Grade 8 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
Climate Change in Cambridge	This unit introduces students to local climate data and climate change consequences and mitigations. They gain a foundational understanding of the atmosphere's composition and how heat moves. Students consider their own position as a stakeholder in local climate issues and strategies. They design and present a solution to the rising temperatures in Cambridge and evaluate the city's climate plan.	How is climate change affecting different parts of Cambridge? How does heat move within the city and the atmosphere? What can residents do to mitigate the effects of climate change?
Global Weather	Students analyze data to make claims about climate using critical thinking skills. They study weather and can explain how it differs from climate data, and explore the diverse interactions of energy on Earth (including the impact of the oceans on weather and climate). Students also investigate human activities and how they might contribute to climate change (based on data). In conjunction with their study of climate change, students learn the complex interactions that are occurring on our Earth.	Is Earth's climate changing? How do we know? How does climate change impact living things? What can we do to help?
Why is Life on Earth So Diverse?	In this deep exploration of evolution, genetics and heredity, students investigate changes in life forms throughout Earth's history and compare fossil and living organisms to try to explain why these changes have occurred. Then they investigate how the characteristics of one generation are passed to the next and how this drives the changes in living things throughout Earth's history. They study the roles of chromosomes and genes, genetic factors, natural selection, mutations, asexual reproduction, and use models to explain how characteristics are handed down to offspring.	How can there be so many similarities among organisms yet so many different kinds of plants, animals and microorganisms? How and why have living things changed over Earth's history? How are the characteristics of one generation passed to the next?

		How can individuals of the same species and even siblings have different characteristics?
Chemistry	This unit aims to provide students with a deep understanding of how matter is composed and transformed through chemical reactions. Through hands-on activities and experiments, students will develop and use scientific models to describe atomic combinations, analyze chemical reactions and understand energy changes during these reactions.	How is matter organized? What happens in a chemical reaction? How is matter conserved?