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.

ANCHORING PHENOMENON

Mt. St. Helens, Before and After

May 17, 1980: Mt. St. Helens is a classic cone-shaped volcano in Washington. Snow-capped. Symmetrical. May 18, 1980, around 8:32 a.m.: the north face of the mountain collapses in the largest landslide in recorded history, and a lateral blast tears through the failing flank. The mountain loses 1,300 feet of summit in the first few minutes. The full eruption sequence continues for about nine hours, burying the landscape for miles around in ash and debris. Visible from space. Students will keep circling back to this all week.

> DRIVING QUESTION
>
> *"How can a mountain that took hundreds of thousands of years to build change so much in a single day?"*

INVESTIGATIVE 1

The Grand Canyon vs. the Mississippi Delta

Two photos. The Grand Canyon: a mile deep, layers of rock exposed, carved by the Colorado River over about 6 million years. The Mississippi Delta: a vast spread of new land at the mouth of the river, built up by sediment deposited over the same kinds of timescales. One river. Two opposite stories. One side carves rock away. The other side piles sediment up. Use this one to sharpen the lens the anchor is pushing on: same kind of process (water moving), wildly different outcomes depending on where you stand on the river.

> DRIVING QUESTION
>
> *"How can one river be tearing down a landscape in one place and building one up in another?"*

INVESTIGATIVE 2

A Sand Dune in Time-Lapse

A time-lapse video of a sand dune migrating across a desert. In real time, you'd never notice it. Sped up, the dune walks. Wind picks up grains on the windward side, carries them over the crest, and drops them on the leeward side. The whole dune slides forward, sometimes several meters a year. Same kind of slow-and-steady change as the anchor was hiding behind, except this one's running fast enough that time-lapse can catch it.

> DRIVING QUESTION
>
> *"If a dune can move that much in a year, what's it going to look like in a hundred years? In ten thousand?"*