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ABSTRACT

This publication briefly describes the 1994 National Assessment of Educational Progress (NAEP) assessment in geography. In early 1994, about 19,000 students in grades 4, 8, and 12 across the nation participated. This was the first comprehensive geography assessment by NAEP and will provide baseline data to measure future progress. Sample questions from the 1994 assessment are included. NAEP geography scores are reported on a scale that ranges from 0-500. Results are reported according to geography achievement levels--basic, proficient, and advanced. The NAEP assessment includes: (1) a mixture of 228 multiple-choice items; 80 short constructed response items; and 30 extended constructed-response tasks across grades 4, 8, and 12; (2) performance tasks that require students to demonstrate geographic skills; (3) analytical tasks in which students are asked to construct geographic representations such as maps, charts, and diagrams; and (4) balanced and comprehensive coverage of topics that are engaging and relevant to students' experiences and world concerns. Charts and figures accompany the text. (EH)

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1994 NAEP Assessment in Geography

The National Assessment of Educational Progress (NAEP) is the only nationwide assessment currently used that is designed to monitor students' performance in specific subjects such as reading, writing, mathematics, science, U.S. history, and geography. In early 1994, about 19,000 students in grades 4, 8, and 12 across the nation participated in the NAEP assessment in geography. This was the first comprehensive geography assessment conducted by NAEP and will provide baseline data to measure future progress. To provide a context for understanding the assessment, the *Focus on NAEP* series presents an overview of the framework on which the geography assessment was based. Sample questions from the 1994 assessment are also presented. The NAEP geography scores are reported on a scale that ranges from 0 to 500. Results are also reported according to geography achievement levels—basic, proficient, and advanced.

The framework that guides the assessment was developed by the National Assessment Governing Board through a year-long national consensus process involving teachers, curriculum coordinators, leading geographic educators, academic geographers, assessment experts, and the general public.[1]

The 1994 NAEP geography framework requires students not only to demonstrate factual knowledge but also to think critically about geographic issues, and actively apply the knowledge and skills of geography to complex problems of our society.

Applying knowledge and skills to new and challenging tasks is important as the world becomes more connected through technological advancement and shared concerns about political, economic, social, and environmental issues.

Key Features

The NAEP geography assessment includes

- a mixture of 228 multiple-choice items, 80 short constructed-response items, and 30 extended constructed-response tasks across grades 4, 8, and 12[2];
- performance tasks that require students to demonstrate geographic skills, including the ability to use tools such as atlases to answer particular questions;
- analytical tasks in which students are asked to construct geographic representations such as maps, charts, and diagrams, as well as provide written responses; and
- balanced and comprehensive coverage of topics that are engaging and relevant to students' experiences and world concerns.

Dimensions

The 1994 geography assessment framework defines two dimensions for the assessment. These are summarized in table 1.

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Table 1.—Dimensions of the 1994 NAEP geography assessment

Cognitive Dimension	Content Dimension		
	Space and Place	Environment and Society	Spatial Dynamics and Connections
Knowing	Where is the world's largest tropical rain forest?	What mineral resources are often extracted by strip mining?	What factors stimulate human migrations?
Understanding	Why are tropical rain forests located near the equator?	Explain the effects of strip mining and shaft mining on the landscape.	Explain the motivations of modern day Mexicans and Cubans for immigrating to the United States.
Applying*	Support the conclusion that tropical rain forests promote wide species variation.	How can both economic and environmental interests be reconciled in an area of strip mining?	Compare current settlement and employment patterns of Cuban and Mexican immigrants in the United States.

*Applying = a range of higher order thinking skills.

Note: Example questions in the matrix cells are illustrative only and are not meant to represent the full array of assessment objectives.

Source: Geography Assessment Framework for the 1994 National Assessment of Educational Progress (Washington, DC: National Assessment Governing Board, U.S. Department of Education, U.S. Government Printing Office).

Content Dimension

Three broad areas make up the content dimension of the geography assessment. These content areas are represented in table 1 as *Space and Place*, *Environment and Society*, and *Spatial Dynamics and Connections*.

Space and Place

The study of Space and Place refers to knowledge and understanding of geography as it relates to particular places on Earth, to spatial patterns on the Earth's surface, and to physical and human processes that shape these patterns. Topics falling within this content area are described in table 2.

Table 2.—Topics within Space and Place

Fundamental place location

- Physical features and patterns of the physical environment such as major landforms, bodies of water, climate, and vegetation regions
- Features and patterns of the human environment such as urban centers, farming regions, and political divisions

Fundamental geographic concepts and methods

- Concepts such as absolute and relative location, proximity, separation, direction, region, hierarchy, density, dispersion, and methods that are used to describe and analyze spatial patterns
- Basic spatial units of measurement such as distance and area
- Absolute location systems such as latitude-longitude and alpha-numeric grids, and relative location terms such as near to and distant from

Fundamental physical geography

- Major spatial features and patterns in the natural environment such as those relating to climate, oceans, soils, landforms, and vegetation
- Major processes, such as atmospheric circulation, weathering and erosion, ocean currents, plate tectonics, and vulcanism that shape patterns in the natural environment

Fundamental human geography

- Major spatial features and patterns in the cultural environment such as language, religion, agriculture, and economic, political, and demographic regions
- Major processes, such as settlement, migration, trade, technological development, diffusion, and landscape transformation that shape cultural patterns

Sample Question A (Space and place)

Grade 4. On the map above, write the names of the North Pole, the South Pole, and the Equator in the correct location. (The actual map is large enough to write on).

Scoring Guide

Scoring rationale: Student locates and correctly labels the North Pole, South Pole, and the Equator on a map showing the Western Hemisphere.

3–Complete. The response correctly labels all three features on the map. (54.2 percent correct; standard error 1.5)

2–Partial. The response correctly identifies the location of one or two features on the map. (26 percent correct; standard error 1.2)

1–Inappropriate. The response does not correctly locate any of the three features. (7.2 percent correct; standard error 0.7)

Sample Question B (Space and place)

Grade 12. Under which of the following circumstances would you be most likely to find snow in equatorial regions?

A. In areas below sea level
B. In areas at high latitudes
*C. In areas at high elevations
D. In winter

*Key: C. (67.5 percent correct; standard error 1.3)

Environment and Society

Environment and Society focuses on relationships between the natural world and the people who inhabit it. Through knowledge of environment-society interactions, geography helps students learn how people depend upon, adapt to, are affected by, and modify the natural environment. Many modifications, such as planting trees to reduce erosion from winds, may have positive consequences. Other modifications, such as locating a landfill over a ground water source, may have negative consequences. The continually developing force of technology requires that society give even greater attention to the results and potential outcomes of environment-society interactions. Topics falling within this content area are described in table 3.

Table 3.—Topics within Environment and Society

Unity

- Interaction among Earth's natural systems such as the hydrosphere, lithosphere, biosphere, and atmosphere
- Interactions among Earth's human systems such as urban, agricultural, political, economic, and transportation systems
- Interactions among natural and human systems such as a forest and a recreation area
- Changes in one system that lead to changes within the system and in other systems such as the impact of El Niño on commercial fishing or the effects of drought on forest fires
- Changes in a system that impact locally, regionally, and/or globally such as the eruption of Mount Pinatubo in the Philippines and its effect on the world's climate

Limits

- The environment's limits in absorbing the impacts of human activity such as the impact of the imported Mediterranean fruit flies on California's produce production or over-hunting on the elephant population and tourism industry of Kenya
- Human adaptations to, or modifications of the environment influenced by the characteristics of specific environments such as weather and climate, landscape features, and natural resources
- Positive and negative consequences of human changes to the environment such as over-grazing and plowing arid land that may temporarily increase food production but, over time, contribute to desertification
- Human systems affected by the characteristics of natural systems such as weather, plate tectonics, and vulcanism

Implications of technology

- Uses of technology that result in changes to the environment both intended and unintended. Transporting oil or chemicals by ship or rail, for example, can harm the environment if an accident occurs
- Positive and negative consequences of the uses of technology on the environment and society, such as automobiles enhancing human mobility but car exhaust decreasing air quality

Perspectives

- People's differing perceptions of the same environment based on their experiences and interests (For example, a developer and an environmentalist may view the use of forest land at the edge of a city very differently. A farmer and an urban dweller may perceive the construction of a chemical fertilizer plant outside of town very differently.)
- People's changing perceptions of environmental modification over time, such as perceptions of industrial smokestacks of the 1920s versus the 1990s or the use of forest resources in the 19th and 20th centuries

Sample Question C

Grade 8. Nuclear energy can be developed for peaceful purposes.

What is one argument in favor of developing nuclear energy for peaceful purposes?

_____

_____

_____

_____

What is one argument against developing nuclear energy for peaceful purposes?

_____

_____

_____

_____

Scoring Guide

Scoring rationale: Student demonstrates knowledge of an argument for and against developing nuclear energy.

3–Complete. The response presents one significant argument in favor of nuclear power and one significant argument against nuclear power for peaceful purposes. Correct answers may be drawn from the list given or include some other appropriate response.

2–Partial. The response presents a significant argument either for or against nuclear power. Other argument, if present, is insignificant or incorrect.

1–Inappropriate. The response fails to present a significant argument for either side of the issue. It may provide personal opinions or inaccurate assertions. Examples are that nuclear reactors are ugly, or that they are completely safe.

(47.3 percent correct; standard error 1.4)

Sample Question D

Grade 4. Most air and water pollution is caused by
A. ocean currents
*B. people
C. earthquakes
D. animals
*Key: B. (78.3 percent correct; standard error 1.3)

Spatial Dynamics and Connections

Geography's spatial perspective helps students understand the dynamics of connections among people, places, and regions. Connections are made when people travel from place to place, when ideas and beliefs such as capitalism or Islam spread across the world, or when products such as petroleum and automobiles move from producing to consuming areas.

Connections among people and places are influenced by a wide variety of factors including trade relationships, political tensions and changes, human migration, and technical change. Their effects may be positive in providing expanded opportunities and progress. They also may be negative, for example, in the case of disease or military conflict. Or they may combine both positive and negative consequences in the sense of advantages for some and hardships for others. (Topics falling within this content area are described in table 4.)

Table 4.—Topics within Spatial Dynamics and Connections

Spatial dynamics

- The effect of a variety of factors on the organization and identity of regions such as a neighborhood, a metropolitan area, or the American Midwest
- The effect of factors such as proximity and distance on relationships between and among places
- The effect of concepts of specialization and comparative advantage on the location of economic activities such as U.S. specialization in commercial airplane production. The United States dominates in this field and therefore has a comparative advantage over other nations
- The effect of diverse cultures on the characteristics of places and regions such as ways in which American grid cities differ from Islamic cities or ways in which various cultures construct housing

Connections

- Concepts that are related to connections between people, places, and regions such as systems and networks
- Changes in information systems, communication networks, and transportation technologies that increase connections such as in the building of supertankers or in the completion of the Trans-Alaska Pipeline
- Distinct patterns of function in urban, suburban, and rural regions such as land use and service requirements
- Geographic factors that contribute to conflict and cooperation in social, political, and economic settings on a variety of scales, such as neighborhood youth and their perception of a local park as their territory or the varying national claims on seabed resources
- Trans-regional organizations—alliances, cartels, and formal international organizations—that are formed to address common issues and to modify spatial characteristics such as the creation of the Organization of Petroleum Exporting Countries (OPEC) to influence the international price of petroleum

Movement

- Natural and cultural phenomena that are spread by diffusion throughout the world such as coffee, cocaine, and capitalism
- Voluntary and involuntary human migration patterns such as Russian Jews to Israel, or Mexicans to the United States.
- Unequal distribution of resources that generate trade, encourage interdependence and shape economic patterns such as U.S. export of lumber to—and import of electronics from—Japan

Living conditions

- Standards of living that relate to regional economic differences and relationships such as cities to farms, the Rust Belt to the Sun Belt, or the United States to Canada and Mexico

Sample Question E

Grade 12. Maddieville is building a new shopping center. There is a disagreement in the city council over whether to build the shopping center at site A or at site B on the following chart. As a resident of the city who would like to shop at the shopping center, write a letter to the mayor in support of either site A or site B. Give three reasons why the site you support is better than the other site.

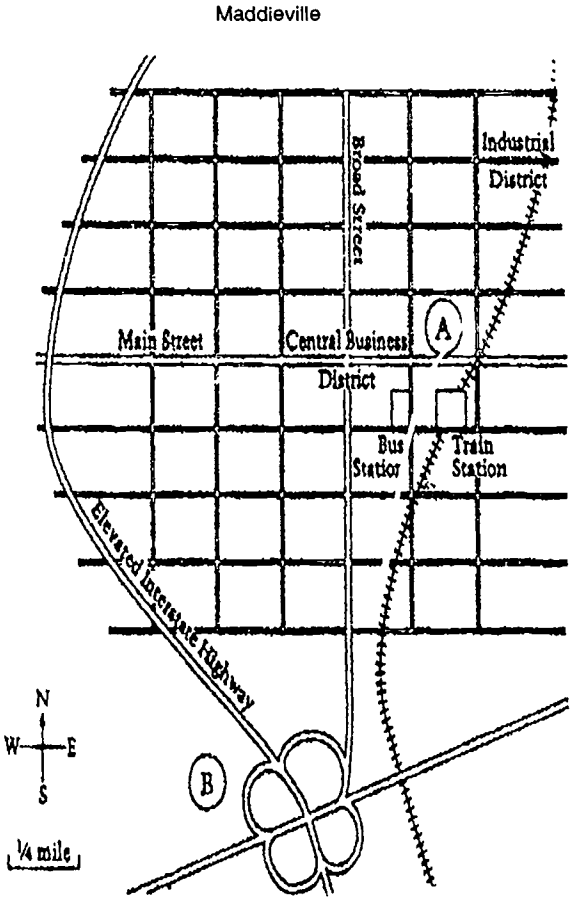
Scoring Guide

Scoring rationale: Student demonstrates the ability to judge the placement of a new shopping center based on evidence given on a map.

4–Complete. The response identifies a site and supports the choice with three reasons. (14.9 percent correct; standard error 1.1)

3–Essential. The response identifies a site and supports the choice with two reasons. (39.8 percent correct; standard error 1.3)

2–Partial. The response identifies a site and supports the choice with one reason. (28.7 percent correct; standard error 1.4)



1–Inappropriate. The response may or may not identify a site, but it does not offer any support for either location. (9.8 percent correct; standard error 0.8)

Sample Question F

Grade 8. What is an important reason that skyscrapers were built in American cities?

A. Construction companies liked to build structures that made residents feel as if they lived in single-family houses.
B. Skyscrapers allowed tenants to create a closer community.
*C. Skyscrapers allowed people to use small amounts of land more efficiently.
D. Citizens wanted to be safe from street crime.

*Key: C. (79.5 percent correct; standard error 0.9)

Cognitive Dimension

Three cognitive areas displayed as horizontal rows in table 1 specify areas of thinking expected of students as they embrace specific geography content. These cognitive areas are defined as *knowing, understanding,* and *applying.* The cognitive dimension tests the student's ability to perform mental tasks in these areas and expects students in grades 4, 8, and 12 to be able to think geographically in all three ways as they work with the content that is appropriate to their grade level.

Knowing (What is it? Where is it?)

In the area of *knowing,* students should be able to perform two related functions with respect to information: an observation function, such as observing different elements of the landscape; and a recall function, such as the name of a place or a resource indigenous to a particular country (see sample questions A and F).

Understanding (Why is it there? How did it get there? What is its significance?)

Understanding refers to the ability to see connections between diverse bits of geographic information, and to use that information to explain existing patterns and processes on Earth. For example, students may understand the concept of differential heating and cooling of air over land and water well enough to explain what is occurring in the atmosphere to cause this phenomenon (see sample questions C and D).

Applying (How can knowledge and understanding be used to solve geographic problems?)

Applying refers to a range of higher-order thinking skills. Students are genuinely competent in geography when they are able to apply the knowledge and understanding of the discipline to real-life situations, allowing them to make personal decisions and seek solutions to societal problems. Examples of contemporary issues are the spread of diseases like AIDS or the suitability of different waste disposal programs to the needs of a particular urban center. To function in the Applying mode, students must be able to classify, hypothesize, analyze, synthesize, and evaluate information (see sample questions B, C, and E).

The results of the assessment will be reported in the fall of 1995 in The *NAEP 1994 Geography: A First Look* report and *The Geography Report Card.* The results in these publications will be interpreted in the context of background variables such as television watching, number of geography courses taken, teacher qualifications, time spent teaching specified skills and topics, and computer availability.

Notes

[1]Geography Assessment Framework for the 1994 National Assessment of Educational Progress (Washington, DC: National Assessment Governing Board, U.S. Department of Education, U.S. Government Printing Office).

[2]Short constructed-response items usually require a phrase or a few sentences as an answer. Extended constructed-response tasks usually require in-depth answers. Both are scored according to specific criteria.

The Focus on NAEP series briefly summarizes information about the ongoing development and implementation of the National Assessment of Educational Progress. The series is a product of the National Center for Education Statistics (NCES), *Gary W. Phillips*, Associate Commissioner for Education Assessment. This issue was written by *Sheida White* from NCES and *Christine O'Sullivan* from Educational Testing Service. Readers are invited to comment by contacting the first author at NCES, Education Assessment Division, 555 New Jersey Avenue NW, Washington, DC 20208–5653. To order NAEP publications, call Bob Clemons at 202–219–1690.

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