

Grade 1: Cited CCCs and their Bullets

PATTERNS In Grades K-2, children recognize that patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

- **Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.** (K-ESS2-1), (1-LS1-2), (1-LS3-1), (1-ESS1-1), (1-ESS1-2)

CAUSE AND EFFECT In grades K-2, students learn that events have causes that generate observable patterns. They design simple tests to gather evidence to support or refute their own ideas about causes.

- **Simple tests can be designed to gather evidence to support or refute student ideas about causes.** (K-PS2-1), (K-PS2-2), (1-PS4-1), (1-PS4-2), (1-PS4-3), (2-PS1-2)

STRUCTURE AND FUNCTION In Grades K-2, students observe that the shape and stability of natural and designed objects are related to their function(s).

- **The shape and stability of structures of natural and designed objects are related to their function(s).** (K-2-ETS1-2), (1-LS1-1), (2-LS2-2)

Dr. Art's Recommendations re CCCs in Grade 1

NOTE: Please read the Dr. Art recommendations for the K-2 Grade Span before reading the recommendations for this grade level.

As in Kindergarten, the two main cited CCCs in Grade 1 are **Cause and Effect**, and **Patterns**. These two CCCs are particularly appropriate for first grade since humans naturally see patterns in the world, and also try to explain the patterns in terms of what might be causing them.

Patterns that are embedded in Grade 1 Performance Expectations and phenomena include behavioral patterns that help offspring survive (1-LS1-1 and 1-LS1-2); motions of the Sun, Moon and stars (1-ESS1-1); hours of sunlight in different times of the year (1-ESS1-2); and the ways in which different materials interact with a beam of light (1-PS4-3).

The Grade 1 **Cause and Effect** CCC bullet that is cited focuses on testing causal explanations: "Simple tests can be designed to gather evidence to support or refute student ideas about causes." In general it is much easier for students to design simple test of cause and effect relationships in physical science contexts than in life or Earth/space science. In first grade appropriate physical science contexts include how objects create sound and how objects interact with light (1-PS4-1 and 1-PS4-3).

First Grade also includes one citation for the CCC of **Structure and Function**: "The shape and stability of structures of natural and designed objects are related to their functions." This CCC bullet is also an example of a **Pattern**. A bowl is round, a knife is sharp, and a fork has prongs. Each shape helps the object do what it is designed to do.

The Grade 1 Performance Expectation that cites this **Structure and Function** CCC is 1-LS1-1: "Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs." The Clarification Statement associated with this PE provides particularly helpful suggestions such as keeping out intruders by mimicking thorns on branches or animal quills. Performance Expectation 1-PS4-4 also provides opportunities that directly associate with this CCC: "Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance."