

Grades K-2 NGSS CCCs¹

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. (2-ESS2-2), (2-ESS2-3), (2-PS1-1)**
- **Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)**
- **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.

- **Events have causes that generate observable patterns (K-ESS3-2), (K-ESS3-3), (K-PS3-1), (K-PS3-2), (2-LS2-1), (2-PS1-4)**
- **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)**

SCALE, PROPORTION, AND QUANTITY

SYSTEMS AND SYSTEM MODELS In Grades K-2, students understand that objects and organisms can be described in terms of their parts and that systems in the natural and designed world have parts that work together.

- **Systems in the natural and designed world have parts that work together. (K-ESS2-2), (K-ESS3-1)**
- **Objects and organisms can be described in terms of their parts.**

ENERGY AND MATTER In Grades K-2, students observe that objects may break into smaller pieces, be put together into larger pieces, or change shapes.

- **Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3)**

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)**

STABILITY AND CHANGE In Grades K-2, students observe that some things stay the same while other things change and that things may change slowly or rapidly.

- **Things may change slowly or rapidly. (2-ESS1-1), (2-ESS2-1)**

¹ Items in grey have no citations in Grades K-2 Performance Expectations.

Dr. Art's Recommendations re K-2 CCCs

NOTE: Please read these grade span recommendations before reading the recommendations for a specific K-2 grade.

Throughout the K-2 grade span, the two main cited CCCs are **Patterns** and **Cause and Effect**. These 2 CCCs are particularly appropriate for this grade span since humans are hard-wired to notice patterns in the world, and also try to explain the patterns in terms of what might be causing them. Four of the other five CCCs are occasionally cited. Even those citations can generally be considered as specific examples of a pattern. The **Scale** CCC is not cited at all in K-2 and the **Systems and System Models** CCC is cited only once.

This focus on two CCCs can help reduce the anxiety and challenge with respect to both learning about and using CCCs in lower elementary grades. The close relationship between the CCCs of **Patterns** and **Cause and Effect** is evident in their bullet statements. One frequently cited **Patterns** bullet states how a pattern can be used as evidence. One frequently cited **Cause and Effect** bullet states that events have causes that generate observable patterns. Repeatedly using these two powerful CCCs throughout the K-2 grade span can help deepen student skills in using these CCCs as lenses to begin to understand and investigate a new phenomenon. This focus is very appropriate and should be very effective.

The K-2 grade span also includes some citations for the CCCs of **Energy and Matter**, **Structure and Function**, and **Stability and Change**. As noted in the first paragraph, each of the bullet statements for these three different CCCs can generally also be considered as a statement of a **Pattern**. For example, Performance Expectation 2-ESS1-1 states: "Use information from several sources to provide evidence that Earth events can occur quickly or slowly." The phenomena that students research and cite can be described both as examples of **Stability and Change** and also of **Patterns**.

This overlap of other CCCs with the **Patterns** CCC can help students appreciate that some patterns are so general that they provide an important way to begin to understand and investigate a new phenomenon. Instead of looking for any kind of pattern, learners can be guided to look at whether and how a phenomenon changes; how energy and matter are involved; or how the structure of objects are related to their functions. Which CCC is used or cited depends on the purpose of the investigation, the details of the specific phenomenon, and/or the personality, skills and prior experiences of the investigator. There is no single correct CCC that must be exclusively used in association with a given phenomenon.