

MapStats for Kids: Developing and Assessing Web-Based Tools to Foster Geographic and Statistical Literacy in Children

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Abstract

The main goal of the *MapStats for Kids* Project, a subproject within the Quality Graphics for Federal Statistical Summaries Project, is to design and provide online learning tools for students (grades 4-8) that support statistical, geographic, cartographic, and domain literacy. In designing these tools another key goal is to create web applications that match (or can be customized to match) school curricula, allowing educators to incorporate these tools into their lesson plans. The online learning activities are designed to address national education standards such as the *National Geography Standards*, the *Principles and Standards for School Mathematics*, and the *National Standards for Civics and Government*.

During the course of the project we have developed three online learning activities--**The Election Map Game**, **The Linked Representation Tool**, and **The Network Challenge**--and we have begun work on our latest application, **The Region Selection Tool**. All of these web applications have been developed with Flash, a software package for designing dynamic, interactive graphics for the web. While Flash is not a Geographic Information System (GIS), we have been working on extending Flash to include some "GIS-like" functionality. We have also designed the tools to be extensible, making use of XML to transfer data in and out of the applications. The extensible nature of these applications is an important feature, allowing the applications to be tailored to complement a variety of curricula.

The **Election Map Game** allows children to explore the results of the 2000 Presidential Election. The goal is to "paint" each state depending on which party won that state in last presidential election. This game teaches kids how to transfer information from one representational form (i.e., bar chart and numbers) to another form (i.e., choropleth map). The **Linked Representation Tool** concentrates on a skill that is at the core of understanding the mapping of statistics: the ability to move between graphical and tabular representations of information. This tool demonstrates and explores the connections between three alternative ways to visualize information: the map, the table (spreadsheet), and the graph. The **Network Challenge** uses a network travel map to address a range of learning objectives, with a focus on understanding topological relationships and developing problem solving strategies to support spatial decision-making. The **Region Selection Tool** operates on three spatial scales: national, state, and greater metro area. At each scale, the goal is to classify the units (states, counties, or ZIP-codes) into four *regions* (groups of *contiguous units*) that are of equal value for a selected attribute.

The *MapStats for Kids* project includes work toward assessing the usability of the applications being developed and toward matching the applications with specific learning objectives. During the spring of 2003 two major use and usability assessments will be conducted through the GeoVISTA Center and the Bureau of Labor Statistics (BLS).