**Crosscutting Concepts in the Science Standards for Alaska**

Crosscutting concepts (CCCs) are essential tools for teaching and learning science that help students understand the natural world by making sense of phenomena across scientific disciplines. CCCs provide a scaffold upon which teachers and students can organize the cognitive structures for unifying the science disciplines.

**The Crosscutting Concepts include:**

**Patterns**Observed patterns of forms and events guide organization and classification. Patterns prompt questions about the factors that influence cause and effect relationships. Patterns are useful as evidence to support explanations and arguments.

**Cause and Effect**Events have causes, sometimes simple, sometimes multifaceted and complex. 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.

**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.

**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.

**Energy and Matter**   
Flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the system’s possibilities and limitations.

**Structure and Function**   
An object’s structure and shape determine many of its properties and functions. The structures, shapes, and substructures of living organisms determine how the organism functions to meet its needs within an environment.

**Stability and Change**For natural and built systems alike, conditions of stability and rates of change provide the focus for understanding how the system operates and the causes of changes in systems.