All about Automata
We all love chain reactions. Whether it’s “giving a mouse a cookie,” foiling the bad guys in the movie *Home Alone*, or having breakfast with Caractacus Pott in *Chitty Chitty Bang Bang*, we are forever amused when Thing A bumps into Device B and forces Item C into motion. While Rube Goldberg made bizarre, theoretical chain reactions famous in the early 1900s, recent artists like the band OK Go and animator Nick Park (*Wallace and Gromit*) have taken the art to a new level. During this course, students will become expert engineers, Rube Goldberg designers, and kinetic artists by manipulating common materials like cardboard, tape, hangers, nuts and bolts, washers, and string to create both simple and complicated contraptions. Take this course to get in on automata action!

The Curious Case of Poe: A Course in Detective Fiction
Whose spooky stories and poems inspired a new genre of literature? Edgar Allan Poe. Through his scary stories, as well as his poems, he changed the way we read and think about the world entirely. In this course, we will become literary scholars and detectives in our own right; by exploring Poe’s writing, and visiting his local haunts, we will discover how his writing changed the way we read and write today. We will also act as detectives ourselves by writing and solving our own mysteries. In this course, we will examine both Poe’s works and those of his successors, such as the Sherlock Holmes stories by Sir Arthur Conan Doyle, Agatha Christie’s detective novels, and how certain themes have come to be featured in horror films as well, such as those directed by Alfred Hitchcock. Part of the course may involve writing our own mystery stories in groups, and attempting to solve one another’s by investigating and through clues.

Disease Detectives
Understanding how diseases are transmitted, lead to illness, and are cured is the cornerstone of medical science. We will explore a variety of pathogenic organisms by examining their life cycles and transmission from host to host to learn why some pathogens result in epidemics. This course acts as an introduction to basic microbiology, as students engage with topics like vaccine development, epidemic and pandemic pathogens like influenza, HIV/AIDS, Black Plague, smallpox, and more. Take this class if you are interested in diving into the exciting microscopic world of infectious diseases!
**Evolution: The History of an Idea**
In this course, we will take a closer look at the discoveries, ideas, and scientists contributing to Charles Darwin's theory of evolution by natural selection. For each contribution we explore, students will be provided with the historical information and evidence used to develop the theory and challenged to develop their own conclusions, which they will then compare and contrast to the actual theory. Students will interact with original documents, statements, and drawings by the scientist(s) who developed the theory at this stage. The course will conclude with a discussion of how many theories over hundreds of years were needed and combined to produce Darwin's theory of evolution by natural selection and a potential answer to the question “Can Charles Darwin rightfully be called “The Father of Evolution?””

**The History of Music: An Exploration of Sound**
Do you have a favorite genre of music? Have you ever wondered why you are drawn to it? Or what processes were created that allowed those sounds to happen? Have you ever considered what your grandparents listened to while growing up, or their grandparents, and the many generations before? For this course, we will answer these questions as we explore the history of music since the dawn of humanity! We will listen to a variety of music including Beethoven, The Beatles, African BaAka music, and much more. Along the way we will apply what we have learned through fun and engaging activities like writing classical music on parchment, playing complex rhythms on drums, conducting debates on what makes an awesome tune, and composing a pop song. If you’re a student who wants to study music that challenged listeners and allowed different genres to flourish, to better understand why some tunes just sound so good or so bad, or to get inside the head of musicians and composers, then this class is for you!

"Making" History: Creating Connections to the Past
Why should we care about the past? How did technology impact the past and the present? This course examines these questions and seeks to answer them by discovering past technological advancements and their significance and connections within the ancient, middle, and modern historical eras. Instead of just looking at these past events/technological advancements, why not recreate them? Students in this course will not only become historians, but also makers. They will investigate the different design processes through a STEAM approach. Each day, students will discover and investigate an historical event and then make something related to that event—in other words, you will be "making" history!

**The Science and Policy of Sustainable Energy**
Nearly everything we do in modern society requires energy. Access to relatively cheap energy has enabled untold advances in technology and standards of living in the developed, and increasingly, the developing world. However, we have also seen increases in the likelihood of extreme weather events (e.g., flooding, drought, and hurricanes) and environmental risks and consequences (e.g., deforestation and air/water contamination). Why don't we just wave a magic wand and make everything clean and green? What are the consequences of (not) changing our ways? In this course, students will learn about key scientific concepts underlying the issue of sustainable energy and how to apply these concepts to better understand and analyze economic and policy decisions. Students will gain exposure to science and policy concepts used by the EPA and the U.N. and learn how best to apply the science they learn in the classroom to make the world a better, more sustainable place.

**Through the Physicist’s Looking Glass: The Physics of Everyday Life**
The world around us is made from and operates according to the laws of physics. Yet most of us go through our daily lives without even batting an eye about how physics makes this world possible. We KNOW that cars work, airplanes fly, and glasses improve our vision, but often fail to ask "HOW?" Below this surface is a treasure trove of exciting physics that can be used to view the world in a new and fascinating light! In this class, we will be looking at how the world around us works through the eyes of a physicist. Many activities, from water balloon toss contests to studies of car crashes, will help us to understand the mysteries of the world we live in.