THE STANDARD

Time Scale of Earth

Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

DCI — DISCIPLINARY CORE IDEA

ESS1.C · The History of Planet Earth

> *The geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.*

Earth is about 4.6 billion years old. That's a number so big it stops feeling real. The geologic time scale is how scientists make it usable. Rock layers stack up over time, with the oldest on the bottom and the youngest on top. Inside those layers, fossils mark which life forms were around when. **Together, the rocks and the fossils give us a timeline.**

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 eras. They're building an explanation: how do we know Earth is this old, and how do we know when major events happened? The evidence is in the strata. **A good explanation cites the layers, the fossils inside them, and the logic that connects what's deeper to what's older.**

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.*

4.6 billion years is unimaginable on its own. Students have to scale it down to something they can hold: one meter of rope for a billion years, or one football field for all of Earth's history. The scale shift is the whole point. Students can't experience deep time directly. **They reason about it through proportional models.**