

Looking Through the Energy Lens

A Proposed Learning Progression for Energy in Grades 3-5

We propose both a new framework for pre-college energy education and a detailed learning progression (LP) for Grades 3-5. We propose that energy education focus on how scientists use what we call the “Energy Lens” to examine a broad range of phenomena. The Grade 3-5 LP builds on students’ initial ideas about energy (the Lower Anchor), and teaches students to think of phenomena in terms of energy from the start. We identify a network of four interdependent foundational ideas (the Energy Quartet) that are central to a scientific understanding of energy, essential for an informed citizen, and can progressively and meaningfully evolve, with instruction, from their precursors in childhood to principles endorsed by scientists. Our proposed LP indicates how students’ understanding of each of the four ideas and the Energy Lens will broaden and deepen over the course of a three-year instructional sequence from Grades 3 to 5, preparing students for further instruction and learning in middle and high school. Classroom activities piloted with 3rd and 5th grade students show the promise of this approach to help students restructure their ideas about energy.