

What do you want your students to be able to do?

Examples of Learning Objectives for Reasoning with Data Maps

(more examples at <http://americanmigrations.uic.edu/learningobjectives.htm>)

Students will be able to ...

1. ... make clear, accurate **observations** from a data map
They can describe a GIS map using details, descriptions, comparisons and examples: "It's darker over here than over there," "There is a cluster near the ocean," or "There are a lot of black people in Mississippi." Better observations are easy to understand, and help others see what you are seeing.

2. ... make clear, relevant **inferences** about the data, connecting to other texts or prior knowledge
They can connect the things they see in the map to things they have read about or heard about. Inferences don't have to be correct, but they should be clear. "Maybe there are more people because they can get a job there." "This area is by the river, and we read about people traveling on the river." Better inferences are relevant to what we are studying, with a clearly explained connection.

3. ... make specific, accurate **comparisons** of data maps
They can describe specific ways two maps are similar and/or different, clearly and accurately, using words and gestures to show the comparison.
 - They might compare maps of the same place in different years, showing change over time
 - They might compare maps of two different places, to show how they are similar / different
 - They might compare *geographic features* on the maps, or compare the *data* on the maps

4. ... correctly read and interpret a **map legend**
They can state what different colors, shapes, numbers, or labels on the map refer to, using the legend to look things up. They can use the legend to find answers to questions about what the map shows.

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Students will be able to ...

5. ... name examples of **census variables**, and find which variables are available in a data map
- They can give several examples of variables used in the census (such as population, race, education level, ancestry, family income, employment). They could name them from memory, and also should be able to find them in the web site. Better answers might include more specifics: "percent high school graduate," "African American population," "percent employed."
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6. ... give examples of **inconsistencies** between census data maps and the real world
- They can give examples of ways that data (or data maps) may be misleading or wrong. For example:
- The data could be wrong because there may have been mistakes in counting people.
 - The census could be misleading because of the government's decisions of who to count, who not to count, and what to call people (such as Hispanic, Mexican, Native American).
 - The data could be misleading because of how they were collected – for example, the census did not ask the same questions every year, so data are missing in some years.
 - A map could be misleading because the shapes or colors can give you the wrong idea (for example, dark colors may mean high percentage instead of high population number).
- Better explanations show that students know that there is a difference between the map and the real world (the map is not necessarily the truth). Even better explanations might show that they know that people collected the data, and those people made decisions we may or may not agree with.