5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.			
PE Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. [Clarification Statement: 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.]	DCI • Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. • The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.	CCC • Systems and System Models - A system can be described in terms of its components and their interactions.	Practices Developing and Using Models – *Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.* Develop a model using an example to describe a scientific principle.
Activity Whole Class: Walk students through a hands-on simulation of ground motion and affects using the provided ground model manipulative. As the ground slides along a strike-slip fault, the ground shakes and rivers are diverted. As the ground slides down a normal faultline, cliffs and waterfalls are formed. As the ground slides against a reverse faultline, cliffs and lakes are formed. As plates diverge, volcanic activity and magma release is likely, affecting soil, air, and water quality. For help with these terms, see the USGS Visual Glossary.	Question How does the geosphere affect the biosphere, hydrosphere, and atmosphere?	Objectives / *Next Steps* • The geosphere can affect each of the other systems through seismic or volcanic actions as well as simple terrain shape (determining how water flows and where organisms can live). • The geosphere ultimately determines the chemical content of every other sphere. *What affect do the other spheres in turn have on the geosphere?*	Notes Feel free to dramatize the affects of earth motion, but also explain that large changes happen very slowly over long periods of time. Ground models are constructed using cut cardstock. Legal-sized templates are available.

Small Groups: Create a poster describing each of the spheres' affects on the others.	How do the biosphere, hydrosphere, and atmosphere affect the other spheres?	• The atmosphere is protective of life, and its weather and climate help to shape earth and water systems. • The hydrosphere fuels life, shapes land, and has a tremendous affect on the atmosphere's weather. • The biosphere often has the largest impact on the others, especially when humans are considered.	Poster template available in legal (8.5x14) and ledger (11x17) sizes.