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Biomimicry  
Ms. Cass, Dr. Lancaster  
Grades 6, 7, 8

Mother nature is remarkable in that for every conceivable problem, there seems to be a solution. Humans have been inspired by nature for centuries, and we mimic natural solutions to help us with our world’s difficult problems. Certain desert plants release chemicals to stop other plants from growing too close and stealing their water. A new antimicrobial material to be used in hospitals was discovered by studying the micro-topography of sharkskin. Students will study unusual plants and animals to figure out which of today’s problems nature can help us solve. They will explore the engineering behind these solutions, creating scale models and conducting labs to illustrate the physics. Students will travel to iFLY’s unique wind tunnel and immerse themselves in concepts, including parachute parameters, aerodynamics, terminal velocity, forces, proportional relationships, drag and variability. Incorporating these principles, students will design solutions to current problems and ultimately submit them to the national biomimicry youth challenge competition.

Women in Greek and Roman Mythology  
Mrs. Keshishian, Mrs. Zemaitis  
Grades 6, 7, 8

What do Disney heroines, like Princess Aurora, and Harry Potter characters, like Minerva McGonagall, have in common? These fictional modern women have roots in Greek and Roman mythology. Rick Riordan’s beloved series about Percy Jackson focuses on Zeus, Poseidon and other ancient male gods. Students who love mythology and especially learning about Athena, Hera, Artemis and other strong mythological goddesses will enjoy this journey into the ancient world. They will also read modern stories and watch movies to make connections between modern female characters and the Greek and Roman heroines who influenced their creation. The class will travel off campus to explore mythological artifacts at the Penn Museum and the Philadelphia Art Museum. Students will become explorers, teachers, debaters, researchers and artists, ultimately find a way to showcase their learning about women in Greek and Roman mythology.
The Physics of Musical Instruments
Ms. Harlamova, Mr. Phillips
Grades 6, 7, 8

Have you ever wondered why musical instruments can make the sounds that they do? Students will explore, design, innovate and perform, as they investigate the physics behind musical instruments. The class will travel to see live piano making in action at Cunningham Piano Factory in Germantown. They will visit Kot’s Violin Shop in Bryn Mawr and see how violins are constructed and repaired. Students will have the chance to drop in on a Philadelphia Orchestra rehearsal and meet the professional musicians who bring classical music to life. They will discover the methods by which pitch-creating musical instruments produce sound, and then utilize those discoveries to further investigate how the pitches of those sounds change. Armed with this knowledge, students will build their own orchestra, tune their instruments and compose, conduct and perform their own music.

Feminism and the Modern Middle Schooler
Mrs. Addis, Ms. Doherty
Grades 6, 7, 8

What does feminism mean to you? What is your place in women’s history? Although students are encouraged at Baldwin to believe that equal opportunities await outside our gates, the modern world is slow to catch up. This course will celebrate triumphs for women’s rights and dig deeper into the challenges that still remain, including workplace inequalities, women’s health and access to education. Students will be exposed to a variety of resources to think critically about the evolution of the feminist message and understand the context for many of today’s struggles. Wandering the streets of Old City Philadelphia, the stacks at the Free Library and exhibits at local museums, students will have a chance to explore the meaning of feminism as it has evolved over the 20th and 21st centuries. Ultimately, students will choose their own contemporary women’s rights issue to investigate and develop a campaign strategy to promote their position.
The Art of Geometry
Ms. Konopka, Mr. Campbell, Mr. Potten
Grades 6, 7, 8, 9

“Geometry is the right foundation of all painting” -German artist Albrecht Dürer
A connection between mathematics and art can be found in every culture. Using a compass and straightedge, students will explore methodologies of the ancient Greeks to produce exact shapes and the golden spiral. Having practiced producing these forms, they then will incorporate geometric shapes into their artwork. They will also learn to analyze and sketch linear perspective art. Through the interactive math program Desmos, students will design and create art using graphs and different mathematical functions. This is a mathematical form of coding or computer science. They will be challenged to use geometric principles and their imagination to create faces, animals, cars or optical illusions. Students will explore the different ways in which art and math intersect, culminating in a student-curated educational art exhibit.

To Be or Not To Be… Poisoned
Ms. Epstein, Ms. Wiley
Grades 8 & 12

Modern science or ancient alchemy? William Shakespeare incorporates love potions, sleeping potions and poisons as significant plot points in several of his plays. Students will use basic chemistry either to prove the potency of these poisons or to alter the play using knowledge of modern medicines and toxicology. Student-scientists will work with a modern apothecary (an old-fashioned pharmacist) to create a tincture, visit a medicinal garden, learn from a doctor and perform labs to test the toxicity of modern pollutants. Student-actresses will train with an actor from the Shakespeare Theater and then rewrite, design and perform a modern adaptation of a Shakespearean play to dramatize the scientific effects that poisons and potions have on the human body.
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The Chemistry of Jewelry
Mrs. Davis, Ms. Ramchandani
Grades 10, 11, 12

Have you ever wondered about the chemistry behind metalsmithing and jewelry-making? In this course students will consider how science can influence their choices in the jewelry design process. Students will learn or review how to use the equipment in the jewelry studio, while discussing topics like malleability of metals, alloys, crystal structures, and chemical reactions. The class will have the opportunity to visit artists’ studios and jewelry shops in downtown Philadelphia to see how the process of using chemistry connects to jewelry-making in the real world. Ultimately, students will enhance their craft by studying the science as they make one-of-a-kind rings, bracelets and necklaces.

Prerequisites: Students must have taken Art 1 and taken or be currently enrolled in Chemistry.
Design and Build a Greenhouse  
Dr. Greeney, Mrs. Lee, Mr. Lillholt  
Grades 9, 10, 11, 12

What if we wanted to grow our own vegetables and flowers? What would it take to keep them blooming through the seasons? How hard is it to build and maintain a greenhouse? Can this be done with an eye to sustainability? Students will design and construct a greenhouse in the Baldwin Community Garden using new and recycled materials. To inform their designs, they will explore the 600-year global history of greenhouses, looking at examples of structures from 1450s Korea, 1750s France, 1850s Philadelphia and today. In order to build the most structurally sound greenhouse, students will learn the math behind the structures they are designing (parabola, volume, etc.). They will gain hands-on experience working with power tools, assessing the ecological impact of design choices and collaborating on a three-dimensional design-build. We will end the session by planting flowers in our new greenhouse, aiming to cut and share them at end-of-school-year celebrations, like prom and graduation.

Prerequisite: Students must have taken Geometry or must be currently enrolled in the class.

Freaks & Greeks  
Mrs. Friedman-Way, Ms. Vogel, Mr. Warfel  
Grades 9, 10, 11, 12

“I’ll tell you a secret. Something they don’t teach you in your temple. The gods envy us.” -Achilles

How can we use performance to connect a modern audience to the mythology of Ancient Greece? After exploring Greek mythology and drama, students will select a myth that resonates with them and create an original performance piece based on their own interpretations. Students will have guidance from a range of local theater experts, in-house and “in the field,” in addition to a trip to the Penn Museum of Archaeology and Anthropology. Whether they produce a full play or a one-act, musical or short film, students will take ownership of each part of their production, from scriptwriting to set building, designing costumes and choreography. Their production will incorporate the main themes, characters and spirit of the original myth, while keeping in mind today’s cultural climate. The performances will be filmed for wider community presentation.
“I Think, Therefore I Am”
Mme. Mariette, Ms. Schmalzried
Grades 10, 11, 12

“I would have women participate in all human rights, especially those of the mind”
- Émilie du Châtelet
Students will investigate the contributions of several French mathematicians and philosophers, using geometry software, three-dimensional models and soap bubble manifestations. Descartes and Pascal combined mathematics and philosophy in a formulation that reappears later in Le Petit Prince. Du Châtelet partnered with philosopher Voltaire. The contributions of Sophie Germain (“There are no differences between the sciences and the humanities”) and Évariste Galois were very much affected by the revolutions in France. Is there still room for collaboration between the humanities and the STEM fields? A recent Baldwin alumna will share her experiences as a PPE (Philosophy, Politics and Economics) major at the University of Pennsylvania. We will visit the Barnes Foundation to see how Cubism entered the arts in France. Students will work to create artwork or videos highlighting the interdependence between academic disciplines.

Prerequisites: French recommended but not required.

Haters Gonna’ Hate?
Ms. Faszczyk, Ms. Hagon-Kerr, Mr. Williamson
Grades 9, 10, 11, 12

Why do human beings hate? Do music and language contribute to or combat hatred? Students will pick a situation in which hatred tears at the fabric of human connection. Using Spanish and music as their primary superpowers, students will find a solution that promises to repair and reinforce the quality of that connection. They will study the rhythms of songs in Spanish and examine the undertones of the cultures from which those songs come, as revealed in the music. Students will analyze the significance of word choice, genre, dance movements and other expressive mediums to take a closer look at examples of the “why” behind hatred, and what forces serve to contribute to or combat it. They will take on the role of linguist, musicologist, film director, dancer and editor to work to create a culminating project of their choosing that exemplifies their findings, ideally while gaining some fluency in both music and Spanish.

Prerequisites: Spanish recommended but not required.
UPPER SCHOOL

Immigration
Ms. Malloy, Sra. Sacerio
Grades 10, 11, 12

What are the stories of today’s immigrants? Within the Baldwin community, there are a number of told and untold immigrant stories. What compels a person to leave their native land and embark on an often-perilous journey? Immigrants face a number of obstacles, including discrimination, unemployment and underemployment, lack of education, housing, food and language ability. This class will bring a greater understanding to the topic of immigration, with a strong focus on immigrants coming from Mexico, Central and South America. Students will read immigrant stories in Spanish or English and visit an agency in Philadelphia that works with immigrant communities. They will have the opportunity to interview family or community members who have immigrated to the United States and create reflections on what they learn.

Tell Me a Story to Change the World
Dr. Forste-Grupp, Ms. Gold
Grades 9, 10, 11, 12

Most of us have grown up with fairy tales. We have had them read to us. We have seen them told through movies, plays and ballets. Why do we continue to revisit these stories, especially in today’s complex world? How can we use these stories to change our vision of ourselves and our future? Students will discuss how fairy tales blend imagination and reality to create a new way of looking into our contemporary world and what it could become. After learning about the components of fairy tales and how they can be combined and recombined to create new stories, students will craft their own fairy tales in response to a current issue that they have researched. Students will have a chance to work with a Baldwin alumna who will teach them how to cut paper images. They will produce artistic representations of their stories using a variety of materials and techniques and might choose to create shadow puppets, accordion books or murals.
Daring Eaters and Readers  
Ms. Ameisen, Dr. Sullivan  
Grades 10, 11, 12

Do you remember the first time Harry Potter encountered pumpkin juice and chocolate frogs? Would you have gobbled up Bertie Bott’s Every Flavor Beans or feared to try them? Students will explore how food serves as a metaphorical and literal means of telling stories, sharing cultural histories and connecting cultural identities. Through the lenses of English and anthropology, students will explore how particular foods help us explore cultural identity, cross-cultural connections and aesthetic expression. Students will eat, cook and think about the relationship between food and culture. In addition to our readings and films, field trips to restaurants and food markets in the Philadelphia region will enrich our learning. The culminating experience will include a communal project and meal designed by the group.

*Note: This course will be most enjoyable for students willing to try a wide variety of foods.*

Maps, Math and Democracy  
Dr. Biss, Ms. Farella, Mr. Kountz  
Grades 10, 11, 12

Does your vote count? It depends on where you live. You may have been “packed,” “cracked” or “split” without even knowing it. Because of these gerrymandering techniques, the Pennsylvania Supreme Court recently ruled the state’s 2011 congressional district maps unconstitutional. This year, Pennsylvania will once again redraw its political maps. Students will have an opportunity to participate directly in this process as engaged citizens and determine what they value most in the democratic process. Students will explore topics related to gerrymandering, including congressional apportionment, redistricting and partisan politics with specific reference to Pennsylvania. The course will include guest speakers and will culminate in a field trip to the state capitol in Harrisburg, where students will present their maps to their elected representatives. Using state-of-the-art mapping software, students will apply mathematical models and analyze demographics to create their own 2020 Pennsylvania Congressional maps that will be entered in a state-wide contest for high school students.
UPPER SCHOOL

Monkey Business
Dr. Boger, Mrs. Reed
Grades 11, 12

“To suppose that the eye… could have been formed by natural selection, seems, I freely confess, absurd in the highest possible degree” –Charles Darwin, 1859
This course explores Charles Darwin’s theory of evolution and what made its publication a watershed moment in science, religion and human society. After an introduction to the theory and why it was so provocative, students will explore examples of microevolution, the application of Darwin’s theories to human society by social Darwinists and cultural reasons for resistance to scientific findings. Students will examine the genetic relatedness between humans and primates, observe monkeys, gorillas and orangutans in the Primate Reserve at the Philadelphia Zoo and hear from a visiting scholar about his interdisciplinary work with chimpanzees. Ultimately, students will develop an online museum exhibit, a web-based teaching module or a TedEd video miniseries, which addresses a question such as “Are humans still evolving?” or “How can one speak meaningfully across divides between those who embrace science and those who resist it?”

Gaming to Learn
Dr. Lui, Ms. Loke
Grades 9, 10, 11, 12

“Gamification” is the process of bringing game-playing elements, such as scoring, competition and play into non-game environments. Students will consider how gamification can be used to teach essential math concepts to Lower and Middle School Baldwin students. The goal is to have student teams create different kinds of games, whether digital or physical, for the purpose of helping teachers support students in understanding difficult mathematical ideas. Students will be involved in the engineering design process. This includes interviewing teachers to understand the needs they have in the classroom and surveying students to understand what excites them. Students will hear from professional game designers on how they work collaboratively on designing effective games for learning and enjoyment. They will work toward prototyping a pilot game that they will play-test with other members of the workshop. The class will culminate in a marketing presentation to students and faculty, and the final delivery of students’ game.
The Age of the App
Dr. Blankenship, Dr. Bunn, Ms. Nardelli
Grades 9, 10, 11

Tried to talk to someone staring blankly into their phone? Concerned about hate speech on your social media feed? Worried Alexa might be spying on you at home? This course delves into the ways that the internet has transformed society for the better and worse. Students will explore current debates about technology and society, including the scope of free speech and censorship online, the role of personal privacy and the prevalence of surveillance online and the ways in which digital communication has shaped personal and collective identity. Students will identify areas of personal interest and conduct guided research to learn more. The class will travel to the University of Pennsylvania to interact with on-campus exhibits and hear from experts in the field and visit a Philly-area tech company to understand industry perspectives. Building on this research and exploration, students will produce work that analyzes the social or political effect of technology and propose ways to address it.

Voices for Change
Ms. Lopez-Carickhoff, Dr. Senior
Grades 10, 11

What matters to you? How can you effect change in a way that is compelling and reflective of who you are? Students will consider the value of self-expression through their own assertions and those of others. In their effort to inform and persuade, students will use real-world data to make points about what matters most to them. Students will travel to Philadelphia to explore street art as a mode of representation and consider other impactful expressions of our right to free speech. They will work with a professional journalist and an expert in data collection, and representation and use digital design software appropriate to their needs. They will produce articles, podcasts, graphics, cartoons or other forms of journalism, bringing together writing, statistical analysis and design elements. Students’ experiences will feed back into the fields of activism, graphic arts, journalism and data science.
The Math and Science of Music  
Ms. Ballantine Erb, Dr. Goldader, Dr. O’Connor  
Grades 9, 10, 11, 12

How are sound waves created and perceived as music? This course explores the mathematics and physics of waves, as we work to understand the sound waves we call music. What are waves, how are they described and what properties are shared by all waves? What is the mathematical explanation of timbre, the character that distinguishes unique instrumental sounds? Students will learn about Western musical scales and instruments, and also explore world music, ranging from Mongolian heavy metal to the Australian didgeridoo. They will visit Bryn Mawr Presbyterian Church’s pipe organ for a guided tour and demonstration. Students will learn to play a tune on an instrument they create or explore how instruments they already play actually produce sound. They will share what they have learned by making a video that demonstrates the musical variations made possible by using different instruments alone and in harmony.

The Art of Failure  
Mr. Delio, Ms. Greco, Ms. Awal-Beirne  
Grades 10, 11, 12

This is a course about the other F-word. Students will participate in activities, reading and discussion, creative games and exercises to generate ideas, along with exploring multimodal art-making. Students will create a real-world product, such as a site-specific art installation, collaborative exhibition or individual pop-up artwork, that will take viewers on a journey through an immersive experience. This project, designed and executed by students and for students, will tell their own personal stories of “failure,” using both visual and literary tools. However, the emphasis will not be on the technical crafting of a “perfect” finished product but on the individual and collective art, from research and idea generation through a final public display for the Baldwin community.
“Des mots pour regarder” (Some Words for Looking)
Mme. Seliverstoff, Ms. Wilke
Grades 9, 10, 11, 12

How is it possible that a single art exhibition affected “how we see” today? Yet an exhibition in Paris in 1863, the “Salon des Refusés,” did just that. Among those exhibiting were Manet, Monet, Pissarro, Whistler and Cezanne. Students will engage with two iconic art movements, Impressionism and Post-Impressionism. Students will immerse themselves in the time period, imaginatively experiencing the life of a painter, critic, collector, or curator of an exhibition. They will try their hand at oil painting on canvas in the style of these artists. They will also explore how the French language shaped the painters’ artistic vision. Students will travel to the Barnes Foundation to see Impressionist and Post-Impressionist work and experience firsthand the global impact of the relationship between a Philadelphia art collector and a small group of French painters. Ultimately, students will adopt roles from the Impressionist and Post-Impressionist art world and stage an exhibition.

Prerequisites: French recommended but not required