

# Core Elements of GIS



## Create Geographic Data

**Skills:** Use GIS activities to hone students' understanding of data. Goals include

- Know the types and characteristics of spatial data
- Understand the capacities and limitations of different data types
- Generate, organize, and document spatial data using different technologies

**What to do:** Import latitude/longitude coordinates from GPS or tables; digitize and save map features; scan existing maps and register them to their location on earth; keep data, maps, and documents organized.

**Why it's important:** Location-based data is the heart of a geographic information system. Good decisions require good maps and analyses, which require good data. Characteristics of data influence what it can be used for. GIS users should be able to gather, create, understand, and use data for a wide variety of tasks.



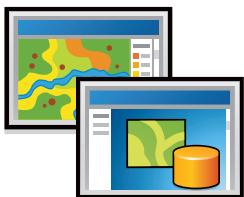
## Analyze Data

**Skills:** To gain a proper appreciation for GIS technology, students must experience its capacity to analyze spatial data. Goals include

- Understand analytical methods and use them appropriately
- Get information about features by pointing to them (in a map or table)
- Seek features matching specific attribute or location criteria
- Analyze data using different technologies

**What to do:** Extract meaning from spatial data through interactive query; plan logical analysis workflows including inputs and outputs; keep a log of analytical workflow used; draw conclusions from analysis results.

**Why it's important:** Without analysis, GIS is just cartography. Asking questions of the data allows GIS to be a problem-solving toolkit. GIS uses the power of the computer to analyze geographic relationships and patterns using spatial and quantitative methods that would otherwise be impossible to discover or describe.



## Represent Data

**Skills:** Knowing how to represent data comes into play throughout the geographic inquiry process. Goals include

- Understand and use different classification methods, being conscious of the chance to emphasize or camouflage differences
- Understand and use different symbolization strategies
- Consider established cartographic principles and the ethics of communication
- Represent data using different technologies

**What to do:** Classify and symbolize spatial data; understand and create map legends; create maps, charts, and other elements to communicate geographic information for a particular audience or purpose.

**Why it's important:** Representing data in particular ways can highlight or obscure key elements. Doing it well enhances communication; doing it poorly confuses or disguises the story.