Celebrate Geologic Map Day!

FRIDAY, OCTOBER 18, 2019

LEARNING ACTIVITY:

CLEAR AS BLACK AND WHITE

Grade Level: 6-10
Source: American Geosciences Institute.

What are some of the factors that might unnecessarily exclude people from learning about or working in the geosciences? Culture? Ethnicity? Sex? Language? A disability? Where they live? How much they earn? Something else?

Let's examine a disability-related factor. Considering the important role that color plays in many geologic maps, one might suppose that color blindness would prevent a person from reading or using geologic maps. But that's not necessarily so. Map makers use multiple methods, including patterns and strategic selection of colors, to help make the information conveyed in multi-colored geologic maps intelligible to everyone, including color-blind viewers.

And then there are some geoscience professionals — such as land managers, the professionals who manage the use and development of urban and rural land resources — who can effectively read and work with geologic maps, like the one show here, which employ no color at all.

Materials

- Geologic Map of Boone and Winnebago Counties in Illinois (shown here)
- Computer with internet access

Procedure

1. Pretend you are a land manager in northern Illinois. As part of your job, you must help a real estate developer figure out where would be a good place to construct a five-level office building, including a parking garage below the earth's surface.

2. Discuss what kinds of information about the geology of the area you would need to help make such a determination. Surface earth material? Stability of earth material below the surface? Depth of groundwater beneath the surface? Risk of groundwater movement or contamination? Whether land is flat or sloping? Depth of bedrock? Other information?

3. In search of relevant information, you find a geologic map featuring an array of colors representing geologic materials at the land's surface. A cross-section featured in the map allows you to infer the geology beneath the surface from a diagram, but not in a precise way.

4. Discuss how useful this map would be in helping to plan a construction project. What does such a map tell you? What does it not tell you that you would like to know? Is this map likely to give the real estate developer the confidence needed to invest in construction?

5. Next you contact the Illinois State Geological Survey and ask for another map. The state geologist provides the Geologic Map of Boone and Winnebago Counties in Illinois shown here. In addition to describing the character of the geologic unit at the land's surface, this map represents the layers of geologic materials below the land's surface, telling how deep they go at various locations.

6. Examine the accompanying text and discuss what this geologic map tells you. What areas would be most favorable for construction? What areas would be least favorable? Why? How would this information be important to a builder selecting a location to dig, lay a foundation, and construct an office building?

7. Now that you have explored northern Illinois, consider your hometown, your state, or another location. Visit the website of your state geological survey or state geologist (**http://www.stategeologists.org/**) and the National Geologic Map Database (**http://ngmdb.usgs.gov/**). Find geological maps for the area you want to examine.

8. Discuss: What do you notice in these maps? Where do people choose to live and work? What can you tell about the area's geology? How do geologic maps present information in different ways to ensure that they are useful to everyone? How do the maps use — or not use — color? What about the map might be more or less easy to interpret if someone were color blind?

NGSS Connections

- Science and Engineering Practices — Obtaining, Evaluating, and Communicating Information
- Disciplinary Core Ideas — Earth and Human Activity
- Crosscutting Concepts — Systems and System Models