THE STANDARD

Geoscience Processes

Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

DCI
DISCIPLINARY CORE IDEA

ESS2.A · Earth's Materials and Systems

> *The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future.*

Earth's surface is never sitting still. Water, wind, and ice break rock down and move the pieces. Volcanoes pile new rock on top. Plates grind into each other and shove up mountains. Some changes finish in minutes (a landslide). Some take millions of years (a canyon). **Same planet, vastly different speeds and sizes.**

SEP
SCIENCE & ENGINEERING PRACTICE

Constructing Explanations and Designing Solutions

> *Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.*

Students aren't memorizing a list of processes. They're constructing an explanation: here's the evidence, here's the process that fits it, here's why this process explains the change at this scale. The explanation is the deliverable. **If they can back it up with evidence, they're doing the science.**

CCC
CROSSCUTTING CONCEPT

Scale, Proportion, and Quantity

> *Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.*

Every geoscience process runs on a different clock and across a different distance. A landslide finishes in seconds across a hillside. The Himalayas keep rising about 5 mm a year across a continent. **Students learn to ask "how fast?" and "how big an area?" before they explain anything.**