

THE STANDARD

Changes in Forms of Energy

"Apply scientific ideas to design, test, and refine a device that converts energy from one form to another."

DCI

DISCIPLINARY
CORE IDEA

PS3.B · Conservation of Energy and Energy Transfer

"Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy."

This is the build standard. 4th graders don't just talk about energy, they make a device that changes one kind into another. A battery's stored energy becomes motion in a fan, or light in a bulb, or sound in a buzzer. **The big science idea is that energy doesn't get created, it gets converted from one form to another.**

SEP

SCIENCE &
ENGINEERING
PRACTICE

Constructing Explanations and Designing Solutions

"Apply scientific ideas to solve design problems."

4th graders take a real science idea, that energy changes form, and use it to solve a building problem. When their circuit doesn't light up, they don't guess randomly. **They use what they know about energy and circuits to make a fix on purpose.**

CCC

CROSSCUTTING
CONCEPT

Energy and Matter

"Energy can be transferred in various ways and between objects."

Here's the idea students walk out with: energy can travel and change form. In a circuit, the battery's stored energy moves through the wires as electric current, then becomes light in the bulb or motion in the motor. **Same energy, just moved and changed into something new.**