

ITS Resource Center Home

Spatial Thinking and Analysis

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What will your students learn by using GIS or other mapping tools? They will gain analytical experience in spatial thinking with real-world data. GIS is a great tool for spatial analysis with geographically-oriented data, where other types of analyses are inadequate. Students can engage in problem-solving with data they can find themselves, tailored to the subject. GIS instruction would need to be incorporated into a course, but internet-based mapping tools can be used effectively with existing online tutorials.

ESRI's [GIS.com](http://www.esri.com) is a great "getting started" web site which explains what GIS is and how and where these tools are used. In addition, the web site offers resources such as sample mapping software, free e-books and resources for learning GIS (Geographic Information Systems), such as [Learn ArcGIS](http://www.esri.com/learn/arcgis).

ESRI's [EdCommunity](http://www.esri.com/edcommunity) page goes a bit deeper with many more educational resources, including [SpatialLABS](http://www.esri.com/spatiallabs), which "concentrates on introducing, developing and reinforcing spatial reasoning and analysis skills."

[TeachSpatial](http://www.teachspatial.com) is 1) a spatial window into the National Science Digital Library; 2) a site about spatial thinking; 3) a community of interest; and 4) a collection of directories of publications and links on spatial topics.

ESRI's Education Curriculum Development Manager has written an article on "[Developing Spatial Thinking Skills in Education and Society](#)" which offers several useful definitions of spatial skills.

To help students understand some of the issues involving map projections, try your hand at the [Mercator Puzzle](#) from Google Maps.

From SERC at Carleton College, browse a [collection of resources](#) related to understanding spatial thinking in the geosciences.

Here is a tutorial on [Spatial Thinking](#) from Columbia University which addresses the issue of "why some students have trouble with maps and spatial representations."

Penn State University has produced [The Geospatial Revolution](#), "an integrated public service media and outreach initiative about the world of digital mapping and how it is changing the way we think, behave, and interact."

For the more technically-minded, Penn State offers an online course, "[The Nature of Geographic Information](#)." The foundational text on [Geospatial Analysis](#) is now available online in several different formats.

[Jason Davies'](#) site features his work in freelance data visualization, including a slew of incredibly innovative [maps](#), including this amazing [animated map projection tool](#).

The following sites might help you to think about visualizing information: [Information is Beautiful](#); [EagerEyes](#); [FlowingData](#); [GapMinder](#); [Data Pointed](#); and [Infosthetics](#). And, if you haven't run

across them yet, take a look at the now-classic works of [Edward Tufte](#).

[Milestones in the History of Thematic Cartography, Statistical Graphics, and Data Visualization](#) provides a history of the development of statistical representation in maps, charts and timelines with many references and resources.

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