THE STANDARD

Matter Cycling & Energy Flow in Ecosystems

Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

DCI
DISCIPLINARY CORE IDEA

LS2.B · Cycle of Matter and Energy Transfer in Ecosystems

> *Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem.*

Two different things happen at the same time in every ecosystem. Matter (carbon, nitrogen, water) cycles between living and nonliving parts over and over. Energy flows one way, from the sun, into producers, into consumers, and out as heat at every step. **Food webs are the model that shows both.**

SEP
SCIENCE & ENGINEERING PRACTICE

Developing and Using Models

> *Develop a model to describe phenomena.*

Students aren't memorizing food chains. They're building a model that shows who eats whom, where atoms travel, and where energy is leaking out as heat. The model has to do work. **If it can't trace a carbon atom or show why the top of the pyramid is narrow, it isn't done yet.**

CCC
CROSSCUTTING CONCEPT

Energy and Matter

> *The transfer of energy can be tracked as energy flows through a natural system.*

Energy and matter behave differently in the same system. Energy enters as light, gets passed along food chains, and exits as heat. Matter doesn't exit. It cycles. The same carbon atom can be in a leaf, then a deer, then a fungus, then the soil, then back in the air. **Two patterns, one ecosystem.**