

Language Based Mapping of Science Assessment Items to Skills: Appendix

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A Sample Questions

Three crosscutting concept and topic description and associated sample questions from the data set are given below.

A.1 NGSS Cross Cutting Concepts

Cause and Effect students classify relationships as causal or correlational, and recognize that correlation does not necessarily imply causation. They use cause and effect relationships to predict phenomena in natural or designed systems. They also understand that phenomena may have more than one cause...

Q: If the same sedimentary rock layer is found on either side of a valley...

- a. The rocks on one side were moved across by earthquake action.*
- b. The rock formed in the same environment and the valley was cut into the rock later.*
- c. The rocks look the same but they are two separate rocks formed in two separate ways.*
- d. There is something wrong because this could never happen in nature.*

System and System Models students can understand that systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. They can use models to represent systems and their interactions such as inputs, processes and outputs and energy, matter, and information flows within systems. They can also learn that models are limited in that they only represent certain aspects of the system under study...

Q: Bohrs atomic model explains all of the behaviors of electrons in atoms of all elements.

- a. true*
- b. false*

Scale, proportion and quantity students observe time, space, and energy phenomena at various scales using models to study systems that are too large or too small. They understand phenomena observed at one scale may not be observable at another scale, and the function of natural and designed systems may change with scale. They use proportional relationships (e.g., speed as the ratio of distance traveled to time taken)...

Q: In our best spacecraft how long would it take us to get to the center of the milky way galaxy?

- a. 26,000 years*
- b. 26,000 light years*
- c. 225 million years*
- d. 225 million light years*

A.2 NGSS Core Disciplinary Ideas

LS2: Ecosystems Organisms and populations are dependent on their environmental interactions both with other living things and with nonliving factors, any of which can limit their growth. Competitive, predatory, and mutually beneficial interactions vary across ecosystems but the patterns are shared.

Q: Individual living thing....

- a. abiotic factor*
- b. organism*
- c. community*
- d. biotic factor*
- e. ecosystem*
- f. biome*
- g. population*

ESS2: Earth Systems Plate tectonics is the unifying theory that explains movements of rocks at

Earth's surface and geological history. Maps are used to display evidence of plate movement.

Q: Hypothesis that continents move over Earth's surface.

- a. plate tectonics*
- b. fossils*
- c. magnetite crystals*
- d. continental drift*
- e. Pangaea*
- f. magnetic field*

PS2: Motion and Stability The role of the mass of an object must be qualitatively accounted for in any change of motion due to the application of a force.

Q: Which of the following is an example of acceleration?

- a. a change in direction*
- b. an increase in speed*
- c. a decrease in speed*
- d. all of the above*