THE STANDARD

Cycling of Water

Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

DCI — DISCIPLINARY CORE IDEA

ESS2.C · The Roles of Water in Earth's Surface Processes

> *Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. Global movements of water and its changes in form are propelled by sunlight and gravity.*

Water doesn't get used up. It moves. The same molecules cycle between ocean, atmosphere, land, and living things. The Sun heats water until it evaporates, and plants release water vapor through their leaves. Vapor rises, cools, and condenses into clouds. **Gravity pulls it back down as rain or snow, and then keeps pulling it across the land into rivers, lakes, and underground.**

SEP — SCIENCE & ENGINEERING PRACTICE

Developing and Using Models

> *Develop a model to describe unobservable mechanisms.*

Students aren't memorizing a six-step cycle diagram. They're building a model that shows where water goes, what state it's in at each stop, and what's making it move. The model has to make an invisible process visible. **If it can't explain why water moves, it's not done.**

CCC — CROSSCUTTING CONCEPT

Energy and Matter

> *Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter.*

The whole standard is matter cycling because energy flows. Sunlight is the energy that lifts water into the air. Gravity is the force that pulls it back down. Take either one away and the cycle stops. **Students should be able to point at any arrow in their model and say what's driving it.**