

TOPIC: SPATIAL THINKING AND SKILLS**Content Statement**

- 1. Properties and functions of geographic representations (e.g., maps, globes, graphs, diagrams, Internet-based mapping applications, geographic information systems, global positioning systems, remote sensing, and geographic visualizations) affect how they can be used to represent, analyze, and interpret geographic patterns and processes.**

CONTENT ELABORATION

Geographers have a variety of tools to represent spatial data. Spatial data is information that identifies the geographic location of features and boundaries on Earth, either natural or manmade. For instance, a world map is a graphic representation of Earth's surface drawn to scale. A map's projection, however, may distort the appearance of the surface portrayed. A globe is a three-dimensional representation of the planet, but is not easily portable.

Geographic information systems (GIS) are databases that permit various kinds of maps to be created combining selected elements of information. Global positioning system (GPS) is a network of orbiting satellites that allow receivers on Earth to locate their exact position using latitude and longitude.

Remote sensing is information gathered about a surface from a distance (e.g., aerial photography, satellite images). Geographic visualizations range from printed maps with spatial data (e.g., cartographic maps) to interactive computer tools (e.g., three-dimensional models).

EXPECTATIONS FOR LEARNING

Explain the uses and limitations of various kinds of spatial data to represent, analyze, and interpret geographic patterns and processes.

Content Statement

- 2. Geographic representations and geospatial technologies are used to investigate, analyze, and communicate the results of geographic problem solving.**

CONTENT ELABORATION

Geographic representations and geospatial technologies include maps, globes, graphs, diagrams, Internet-based mapping applications, geographic information systems (GIS), global positioning systems (GPS), remote sensing, and geographic visualizations. Geospatial refers to information that identifies the particular location of features on Earth's surface, such as oceans and mountains.

Different ways of representing spatial data can be used in geographic problem solving. For example, census data can be portrayed visually and used to help determine geographic patterns within a region or area. These patterns can then be used to help locate appropriate routes for road construction or site locations for providing services.

Remote sensing is information gathered about a surface from a distance (e.g., aerial photography, satellite images). Geographic visualizations range from printed maps with spatial data (e.g., cartographic maps) to interactive.

EXPECTATIONS FOR LEARNING

Identify uses for specific geographic representations and geospatial technologies.

Use appropriate geographic representations and geospatial technologies to investigate, analyze, and communicate information related to solving a geographic problem.

TOPIC: ENVIRONMENT AND SOCIETY**Content Statement**

- 3. Human modifications of the physical environment in one place often lead to changes in other places (e.g., construction of a dam provides downstream flood control, construction of a city by-pass reduces commercial activity in the city center, implementation of dry farming techniques in a region leads to new transportation links and hubs).**

CONTENT ELABORATION

The interaction of humans with the physical environment in one place can lead to expected (intended) as well as unexpected (unintended) consequences in other places due to the systemic and interdependent nature of the physical environment.

For example, the construction of the St. Lawrence Seaway had the intended consequence of facilitating transportation of goods by oceangoing vessels into the heartland of North America. It also had an unintended consequence of enabling invasive species of fish and mussels to penetrate throughout the Great Lakes drainage basin.

The use of strip mines had the expected effect of increasing ore extraction at lower cost, but also had an unintended effect of producing toxic runoff in neighboring lakes and streams.

EXPECTATIONS FOR LEARNING

Citing examples, explain how a human modification of the physical environment in one place can produce intended and unintended change in another place.

Content Statement

- 4. Human societies use a variety of strategies to adapt to the opportunities and constraints presented by the physical environment (e.g., farming in flood plains and terraced farming, building hydroelectric plants by waterfalls and constructing hydroelectric dams, using solar panels as a heat source and using extra insulation to retain heat).**

CONTENT ELABORATION

Societies can use their physical environments provide to address societal wants (e.g., drilling for petroleum in available reserves) or to develop alternative strategies to overcome limitations presented by their physical environments (e.g., trading goods to obtain petroleum if petroleum reserves are unavailable).

Different societies use unique approaches when addressing the opportunities and constraints posed by their physical environments. For example, Iceland and China have sought to avoid burning coal for the production of power. While Iceland has turned to geothermal sources of power, China has invested in a series of dams, including the Three Gorges Dam.

EXPECTATIONS FOR LEARNING

Compare how different societies adapt to the opportunities or constraints presented by their physical environments when attempting to address a common task.

TOPIC: ENVIRONMENT AND SOCIETY**Content Statement**

- 5. Physical processes influence the formation and distribution of renewable, nonrenewable, and flow resources (e.g., tectonic activity plays a role in the formation and location of fossil fuels, erosion plays a role in the formation of sedimentary rocks, rainfall patterns affect regional drainage patterns).**

CONTENT ELABORATION

Physical processes include internal forces (e.g., folding, faulting, earthquakes, tsunamis, volcanic activity) as well as external forces (e.g., mechanical weathering, chemical weathering, erosion, Earth's tilt and rotation).

Resources are substances drawn from the physical environment that are used to meet human wants (e.g., food, fuel, things of value).

Renewable resources can be replenished if not overused (e.g., trees, fruits).

Nonrenewable resources cannot be replaced once used (e.g., petroleum, coal).

Flow resources must be used as they occur or they are lost (e.g., wind, sunlight).

EXPECTATIONS FOR LEARNING

Explain how physical processes influence the formation and distribution of renewable, nonrenewable, and flow resources.

Content Statement

- 6. There are costs and benefits of using renewable, nonrenewable, and flow resources (e.g., availability, sustainability, environmental impact, expense).**

CONTENT ELABORATION

Resource use can be examined in terms of the costs and benefits involved. For instance, clear-cutting of forests:

- is a less costly method of harvesting timber resources than selective cutting (expense);
- provides significant amounts of timber in a shorter amount of time than selective cutting (availability);
- requires immediate replanting to restore the forest (sustainability) and prevent excessive erosion (environmental impact); and
- moves the location of animal habitats in some instances (environmental impact).

Selective cutting of forests:

- is costlier than clear-cutting (expense);
- takes more time to produce equivalent amounts of timber as clear-cutting (availability);
- does not destroy whole forests (sustainability); and
- reduces the overall quality of the forest in some instances by removing only the best trees and leaving behind poorer-quality trees to serve as a seed source for forest regeneration (environmental impact).

EXPECTATIONS FOR LEARNING

Evaluate the relative costs and benefits of using a selected resource.

TOPIC: ENVIRONMENT AND SOCIETY**Content Statement**

- 7. Human interaction with the environment is affected by cultural characteristics (e.g., plowing with oxen or with tractors, development of water resources for industry or recreation, resource conservation or development).**

CONTENT ELABORATION

Culture consists of the systemic beliefs, values, institutions and traditions that a society passes on to subsequent generations. Culture also includes attributes of a society, such as language, arts, literature, technologies and material goods. In short, it is a way of life of a society or group of people. Cultural characteristics are those features or traits that help distinguish one culture from another.

How societies interact with their physical environments is partly a result of their cultural characteristics and their technological resources.

For example, veneration of cattle by Hindus in India precludes the use of beef as a food source, whereas the lack of strictures on the consumption of beef by most religions in the United States results in cattle serving as a major food source.

The use of slash-and-burn techniques to clear fields is a long-standing practice in the Amazon River basin. It necessitates moving to new fields periodically due to the depletion of soil nutrients. The use of soil-conserving techniques (e.g., crop rotation) allows farmland in the American Midwest to be productive year after year.

Religious beliefs and farming techniques are cultural characteristics that help determine how humans interact with the environment. Hunting with bows and arrows or hunting with rifles reflects the influence of a society's technological resources on how humans interact with the environment.

EXPECTATIONS FOR LEARNING

Explain and provide examples of how cultural characteristics and technological resources influence human interaction with the environment.

TOPIC: MOVEMENT**Content Statement**

- 8. Physical, cultural, economic, and political factors contribute to human migrations (e.g., drought, religious conflicts, job opportunities, immigration laws).**

CONTENT ELABORATION

Human migration is the process of people moving from one place to another with the intention of settling in the new location for an extended period of time. Human migration can be characterized as emigration, movement relative to the point of departure, and immigration, movement relative to the destination.

A variety of factors lead to migrations of people. Pull factors are those things that attract people to a particular location (e.g., favorable climate, access to quality education system, low cost of living, civil liberties). Push factors are those things that drive people away from a location (e.g., drought, ethnic persecution, extreme poverty, war, crackdown on political dissent).

EXPECTATIONS FOR LEARNING

Explain how pull and push factors influence human migrations.

TOPIC: MOVEMENT**Content Statement**

- 9. Human migrations impact physical and human systems (e.g., stress on food supplies in refugee camps, removal of natural obstacles to movement, harvest productivity and migrant labor, calls for an official language in countries with high immigration, reduction in city tax revenues due to urban emigration).**

CONTENT ELABORATION

As migrations occur, there are impacts on physical and human systems. For instance, migrations associated with suburbanization can result in reduced animal habitats where suburbs are built. They also can alter traffic patterns on roadways connecting the suburbs to places of work and central cities requiring new traffic engineering studies.

EXPECTATIONS FOR LEARNING

Analyze the impacts of migration on physical and human systems, using geographic representations of particular places at different points in time.

Content Statement

- 10. Activities and patterns of trade and communication create interdependence among countries in different regions (e.g., seed corn grown in Iowa and planted in South America, high-definition televisions manufactured in Japan and viewed in the United States, news outlets from many countries available around the world via the Internet, instant access to data affecting stock markets in different countries).**

CONTENT ELABORATION

Increasingly, people around the world function in more complex economic and communication networks that foster interdependence. These networks provide access to resources that are unevenly distributed around the world. The networks promote the use of goods, services and information by encouraging their exchange. For example, modern phone communications allow Germans who purchase American computer systems with components produced in Japan and receive service advice from technicians in India.

Interruptions to economic and communication networks can result in disruptions to activities of people dependent upon the goods, services and information from other parts of the world.

EXPECTATIONS FOR LEARNING

Cite an example of a network global interdependence resulting from trade or communication involving at least three different countries.

Explain how a disruption to that network in one country could affect the other two countries.

TOPIC: REGION**Content Statement**

11. Criteria are used to organize regions and as the criteria change, the identified regions change (e.g., types of economic activities, ethnic groups, natural vegetation).

CONTENT ELABORATION

Regions are spatial concepts with boundaries and characteristics determined by the application of sets of specific criteria. These regions help observers organize the complexities of the Earth's surface based on physical and human characteristics.

There are three basic types of regions:

- Formal – a region characterized by a common human property (e.g., shared language, shared political identity) or by a common physical property (e.g., climate, vegetation);
- Functional – a region organized around a focal point and linked to surrounding areas via transportation systems, communication systems or economic functionalities (e.g., Antwerp, Belgium is a focal point for diamond trading, Tokyo, Japan is a focal point for stock trading); and
- Perceptual – a region based upon people's shared identifications and attitudes about an area (e.g., the Bible Belt, New England).

The same area can be categorized as part of multiple regions and regional types depending on which set of criteria are applied. For example, Cleveland can be viewed as part of the Great Lakes Region (a formal region based upon drainage patterns), as a center for financial and health care sectors (a functional region based on economic activities) and as part of the Rust Belt (a perceptual region based on the decline of manufacturing industries related to iron and steel from Pennsylvania through the Midwest).

EXPECTATIONS FOR LEARNING

Examine select regions to categorize the types of regions and determine the criteria used to determine each region.

Content Statement

12. The characteristics of regions change over time and there are consequences related to those changes (e.g., industrial belt to rust belt, pristine locations to tourist attractions, colony to independent state).

CONTENT ELABORATION

Regions change over time. One example of a changing formal region is the shrinking of the Amazon rainforest due to deforestation. An example of a changing perceptual region would be southern Florida, once primarily an agricultural region, shifting to a region known primarily as a retirement haven.

As regions change, there are often consequences associated with those changes.

An example is the recovery of vegetation in the Sahel of Africa, where increased areas for grazing animals have been restored. Herders have more opportunities to find forage for their animals.

Another example is the construction of the Interstate Highway System in the United States. The resulting transportation linkages to surrounding areas enlarged the functional regions served by many cities

EXPECTATIONS FOR LEARNING

Identify examples of regional change and explain the consequences related to those changes.

TOPIC: REGION**Content Statement**

13. There are interconnections within and among physical and human regions (e.g., river systems, transportation linkages, common currency).

CONTENT ELABORATION

Physical and human interconnections enable regions to interact within themselves and with other regions. The Caribbean Sea provides scenic routes connecting tourist venues in the island region.

Likewise, the Eurorail pass system provides rail passengers convenient access to a network of surface transportation among major European cities.

The North American Free Trade Agreement (NAFTA) facilitates commerce and trade among members nation – Canada, Mexico, and the United States.

EXPECTATIONS FOR LEARNING

Determine what interconnections exist in a region and how they enable interactions within its own confines and with other regions.

Content Statement

14. Regions are used as a basis to analyze global geographic issues (e.g., desertification, political disputes, economic unions).

CONTENT ELABORATION

Regions are useful in analyzing global issues. Regions can be the basis for comparative studies of particular geographic issues (e.g., social and economic issues relating to urbanization).

In the 1980s and 1990s, the nation of Somalia was in a region experiencing severe drought. It was also a region suffering through a civil war. The study of these overlapping regions helps explain why widespread famine occurred.

Tornado Alley in the central United States is a region characterized by the frequency of tornadic activity. Many storm chasers visit the region to study how storms develop and how people can protect themselves during severe weather events. As a result, many building codes are stricter in this region than in other parts of the United States.

EXPECTATIONS FOR LEARNING

Identify a region and analyze a geographic issue regarding that region.

TOPIC: HUMAN SETTLEMENT**Content Statement**

15. Patterns of settlement change over time in terms of functions, sizes, and spatial patterns (e.g., a canal town becomes an industrial city, a rural area becomes a transportation hub, cities merge into a megalopolis).

CONTENT ELABORATION

Human settlements are not static. Their functions can change. For example, a western U.S. boomtown associated with mining in the late 1800s might be a center for tourism today.

Populations of settlements change, both in size and racial or ethnic makeup. Chicago's population grew from around 30,000 people in 1850 to approximately 299,000 people in 1870, as the city became a major transportation hub. African American and eastern European immigrants made up a larger part of Chicago's population after the late 1800s.

A spatial pattern is a perceptual structure, placement, or arrangement of objects on Earth, including the space in between those objects. Spatial patterns of settlements also can change. The layout of Cairo, Egypt has changed with the movement of the Nile River, the influence of different cultural groups and the addition of neighboring towns.

EXPECTATIONS FOR LEARNING

Trace a changing functional, size, or spatial pattern of a particular human settlement and explain the reasons for the changes.

TOPIC: HUMAN SETTLEMENT**Content Statement**

16. Urbanization provides opportunities and challenges for physical and human systems in cities and their surrounding regions (e.g., development of suburbs, loss of habitat, central markets, squatter settlements on city outskirts, regional specialization in services or products, creation of ethnic enclaves).

CONTENT ELABORATION

Urban areas represent one type of human settlement. Urbanization is a process in which the percentage of people living and working in city environments increases compared with the percentage of people in rural environments. Across the globe, cities have grown in their number and in terms of spatial expansion.

Cities have major impacts on the regions that surround them. They serve as employment generators, transportation hubs, government centers and cultural attractions. While they serve their surrounding regions, they also present regional challenges. Cities can encroach upon smaller surrounding communities and rural areas, tax the capacity of regional infrastructure, affect costs of living and alter transportation patterns.

Some developments related to urbanization represent both opportunities and challenges. Industrial development may be centered within an urban area. While the industries may generate more employment, they may also pose threats to the physical environment. Suburban development around central cities may provide improved housing and, at the same time, impinge upon historical sites.

EXPECTATIONS FOR LEARNING

Compare benefits resulting from urbanization with concurrent challenges faced by surrounding regions.

TOPIC: GLOBALIZATION**Content Statement**

17. Globalization has shaped new cultural, economic, and political ideas and entities (e.g., universal human rights, European Union, terrorist networks).

CONTENT ELABORATION

Current global interactions, facilitated by communication networks, technologies and means of transportation, have impacted culture, economics, and politics.

The Internet has fostered a softening of cultural boundaries. This can be seen in the 21st century in the rise of social media and the 24-hour news cycle. Worldwide financial markets and agreements like NAFTA have spurred international investment and trade.

In the political realm, globalization has facilitated international agreements on trade as well as other issues of common concern, such as combatting terrorism and the spread of infectious diseases.

EXPECTATIONS FOR LEARNING

Describe the impact of globalization on cultural, economic, and political ideas and entities.

TOPIC: GLOBALIZATION**Content Statement**

18. Globalization has cultural, economic, physical, and political consequences (e.g., Internet access increases availability of information, outsourcing leads to regional unemployment, development of infrastructure impacts local ecosystems and economies, computer hacking into sensitive databases leads to insecurity).

CONTENT ELABORATION

Globalization has produced new dynamics in the relationships of people around the world.

Improved communications networks have facilitated the spread of American pop culture. In some societies, this is viewed as a threat to indigenous cultures.

While certain products and brands have developed a global market presence, the Internet has enabled smaller enterprises to penetrate global markets.

Improvements in air transportation have increased physical mobility while integrated transportation systems are subject to massive breakdowns due to local physical disruptions (e.g., snowstorms, volcanic eruptions).

The expansion of international trade has presented governments with issues of how to regulate the safety of goods crossing national borders. At the same time, governments have to deal with supranational organizations like the World Bank, which can impose rules and sanctions.

EXPECTATIONS FOR LEARNING

Select and analyze cultural, economic, physical, and/or political consequences of globalization.

Content Statement

19. Global trade and communication systems reduce the effect of time on the distribution of goods, services, and information (e.g., reliance on local foods versus global trade in perishable foods, online brokering versus personal brokers, Internet access versus library access).

CONTENT ELABORATION

Increasingly sophisticated transportation and communication systems have increased the scale and speed of global interactions. Time necessary for the distribution of goods, services and information has decreased dramatically. Businesses can schedule delivery of manufacturing components so that costly warehousing is no longer an issue. Computer-generated program trading can produce major swings in prices on stock markets. News and other information can be updated on an ongoing basis.

EXPECTATIONS FOR LEARNING

Describe with examples how global trade and communication systems have reduced the effect of time on the distribution of goods, services and information.