

Grade 7 Science & Engineering

Like all JK-8 units, the upper school learning experiences are driven by engaging phenomena that spark student questions and interest. Students are using science and engineering practices to figure out the phenomena as they build their understanding individually and with each other using all forms of literacy (reading, writing, talking and listening). Literacy connections are built into the units, as well as engineering and connections to professional scientists.

Unit	Description	Essential Questions
Introduction to Science	At every grade level (JK-8), Cambridge students begin the year exploring what science is, why science is important to them, who scientists are and what they do, and how they will use science notebooks to record their questions, observations, ideas and explanations throughout the year. These skills build over time as students move from grade to grade.	What is science? Why is it important to me? Who are scientists and what do they do? How and why do scientists use science notebooks?
Roller Coasters!	Using roller coasters as the phenomena, students figure out the relationships between motion, forces and energy. Specific topics include kinetic energy, potential energy, thermal energy transfer, conversion between different forms of energy to another, forces that act at a distance (electric, magnetic and gravitational), and Newton's laws.	How is energy transferred and conserved? How are forces related to energy?
Mysteries of the Universe	Building on the 5th grade astronomy unit, 7th graders dive more deeply into explaining astronomy concepts such as lunar phases, eclipses, why we have seasons, our place in the Milky Way galaxy, gravity and its impact on earth and in the solar system, and how we know what we do about the solar system (and how and why our thinking has changed over time).	How can we explain the patterns we observe in our solar system and beyond? How and why has our thinking about the universe changed over time?
Ecosystems	Students build on their prior learning of ecosystems to explore ecosystem dynamics in more detail using the Alewife Ecosystem as a learning lab. They investigate how animal and plant adaptations and behaviors increase successful reproduction, the effect of changes in resources on populations, the effect of environmental factors on organism growth, specific relationships between organisms in an ecosystem, the cycling of matter and energy in ecosystems, and designs for protecting ecosystems.	How and why do organisms interact with their environment and what are the effects of those interactions?