional regions, perceptual regions) • How characteristics contribute to regional changes (e.g., economic development, accessibility, demographic change) • How culture and experience influence perceptions of places and regions • How structures and alliances impact regions <ul style="list-style-type: none"> ➤ Development (e.g., First vs. Third World, North vs. South) ➤ Trade (e.g., NAFTA, the European Union) ➤ International treaties (e.g., NATO, OAS) • How regions are connected (e.g., watersheds and river systems, patterns of world trade, cultural ties, migration) 	<p>B. Analyze the location of places and regions.</p> <ul style="list-style-type: none"> • Changing regional characteristics (e.g., short- and long-term climate shifts; population growth or decline; political instability) • Criteria to define a region (e.g., the reshaping of south Florida resulting from changing migration patterns; the US-Mexico border changes as a function of NAFTA; metropolitan growth in the Philadelphia region) • Cultural change (e.g., influence on people's perceptions of places and regions)
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Basic Geography Literacy must include local-to-global progression (scales) for all students at all grade levels for the standard statements and their descriptors. Basic concepts introduced in lower grade levels must be developed more fully throughout higher grade levels. Portions of Basic Geography Literacy relate directly to the Mathematics Standards.

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7.2 The Physical Characteristics of Places and Regions			
7.2.3. GRADE 3	7.2.6. GRADE 6	7.2.9. GRADE 9	7.2.12. GRADE 12
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to. . .</i>			
<p>A. Identify the physical characteristics of places and regions.</p> <ul style="list-style-type: none"> • Physical properties <ul style="list-style-type: none"> ➤ Landforms (e.g., plains, hills, plateaus and mountains) ➤ Bodies of water (e.g., rivers, lakes, seas and oceans) ➤ Weather and climate ➤ Vegetation and animals • Earth's basic physical systems <ul style="list-style-type: none"> ➤ Lithosphere ➤ Hydrosphere ➤ Atmosphere ➤ Biosphere <p>B. Identify the basic physical processes that affect the physical characteristics of places and regions.</p> <ul style="list-style-type: none"> • Earth-sun relationships (i.e., seasons and length of daylight, weather and climate) • Extreme physical events (e.g., earthquakes, floods, hurricanes, tornadoes) 	<p>A. Describe the physical characteristics of places and regions.</p> <ul style="list-style-type: none"> • Components of Earth's physical systems (e.g., clouds, storms, relief and elevation [topography], tides, biomes, tectonic plates) • Comparison of the physical characteristics of different places and regions (e.g., soil, vegetation, climate, topography) • Climate types (e.g., marine west coast, humid continental, tropical wet and dry) <p>B. Describe the physical processes that shape patterns on Earth's surface.</p> <ul style="list-style-type: none"> • Earth-sun relationships (i.e., differences between equinoxes and solstices, reasons they occur and their relationship to latitude) • Climate influences (e.g., elevation, latitude, nearby ocean currents) 	<p>A. Explain the physical characteristics of places and regions including spatial patterns of Earth's physical systems.</p> <ul style="list-style-type: none"> • Climate regions • Landform regions <p>B. Explain the dynamics of the fundamental processes that underlie the operation of Earth's physical systems.</p> <ul style="list-style-type: none"> • Wind systems • Water cycle • Erosion/deposition cycle • Plate tectonics • Ocean currents • Natural hazards 	<p>A. Analyze the physical characteristics of places and regions including the interrelationships among the components of Earth's physical systems.</p> <ul style="list-style-type: none"> • Biomes and ecosystem regions • Watersheds and river basins • World patterns of biodiversity <p>B. Analyze the significance of physical processes in shaping the character of places and regions.</p> <ul style="list-style-type: none"> • Circulation of the oceans • Ecosystem processes • Atmospheric systems • Extreme natural events

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	<ul style="list-style-type: none">• Climate change, (e.g., global warming/cooling, desertification, glaciations)• Plate tectonics• Hydrologic cycle		
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The Physical Characteristics of Places and Regions must include local-to-global progression (scales) for all students at all grade levels for the standard statements and their descriptors. Basic concepts must be developed more fully throughout higher grade levels. Portions of Physical Characteristics of Places and Regions relate directly to Science and Technology and Environment and Ecology standards.

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7.3 The Human Characteristics of Places and Regions			
7.3.3. GRADE 3	7.3.6. GRADE 6	7.3.9. GRADE 9	7.3.12. GRADE 12
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to . . .</i>			
<p>A. Identify the human characteristics of places and regions by their population characteristics.</p> <ul style="list-style-type: none"> • The number and distribution of people in the local community • Human movement in the local community (e.g., mobility in daily life, migration) <p>B. Identify the human characteristics of places and regions by their cultural characteristics.</p> <ul style="list-style-type: none"> • Components of culture (e.g., language, belief systems and customs, social organizations, foods, ethnicity) 	<p>A. Describe the human characteristics of places and regions by their population characteristics.</p> <ul style="list-style-type: none"> • Spatial distribution, size, density and demographic characteristics of population at the county and state level. • Causes of human movement <ul style="list-style-type: none"> ➢ Mobility (e.g., shopping, commuting, recreation) ➢ Migration models (e.g., push/pull factors, barriers to migration) <p>B. Describe the human characteristics of places and regions by their cultural characteristics.</p> <ul style="list-style-type: none"> • Ethnicity of people at the county and state levels (e.g., customs, celebrations, languages, religions) 	<p>A. Explain the human characteristics of places and regions by their population characteristics.</p> <ul style="list-style-type: none"> • Spatial distribution, size, density and demographic characteristics of population at the state and National level • Demographic structure of a population (e.g., life expectancy, fertility rate, mortality rate, infant mortality rate, population growth rate, the demographic transition model) • Effects of different types and patterns of human movement <ul style="list-style-type: none"> ➢ Mobility (e.g., travel for business) ➢ Migration (e.g., rural to urban, short term vs. long term, critical distance) <p>B. Explain the human characteristics of places and regions by their cultural characteristics.</p> <ul style="list-style-type: none"> • Ethnicity of people at national levels (e.g., customs, celebrations, languages, religions) • Culture distribution (e.g., ethnic enclaves and neighborhoods) 	<p>A. Analyze the significance of human activity in shaping places and regions by their population characteristics:</p> <ul style="list-style-type: none"> • Spatial distribution, size, density and demographic characteristics of population at the international level • Demographic trends and their impacts on patterns of population distribution (e.g., carrying capacity, changes in fertility, changes in immigration policy, the mobility transition model) • Impact of movement on human systems (e.g., refugees, guest workers, illegal aliens) <p>B. Analyze the significance of human activity in shaping places and regions by their cultural characteristics.</p> <ul style="list-style-type: none"> • Cultural conflicts (e.g., over language (Canada), over political power (Spain), over economic opportunities (Mexico))

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<ul style="list-style-type: none"> • Ethnicity of people in the local community (e.g., customs, celebrations, languages, religions) <p>C. Identify the human characteristics of places and regions by their settlement characteristics.</p> <ul style="list-style-type: none"> • Types of settlements (e.g., villages, towns, suburbs, cities, metropolitan areas) • Factors that affect where people settle (e.g., water, resources, transportation) <p>D. Identify the human characteristics of places and regions by their economic activities.</p> <ul style="list-style-type: none"> • Location factors in the spatial distribution of economic activities (e.g., market, transportation, workers, materials) <ul style="list-style-type: none"> ➤ Producers of consumer products and services (e.g., bread, pizza, television, shopping malls) 	<ul style="list-style-type: none"> • Spatial arrangement of cultures creates distinctive landscapes (e.g., cultural regions based on languages, customs, religion, building styles as in the Pennsylvania German region) <p>C. Describe the human characteristics of places and regions by their settlement characteristics.</p> <ul style="list-style-type: none"> • Current and past settlement patterns in the local area • Factors that affect the growth and decline of settlements (e.g., immigration, transportation development, depletion of natural resources, site and situation) <p>D. Describe the human characteristics of places and regions by their economic activities.</p> <ul style="list-style-type: none"> • Spatial distribution of economic activities in the local area (e.g., patterns of agriculture, forestry, mining, retailing, manufacturing, services) • Factors that influence the location and spatial distribution of economic activities (e.g., market size for different types of 	<ul style="list-style-type: none"> • Cultural diffusion (e.g., acculturation and assimilation, cultural revivals of language) <p>C. Explain the human characteristics of places and regions by their settlement characteristics.</p> <ul style="list-style-type: none"> • Current and past settlement patterns in Pennsylvania and the United States • Forces that have re-shaped modern settlement patterns (e.g., central city decline, suburbanization, the development of transport systems) • Internal structure of cities (e.g., manufacturing zones, inner and outer suburbs, the location of infrastructure) <p>D. Explain the human characteristics of places and regions by their economic activities.</p> <ul style="list-style-type: none"> • Spatial distribution of economic activities in Pennsylvania and the United States (e.g., patterns of agriculture, forestry, mining, retailing, manufacturing, services) • Factors that shape spatial patterns of economic activity both Nationally and internationally (e.g., comparative advantage in 	<ul style="list-style-type: none"> • Forces for cultural convergence (e.g., the diffusion of foods, fashions, religions, language) <p>C. Analyze the significance of human activity in shaping places and regions by their settlement characteristics.</p> <ul style="list-style-type: none"> • Description of current and past settlement patterns at the international scale (e.g., global cities) • Use of models of the internal structure of cities (e.g., concentric zone, sector, multiple nuclei) • Forces that have reshaped settlement patterns (e.g., commuter railroads, urban freeways, the development of <u>megalopolis</u> and edge cities) <p>D. Analyze the significance of human activity in shaping places and regions by their economic characteristics.</p> <ul style="list-style-type: none"> • Changes in spatial distribution of economic activities at the global scale (e.g., patterns of agriculture, forestry, mining, retailing, manufacturing, services) • Forces that are reshaping business
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<ul style="list-style-type: none"> ➤ Products of farms and factories at the local and regional level (e.g., mushrooms, milk, snack foods, furniture) • Spatial distribution of resources <ul style="list-style-type: none"> ➤ Non-renewable resources ➤ Renewable resources ➤ Flow resources (e.g., water power, wind power) <p>E. Identify the human characteristics of places and regions by their political activities.</p> <ul style="list-style-type: none"> • Type of political units (e.g., townships, boroughs, towns, cities, counties, states, countries (nation state)) • Political units in the local area 	<p>business, accessibility, modes of transportation used to move people, goods and materials)</p> <ul style="list-style-type: none"> • Spatial distribution of resources and their relationship to population distribution <ul style="list-style-type: none"> ➤ Historical settlement patterns and natural resource use (e.g., waterpower sites along the Fall Line) ➤ Natural resource-based industries (e.g., agriculture, mining, fishing, forestry) <p>E. Describe the human characteristics of places and regions by their political activities.</p> <ul style="list-style-type: none"> • Spatial pattern of political units in Pennsylvania • Functions of political units (e.g., counties, municipalities, townships, school districts, PA General Assembly districts (House and Senate), U.S. Congressional districts, states) 	<p>location of economic activities; changes in resource trade; disruption of trade flows)</p> <ul style="list-style-type: none"> • Technological changes that affect the definitions of, access to, and use of natural resources (e.g., the role of exploration, extraction, use and depletion of resources) <p>E. Explain the human characteristics of places and regions by their political activities.</p> <ul style="list-style-type: none"> • Spatial pattern of political units in the United States • Geographic factors that affect decisions made in the United States (e.g., territorial expansion, boundary delineation, allocation of natural resources) • Political and public policies that affect geography (e.g., open space, urban development) 	<p>(e.g., the information economy, business globalization, the development of off-shore activities)</p> <ul style="list-style-type: none"> • Effects of changes and movements in factors of production (e.g., resources, labor, capital) <p>E. Analyze the significance of human activity in shaping places and regions by their political characteristics:</p> <ul style="list-style-type: none"> • Spatial pattern of political units in the global system • Role of new political alliances on the international level (e.g., multinational organizations, worker’s unions, United Nations’ organizations) • Impact of political conflicts (e.g., secession, fragmentation, insurgencies, invasions)
<p>The Human Characteristics of Places and Regions must include local-to-global progression (scales) for all students at all grade levels for the standard statements and their descriptors. Basic concepts found in lower grade levels must be developed more fully throughout higher grade levels. Portions of Human Characteristics of Places and Regions relate directly to the Civics and Government and Economics Standards.</p>			

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7.4 The Interactions Between People and Places			
7.4.3. GRADE 3	7.4.6. GRADE 6	7.4.9. GRADE 9	7.4.12. GRADE 12
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to...</i>			
<p>A. Identify the impacts of physical systems on people.</p> <ul style="list-style-type: none"> • How people depend on, adjust to and modify physical systems on a local scale (e.g., soil quality and agriculture, snowfall and daily activities, drought and water use) • Ways in which natural hazards affect human activities (e.g., storms, lightning, flooding) <p>B. Identify the impacts of people on physical systems.</p> <ul style="list-style-type: none"> • Effects of energy use (e.g., water quality, air quality, change in natural vegetation) • Ways humans change local ecosystems (e.g., land use, dams and canals on waterways, reduction and extinction of species) 	<p>A. Describe the impacts of physical systems on people.</p> <ul style="list-style-type: none"> • How people depend on, adjust to and modify physical systems on a regional scale (e.g., coastal industries, development of coastal communities, flood control) • Ways in which people adjust to life in hazard-prone areas (e.g., California and earthquakes, Florida and hurricanes, Oklahoma and tornadoes) <p>B. Describe the impacts of people on physical systems.</p> <ul style="list-style-type: none"> • Changing spatial patterns on Earth's surface that result from human activities (e.g., lake desiccation as in the Aral Sea, construction of dikes, dams and storm surge barriers in the Netherlands, designation of state parks and forests throughout Pennsylvania) 	<p>A. Explain the impacts of physical systems on people.</p> <ul style="list-style-type: none"> • How people depend on, adjust to and modify physical systems on a National scale (e.g., soil conservation programs, projects of The Corps of Engineers) • Ways in which people in hazard-prone areas adjust their ways of life (e.g., building design in earthquake areas, dry-farming techniques in drought-prone areas) <p>B. Explain the impacts of people on physical systems.</p> <ul style="list-style-type: none"> • Forces by which people modify the physical environment (e.g., increasing population; new agricultural techniques; industrial processes and pollution) 	<p>A. Analyze the impacts of physical systems on people.</p> <ul style="list-style-type: none"> • How people depend on, adjust to and modify physical systems on international scales (e.g., resource development of oil, coal, timber) • Ways in which people modify ways of life to accommodate different environmental contexts (e.g., building in permafrost areas; the role of air-conditioning in the United States South and Southwest; the development of enclosed spaces for movement in cold climates) <p>B. Analyze the impacts of people on physical systems.</p> <ul style="list-style-type: none"> • How people develop international agreements to manage environmental issues (e.g., Rio de Janeiro Agreement, the Law of the Sea, the Antarctica Treaty) • How local and regional processes can have global effects (e.g., wind and hydroelectric power transmitted across regions,

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	<ul style="list-style-type: none"> • Ways humans adjust their impact on the habitat (e.g., Endangered Species Act, replacement of wetlands, logging and replanting trees) 	<ul style="list-style-type: none"> • Spatial effects of activities in one region on another region (e.g., scrubbers on power plants to clean air, transportation systems such as Trans-Siberian Railroad, potential effects of fallout from nuclear power plant accidents) 	<p>transmitted across regions, water use and irrigation for crop production)</p> <ul style="list-style-type: none"> • Sustainability of resources (e.g., reforestation, conservation) • World patterns of resource distribution and utilization (e.g., oil trade, regional electrical grids)
<p>The Interactions Between People and Places must include local to global scales for all students at all grade levels for the standard statements and their descriptors. Basic concepts found in lower grade levels must be developed more fully throughout higher grade levels.</p>			

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XXI. GLOSSARY

Absolute location:	The position of a point on Earth's surface that can usually be described by latitude and longitude. Another example of absolute location would be the use of a nine digit zip code and street address.
Acculturation:	The process of adopting the traits of a cultural group.
Assimilation:	The acceptance, by one culture group or community, of cultural traits associated with another.
Atmosphere:	The body of gases, aerosols and other materials that surrounds Earth and is held close by gravity. It extends about twelve miles from Earth's surface.
Barriers to migration:	Factors that keep people from moving (e.g., lack of information about potential destination, lack of funds to cover the costs of moving, regulations that control migration).
Basic map elements:	Materials included on geographic representations. These include title, directions, date of map, mapmaker's name, a legend and scale. Often a geographic grid, the source of information and sometimes an index of places on the map are also included.
Biomes:	A community of living organisms of a single major ecological region.
Biosphere:	The domain of Earth that includes all plant and animal life forms.
Boundary:	The limit or extent within which a system exists or functions, including a social group, a state or physical features.
Capital:	One of the factors of production of goods and services. Capital can be goods (e.g., factories and equipment, highways, information, communications systems) and/or funds (investment and working capital) used to increase production and wealth. Other factors are land, water and labor.

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Cardinal directions:	The four main points of the compass; north, east, south and west.
Carrying capacity:	Maximum population that an area can support over time depending upon environmental conditions, human interventions and interdependence.
Central Place Theory:	The conceptual framework that explains the size, spacing and distribution of settlements and their economic relationships with their market areas.
Climate:	Long-term patterns and trends in weather elements and atmospheric conditions.
Climate graph (climagraph):	A diagram that combines average monthly temperature and precipitation data for a particular place.
Comparative advantage:	The specialization by a given area in the production of one or a few commodities for which it has a particular edge (e.g., labor quality, resources availability, production costs).
Concentric Zone Model:	A framework that proposes that urban functions and the associated land uses are arranged in rings that grow outward from a central area. One of three models developed to explain how cities and metropolitan areas are arranged internally. The other models are the Sector and the Multiple Nuclei.
Country:	Unit of political space often referred to as a state or nation-state.
Culture:	Learned behavior of people, which includes their belief systems and languages, their social relationships, their institutions and organizations and their material goods—food, clothing, buildings, tools and machines.
Cultural diffusion:	The spread of cultural elements from one culture to another.
Cultural landscape:	The human imprint on the physical environment; the humanized image as created or modified by people.
Demographic change:	Variation in population size, composition, rates of growth, density, fertility and mortality rates and patterns of migration.

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Density:	The population or number of objects per unit area (e.g., per square kilometer or mile).
Desertification:	The spread of desert conditions in arid and semiarid regions resulting from a combination of climatic changes and increasing human pressures (e.g., overgrazing, removal of vegetation, cultivation of marginal land).
Desiccation:	The reduction in water level (drying out) of an inland water body.
Developed country:	An area of the world that is technologically advanced, highly urbanized and wealthy and has generally evolved through both economic and demographic transitions.
Diffusion:	The spread of people, ideas, technology and products among places.
Distance decay:	The tendency for the acceptance of new ideas and technologies to decrease with distance from their source.
Earthquake:	Vibrations and shock waves caused by the sudden movement of tectonic plates along fracture zones, called faults, in Earth's crust.
Ecosystem (ecological system):	A network formed by the interaction of all living organisms (plants, animals, humans) with each other and with the physical and chemical factors of the environment in which they live.
Elevation:	Height of a point or place above sea level (e.g., Mount Everest has an elevation of 29,028 feet above sea level).
Enclave:	A country, territorial or culturally distinct unit enclosed within a larger country or community.
Environment:	Everything in and on Earth's surface and its atmosphere within which organisms, communities or objects exist.
Equilibrium:	The point in the operation of a system when driving forces and resisting forces are in balance.

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Equinoxes:	The two days during the calendar year (usually September 23 and March 21) when all latitudes have twelve hours of both daylight and darkness and the sun is directly overhead at the Equator.
Erosional processes:	The removal and transportation of weathered (loose) rock material by water, wind, waves and glaciers. Deposition is the end result of erosion and occurs when transported material is dropped.
Fall line:	A linear connection joining the waterfalls on numerous rivers and streams that marks the point where each river and stream descends from the upland and the limit of the navigability of each river (e.g., the narrow boundary zone between the coastal plain and the Piedmont in the Eastern United States where there are falls and rapids on streams and rivers as they drop from the more resistant rocks of the Piedmont onto the softer rocks of the coastal plain).
Fertility rate:	A measure of the number of children a woman will have during her child-bearing years (15 to 49 years of age) in comparison to the adult female population in a particular place.
Formal region:	An area defined by the uniformity or homogeneity of certain characteristics (e.g., precipitation, landforms, subculture).
Functional region:	An area united by a strong core (node) or center of human population and activity (e.g., banking linkages between large cities and smaller cities and towns).
Geographic Information System:	A geographic database that contains information about the distribution of physical and human characteristics of places. In order to test hypotheses, maps of one characteristic or a combination can be produced from the database to analyze the data relationships.
Geographic scale:	The size of Earth's surface being studied. Study areas vary from local to regional to global. Scale also refers to the relationship between the size of space on a map and the size of that space on Earth's surface. Maps are referred to as large scale if they are of smaller (local) areas and small scale if they represent much or all of the Earth's surface. Map scale is expressed as a bar graph or representative fraction.
Global warming:	The theory that Earth's atmosphere is gradually warming due to the buildup of certain gases, including carbon dioxide and methane, which are released by human activities. The increased levels of these gases cause added heat energy from Earth to be absorbed by the atmosphere instead of being lost in space.

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Globe:	A scale model of Earth that correctly represents area, relative size and shape of physical features, distance between points and true compass direction.
Grid:	A pattern of lines on a chart or map, such as those representing latitude and longitude, which helps determine absolute location and assists in the analysis of distribution patterns.
Human features:	Tangible and intangible ideas associated with the culture, society and economy of places or areas. These include the spatial arrangement of land uses including transportation, the design of buildings and the nature and timing of activities that people conduct in these spaces.
Hydroelectric power:	Electrical energy generated by the force of falling water which rotates turbines housed in power plants in dams on rivers.
Hydrosphere:	The water realm of Earth which includes water contained in the oceans, lakes, rivers, ground, glaciers and water vapor in the atmosphere.
Infant mortality rate:	The annual number of deaths among infants under one year of age for every 1,000 live births. It usually provides an indication of health care levels. The United States, for example, has a 1994 rate of 8.3 infant deaths per 1,000 live births while Angola has a rate of 137 infant deaths per 1,000 births.
Interdependence:	Ideas, goods and services in one area affect decisions and events in other areas reducing self-sufficiency.
Intermediate directions:	The points of the compass that fall between north and east, north and west, south and east, south and west (e.g., NE, NW, SE, SW).
Intervening opportunity:	An alternate area that is a source of a product or service or a destination in the case of migration.
Lake desiccation:	The reduction in water level (drying out) of an inland water body.

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Land use:	The range of uses of Earth's surface made by humans. Uses are classified as urban, rural, agricultural, forested, etc. with more specific sub-classifications useful for specific purposes (e.g., low-density residential, light industrial, nursery crops).
Landform:	The shape, form or nature of a specific physical feature of Earth's surface (e.g., plain, hill, plateau, mountain).
Life expectancy:	The average number of remaining years a person can expect to live under current mortality levels in a society. Life expectancy at birth is the most common use of this measure.
Lithosphere:	The uppermost portion of the solid Earth including soil, land and geologic formations.
Location:	The position of a point on Earth's surface expressed by means of a grid (absolute) or in relation (relative) to the position of other places.
Map:	A graphic representation of a portion of Earth that is usually drawn to scale on a flat surface.
Materials:	Raw or processed substances that are used in manufacturing (secondary economic activities). Most substances used in factories are already manufactured to some degree and come from other factories rather than from sources of raw materials.
Megalopolis:	The intermingling of two or more large metropolitan areas into a continuous or almost continuous built-up urban complex; sometimes referred to as a conurbation.
Mental map:	A geographic representation which conveys the cognitive image a person has of an area, including knowledge of features and spatial relationships as well as the individual's perceptions and attitudes regarding the place; also known as a cognitive map.
Metropolitan area:	The Federal Office of Management and Budget's designation for the functional area surrounding and including a central city; has a minimum population of 50,000; is contained in the same county as the

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central city; and includes adjacent counties having at least 15 % of their residents working in the central city's county.

- Migration:** The act or process of people moving from one place to another with the intent of staying at the destination permanently or for a relatively long period of time.
- Multinational organizations:** An association of nations aligned around a common economic or political cause (e.g., the Organization of Petroleum Exporting Countries, the Organization of American States).
- Multiple Nuclei Model:** A representation of urban structure based on the idea that the functional areas (land use) of cities develop around various points rather than just one in the Central Business District.
- Municipality:** A political unit incorporated for local self-government (e.g., Pennsylvania's boroughs, townships).
- NAFTA:** North American Free Trade Agreement. NAFTA is an accord to establish clear and mutually advantageous rules governing commerce among Canada, Mexico and the United States.
- NATO:** North Atlantic Treaty Organization. An international transatlantic partnership consisting of various European states, the United States and Canada, which was designed through cooperation, consultation and collective defense to maintain peace and promote stability throughout Europe.
- Nation:** A cultural concept for a group of people bound together by a strong sense of shared values and cultural characteristics including language, religion and common history.
- Natural hazard:** An event in the physical environment, such as a hurricane or earthquake, that is destructive to human life and property.
- Natural resource:** An element of the physical environment that people value and use to meet a need for fuel, food, industrial product or something else of value.
- Nonrenewable resource:** A finite element that cannot be replaced once it is used (e.g., petroleum, minerals).

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Ocean currents:	The regular and consistent horizontal flow of water in the oceans, usually in response to persistent patterns of circulation in the atmosphere.
OAS:	Organization of American States. An international governmental organization formed by the nation-states of North America and South America for security and the protection of mutual interests.
OPEC:	The Organization of Petroleum Exporting Countries; international cartel of thirteen nations designed to promote collective pricing of petroleum, unified marketing policies and regulation of petroleum extraction.
Perceptual region:	Ideas that people have about the character of areas based on impressions from a variety of sources of information including other individuals and media. Mental maps can be used to access these ideas to find out what people think about particular areas.
Physical feature:	An aspect of a place or area that derives from the physical environment.
Physical process:	A course or method of operation that produces, maintains or alters Earth's physical system (e.g., glacial eroding, depositing landforms).
Place:	An area with distinctive human and physical characteristics; these characteristics give it meaning and character and distinguish it from other areas.
Plate tectonics:	The theory that Earth's surface is composed of rigid slabs or plates (see tectonic plates). The divergence, convergence and slipping side-by-side of the different plates is responsible for present-day configurations of continents, ocean basins and major mountain ranges and valley systems.
Pollution:	The direct or indirect process resulting from human action by which any part of the environment is made potentially or actually unhealthy, unsafe or hazardous to the welfare of the organisms which live in it.
Population density:	The number of individuals occupying an area derived from dividing the number of people by the area they occupy (e.g., 2,000 people divided by ten square miles = 200 people per square mile).
Population pyramid:	A bar graph showing the distribution by gender and age of a country's population.

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Primary economic activity:	The production of naturally existing or culturally improved resources (i.e., agriculture, ranching, forestry, fishing, extraction of minerals and ores).
Pull factors:	In migration theory, the social, political, economic and environmental attractions of new areas that draw people away from their previous location.
Push factors:	In migration theory, the social, political, economic and environmental forces that drive people from their previous location.
Region:	An area with one or more common characteristics or features that give it a measure of consistency and make it different from surrounding areas.
Relative location:	The site of a place or region in relation to other places or regions (e.g., northwest, downstream).
Renewable resource:	A substance that can be regenerated if used carefully (e.g., fish, timber).
Resource:	An aspect of the physical environment that people value and use to meet a need for fuel, food, industrial product or something else of value.
Satellite image:	A representation produced by a variety of sensors (e.g., radar, microwave detectors, scanners) that measure and record electromagnetic radiation. The collected data are turned into digital form for transmission to ground receiving stations. The data can be reconverted into imagery in a form resembling a photograph.
Scale:	On maps the relationship or ratio between a linear measurement on a map and the corresponding distance on Earth's surface. For example, the scale 1:1,000,000 means one unit (inch or centimeter) on the map represents 1,000,000 of the same units on Earth's surface. Also refers to the size of places or regions being studied.
Sector Model:	A theory of urban structure that recognizes the impact of transportation on land prices within the city and the resulting tendency for functional areas to be organized into sectors.

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Secondary economic activity:	Processing of raw and manufactured materials into products with added value.
Settlement pattern:	The spatial distribution and arrangement of human habitations (e.g., rural, urban).
Site:	The specific location where something may be found including its physical setting (e.g., on a floodplain).
Situation:	The general location of something in relation to other places or features of a larger region (e.g., in the center of a group of cities).
Soil:	Unconsolidated material found at the surface of Earth, which is divided into layers (or horizons) characterized by the accumulation or loss of organic and inorganic compounds. Loam types and depths vary greatly over Earth's surface and are very much influenced by climate, organisms, rock type, local relief, time and human activity.
Spatial:	Pertains to space on Earth's surface.
Spatial distribution:	The distribution of physical and human elements on Earth's surface.
Spatial organization:	The arrangement on Earth's surface of physical and human elements.
Suburbanization:	The shift in population from living in higher density urban areas to lower density developments on the edge of cities.
System:	A collection of entities that are linked and interrelated (e.g., the hydrologic cycle, cities, transportation modes).
Technology:	Application of knowledge to meet the goals, goods and services needed and desired by people.
Tectonic plates:	Sections of Earth's rigid crust that move as distinct units on a plastic-like ledge (mantle) on which they rest. As many as twenty different plates have been identified, but only seven are considered to be major (e.g., Eurasian Plate, South American Plate).

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- Thematic map:** A geographic representation of a specific spatial distribution, theme or topic (e.g., population density, cattle production, climates of the world).
- Time zone:** A division of Earth, usually 15 degrees longitude, within which the time at the central meridian of the division represents the whole division.
- Topography:** The shape of Earth's surface.
- Water cycle:** The continuous circulation of water from the oceans, through the air, to the land and back to the sea. Water evaporates from oceans, lakes, rivers and the land surfaces and transpires from vegetation. It condenses into clouds in the atmosphere that may result in precipitation returning water to the land. Water then seeps into the soil or flows out to sea completing the circulation. Also known as Hydrologic Cycle.