

Science Expert Panel (SEP) Edits to  
Next Generation Science Standards (NGSS) Clarification Statements

Edits to the Seven NGSS Clarification Statements are in Bold within the Clarification Statement.  
SEP Rationale for the Edits Appear in Italics.

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## Earth and Space Sciences

**5-ESS1-1. Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth.** [Clarification Statement: **Absolute brightness of stars is the result of a variety of factors. Relative distance from Earth is one factor that affects apparent brightness and is the one selected to be addressed by the performance expectation.**] [Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).]

*Rational for Edit: The original NGSS standard does not have a Clarification Statement. The SEP felt one was necessary.*

**5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.** [Clarification Statement: **The geosphere, hydrosphere (including ice), atmosphere, and biosphere are each a system and each system is a part of the whole Earth System.** Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]

*Rational for Edit: The SEP believed the addition of the first sentence to the Clarification Statement was needed to reinforce the importance of each system individually and collectively. No language was deleted from the original NGSS Clarification Statement.*

**HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.** [Clarification Statement: **The carbon cycle is a property of the Earth system that arises from interactions among the hydrosphere, atmosphere, geosphere, and biosphere.** Emphasis is on modeling biogeochemical cycles that include the cycling of carbon through the ocean, atmosphere, soil, and biosphere (including humans), providing the foundation for living organisms.]

*Rational for Edit: The SEP believed the addition of the first sentence, although it might appear redundant, was needed to reinforce the importance of the carbon cycle as a property of the Earth system rather than focusing on specific biogeochemical cycles. No language was deleted from the original NGSS Clarification Statement.*

## Life Sciences

**4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.** [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin. **Each structure has specific functions within its associated system.**] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]

*Rational for Edit: The SEP believed the addition of the second sentence was needed to illustrate that the listed structures are important and serve a specific function to the a larger system. No language was deleted from the original NGSS Clarification Statement.*

**MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. [Clarification Statement: Emphasis is on developing evidence that living things (including Bacteria, Archaea, and Eukarya) are made of cells, distinguishing between living and non-living cells, and understanding that living things may be made of one cell or many and varied cells. Viruses, while not cells, have features that are both common with, and distinct from, cellular life.]**

*Rational for Edit: The SEP believed the addition of the parenthetical phrase and last sentence were needed. The parenthetical phrase stipulates that this addresses the three Domains of living things. The last sentence was considered useful. No language was deleted from the original NGSS Clarification Statement.*

## Physical Sciences

**4-PS3-1: Use evidence to construct an explanation relating the speed of an object to the energy of that object. [Clarification Statement: Examples of evidence relating speed and energy could include change of shape on impact or other results of collisions.] [Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.]**

*Rational for Edit: The original NGSS standard does not have a Clarification Statement. The SEP felt one was necessary.*

**5-PS1-4: Conduct an investigation to determine whether the mixing of two or more substances results in new substances. [Clarification Statement: Examples of combinations that do not produce new substances could include sand and water. Examples of combinations that do produce new substances could include baking soda and vinegar or milk and vinegar.]**

*Rational for Edit: The original NGSS standard does not have a Clarification Statement. The SEP felt one was necessary.*