

Summer 2021 Gifted and Talented Program Curriculum

Week I: June 21–25

Grades 2–4

Fun with Fibonacci, Sudoku, and Such!

Discover the complex beauty behind the Fibonacci sequence, and realize just how much this beautifully intriguing sequence can be found throughout nature and everywhere around us! Students will become familiar with Fibonacci numbers and develop brain power with the benefits of math-based games, cooperative and independent math activities, as well as math related stories and artwork. Students in this class will discover the fun in recognizing how Fibonacci numbers relate to our everyday world and the relevance of math operations to these specific numbers in a variety of math-based games, including Sudoku, Rubik's Cube, and the math games invented in class!

Word Power Challenge

Students in Word Power Challenge engage in friendly competition, build their vocabularies and spelling skills, and learn to play word games such as Scrabble, Boggle, Word Thief, Scattergories, Password, Blurt, Dictionary Dabble and more! Incorporating daily vocabulary words of the day, Greek and Latin roots, interactive class activities such as word games, explorations in neologism, and relevant film selections, students in this class will develop notable strength in word power as they finesse their way to the top, and win their high-spirited competitions with endlessly impressive words!

Grades 5–7

Scream Machine: The Need for Speed

Roller Coasters are an exhilarating ride for people of all ages. Thrill-seekers will get their adrenaline pumping through hands-on, engineering activities to learn the physics behind a roller coaster. Using algebraic skills, students will calculate speed, as well as learn about kinetic and potential energy at work to give riders that rush! Students will examine roller coasters through simulations, ultimately building their own coaster that any of their friends would travel for miles to enjoy.

SketchUp Architecture

SketchUp is a simulation 3D modeling program in which students utilize the archetype of the house to learn how to build virtual 3D models. Running parallel to the 3D modeling will be the investigation into the “golden” ratio as it is applied to an angle, rectangle and its incorporation in historical and contemporary designs throughout the world, as well as its practical uses in modern architecture. This visual proportion is based on the Fibonacci sequence and will be investigated as a 3D form, giving framework in the students' model building exercises. Moving through a series of virtual model building exercises in a condensed fashion, students develop their SketchUp “legs” as they familiarize themselves with the simulation software. This will lead to the eventual exploration and incorporation of the concept of the Golden Ratio to apply to virtually constructed objects. The concept of appropriate SCALE in the students' model building will be a consistent theme throughout the week of virtual modeling. A basic vocabulary of residential and collegiate building parts will be shared throughout the week as well.

Grades 7–9

Lab Science: Chemistry

This course will take an inquiry-based approach to foster students' curiosity and other scientific attitudes toward lab sciences. Students will build skills in the areas of making observations, planning the best approach to solving problems, developing focus questions, interpreting complex data, and communicating what they learned in reflective writing. This will afford students the opportunity to become more interested and confident in using higher-order thinking, to explore, test, and make their own conclusions about various aspects of science in general, and in Chemistry, specifically.

Justice League: Decoding the Superhero(ine)

In this research-based writing course, students will explore the history of the Superhero through the ages. Students will conduct in depth studies of the Superhero archetype, purpose, backstory, origin, etc., while learning about the rise of the superhero in the 20th century and following the archetype as it evolves and mirrors American history (World War II, Civil Wars, The Civil Rights Movement, Watergate, Social Injustice, and crime). Students will study the hero and the villain as patriarchal figures, along with the matriarchal figures and lack thereof. Students will ultimately create their own Superhero(ine) and write a backstory of their character.

Week 2: June 28–July 2

Grades 2–4

Advertising Agents

In this creative thinking and artistically driven course, students learn the process of advertising through television commercials, magazine print ads, outdoor billboards, as well as the relevance behind product placement. Students will work collaboratively in advertising teams as they create a complete advertising campaign for an existing, discontinued, or mock product of their choice. Advertising teams hold specific roles such as Creative Director, Art Director, Storyboard Artist, and Copywriter. Lastly, advertising teams will pitch their commercial campaigns and spotlight their work at the end of the week.

Aerodynamics: 3, 2, 1, Blast Off!

Ever wonder what makes an airplane fly? Or why boats, even the really big ones, don't sink? In this class, students will examine the scientific principles behind aerodynamics and hydrodynamics, including Newton's Laws of Motion, weight vs. mass, density, thrust, and air pressure through hands-on experiments and discovery. Students will apply these concepts to the design and building of their own rockets. We launch at the end of the week!

Grades 5–7

Physics & Engineering: Building Bridges

Do you like building things? Do you want to learn how to build them better? Students who enroll in this high energy engineering course will learn about the physics of forces and machines, and discover ways to improve their engineering skills and develop into better engineers, no matter what they are building, or what materials they use to build! This course covers various branches of engineering, as well as concepts in forces, friction, and simple machines. Students in Physics and Engineering: Building Bridges work independently as well as in teams, and ultimately compete with their like-minded peer groups to build the tallest, strongest, and most efficient structures employing the principles, concepts, formulas, and laws of physics covered throughout class.

Game Theory

In this math based class, students will examine how the elements of game theory interact to determine which games are fun, which are boring, and which make us want to flip the board! Through hands-on discovery, students will learn about collective behavior, rational and irrational decision making, cooperation vs. competition, patterns, systems, and the role of *chaos*. Students will use their learning to create their own games, which are bound to make their next family game night a theoretical hit!

Grades 7–9

Lab Science: Genetics

This hands-on lab science-based genetics class is currently under construction and pending full course description by Mr. Adjokatcher. Thank you in advance for your patience and understanding!

Artful Wonders

This course is designed for students who want to learn more about the art Wonders of our world. Students in this class will learn about different people around the world with a focus on the art of each particular culture. Many cultures around the world create masks for ceremonies, for theater, for puppet shows or to connect with their ancestors. Students will explore topics such as the gold masks of the ancient Incas or the jungles of the Mayan rainforest where buried jade masks have been found. Students will learn about the art and cultures of the ancient world to connect with art history and consider how designs reflect cultural beliefs. Based on each culture we explore, students will create works of art in a hands-on studio style environment.

Week 3: July 12–16

Grades 2–4

Animation Creation!

It's something we can all agree on—Pixar movies are consistently awesome. All it takes is an idea, and from there, kids can create their own characters, worlds, and stories! In this class, modeled after the Pixar Animation Studios Pipeline, students will follow the process through brainstorming, storyboarding, modeling, rigging, set design, animation, and lighting to create their own stop-action short films.

Calling All Artists

Develop your drawing, painting, and sculpture skills while examining the methods of master artists such as Claude Monet, Georgia O'Keefe, Alexander Calder and more! Learn and apply technical drawing, painting, and sculptural methods used by artists to create masterful artistic visual effects and images in this hands-on art course. Students in this class will strengthen their knowledge and abilities in artistic technique and design, as well as cultivate and nurture their creative intelligence.

Grades 5–7

Architecture: How Buildings Stand

Students in this interdisciplinary class will use math, physics experiments and architectural design techniques to prove the basic building principles of architecture. Students will have the hands-on opportunities to design their own dream homes to scale, and also calculate the actual costs involved. The class will also explore the rise of the

Chicago skyscraper as well as local architectural styles, such as F.L. Wright, taking full advantage of the wealth of examples that fill the city and its surrounding neighborhoods.

Stick to the Script: Introduction to Screenwriting

In this exploratory and writing intensive course, students will be introduced to the wonderful art of screenwriting. Students will transform an original story idea from pitch to story to treatment, and finally to screenplay or script. As budding screenwriters, students in this class will develop their traditional notebook stories into structural detailed works suitable for a film-short. They will learn screenwriter's language such as plot, scene development, dialogue, conflict and conflict resolution, the three-act film, and character development. The stages of screenwriting will come to fruition as students gain an understanding of what makes a story better, and how it all begins with a basic screenwriting format.

Grades 7–9

Astrophysics

Do you stand in awe of the stars at night, imagining what wonders could be out there so distant in the cosmos? The universe is a very big place, but is it infinite? What strange and amazing things can be found in our solar system, in our galaxy, and beyond? What would it take to visit these places, and are there things worth visiting "in our own backyard?"

Students will learn about how planets work, how to find them around other stars, and how we think they form. We will learn about the life cycle of stars and why the cycle happens this way, including favorites like black holes, nebulae and supernovae. Mathematics skills will not be necessary, but students seeking a challenge can be provided one! The physics equations governing the motions of planets, such as with velocity, acceleration, force, and universal gravitation will be offered.

Young Adult Book Club

In writing novels, memoirs, short stories and more, an author may combine both factual information about the time, place, events and real people with fictional characters, dialogue and details. Young Adult Book Club students will explore, practice, and develop their literary techniques as they read, examine, and discuss several forms of writing as well as sample-read young adult authors who possess unique and exemplary writing styles and voice. In this reading and writing intensive literary analysis course, young adult authors share their favorite written pieces, and thoughtfully offer critique or even revision to reimagine or explore a new storyline.

Week 4: July 19–23

Grades 2–4

Chemical Reactions

Are you curious and enjoy making messy mixtures at home? Have you ever wondered why some of your concoctions fizz or even get warm while others change color or get cold to the touch? If you answered yes to these questions, then let's explore the science behind chemical reactions!

The Number Devil

The Number Devil is a book about Robert, a boy who discovers the amazing world of numbers, including infinite numbers, prime numbers, and Fibonacci numbers. *The Number Devil's* visualizations of these higher-level math

concepts offer a starting point for math projects in drawing, painting, construction and dramatic play. Join us in the rollicking dream world of the Number Devil, where the sky is the infinite limit!

Grades 5–7

Physics and Engineering: Rocket Science

Model rockets are a great way to get outdoors and have fun with physics. This course focuses on learning how rockets work, and how to determine how high their rockets fly using physics. We will discuss tips to optimize a rocket against things like air resistance drag, and practice rocket launch safety. Using shortcuts of advanced physics equations will help us to determine maximum altitude and find the winner of our rocket contest!

Rubik's Cube

Can you solve a Rubik's cube? This class will teach you everything you need to know to succeed. Whether you are brand new to cubing or eager to enter a competition, this practice intensive week will help you take your skills to the next level. As we learn to solve the cube, we will also discover the history behind its invention, how it became a global competitive phenomenon, the importance of algorithms to modern life, and how to broadly apply the critical thinking skills that cubing teaches us.

Grades 7–9

Exploring Photojournalism

In this visually driven course, students will learn about the importance of photojournalism and the effectiveness of telling a story visually. Students will explore photos from The Great Depression and Civil Rights, to sports and world news. Each student will take a series of photographs, of which they will select five, and write short passages and editorials telling a story. Students will learn to understand the difference between "paparazzi" pictures of celebrities, and journalistic photographs that document emotion, culture, history and time. Note: This course will NOT instruct in photography or how to use a camera. Students will need a digital camera during this course week so images can be uploaded and printed.

Freedom Writers

This literary analysis intensive course will include both fiction and non-fiction. Students will identify a social justice issue and explore how it is reflected in different forms of art and literature, as well as how the issue has evolved from the past to the present. Inspired by mentor texts and community leaders, students will have ample time in class to not only respond to existing work on their chosen subject but also create their own. Every voice is heard and welcomed at this collective table of Freedom Writers!