NGSS Crosscutting Concepts Scavenger Hunt

What work do crosscutting concepts accomplish in the world around us?
or...
How can the world around us help us understand the value of crosscutting concepts?

Your task:

- Grab your notebook!
- Take a look around campus
- What crosscutting concepts do you see?
- *What* work is done by these concepts? *By* whom? *For* whom?
- Document what you find (*what*, *by*, *for*) in your notebook.
- Come back and share what you discovered!

We have 25 minutes to explore, so don't roam too far! If you don't get to all the crosscutting concepts, don't worry.

Some ways to approach this task:

- Explore by location - choose a specific place and look for as many concepts as possible in that spot before moving on.
- Explore by concept - choose a concept and look at campus through that lens. Once you find the concept, document it, and choose another.

NGSS crosscutting concepts (see backside for more details):

- Patterns
- Cause and effect
- Scale, proportion, and quantity
- Systems and systems model
- Energy and matter
- Structure and function
- Stability and change

From the NGSS,
Appendix G – Crosscutting Concepts

Crosscutting concepts have value because they provide students with connections and intellectual tools that are related across the differing areas of disciplinary content and can enrich their application of practices and their understanding of core ideas. — Framework p. 233

A Framework for K-12 Science Education: Practices, Core Ideas, and Crosscutting Concepts (Framework) recommends science education in grades K-12 be built around three major dimensions: scientific and engineering practices; crosscutting concepts that unify the study of science and engineering through their common application across fields; and core ideas in the major disciplines of natural science. The purpose of this appendix is to describe the second dimension— crosscutting concepts—and to explain its role in the Next Generation Science Standards (NGSS).

The Framework identifies seven crosscutting concepts that bridge disciplinary boundaries, uniting core ideas throughout the fields of science and engineering. Their purpose is to help students deepen their understanding of the disciplinary core ideas (pp. 2 and 8), and develop a coherent and scientifically based view of the world (p. 83.) The seven crosscutting concepts presented in Chapter 4 of the Framework are as follows:

1. **Patterns**. Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.

2. **Cause and effect**: Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.

3. **Scale, proportion, and quantity**. In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.

4. **Systems and system models**. Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.

5. **Energy and matter**: Flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.

6. **Structure and function**. The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.

7. **Stability and change**. For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.