

## 2023 COURSE DESCRIPTIONS

### Summer Academic Day Camp

#### PreK - Grade 6

Half-day morning, Half-day afternoon, and All-day courses available

CTD Day Camps for PreK – Grade 6 provide academically advanced concepts in fun yet challenging ways. Each course offers students a chance to create, build, imagine, and be academically challenged in ways that they may never have experienced in other settings. We recommend that your child choose classes that spark their interest and excitement. Students should select courses based on the grade they will enter in fall of 2023, however when parents complete applications in [MyCTD](#), they will indicate the grade in which their student is presently enrolled at the time of the application.

<b>Tuition</b> <ul style="list-style-type: none"> <li>• Half-day: \$365</li> <li>• One-Week All-day: \$700</li> <li>• Two-Week All-day: \$1,500</li> </ul>	
<b>One-Week Courses, PreK – Gr. 5</b> PreK - K: A.M. & P.M. Grades 1 - 5: All Day  <b>Program Dates</b> June 26 - 30 July 10 - 14 July 17 - 21 July 24 - 28 July 31 - Aug 4	<b>Two-Week Courses, Gr. 5-6</b> All Day  <b>Program Dates</b> July 10 - 21 July 24 - Aug 4
<b>Times</b> A.M. 9 a.m. - 12 noon P.M. 1 p.m.- 4 p.m. All-Day 9 a.m.- 4 p.m.  For students who stay for a full day, a one-hour supervised lunch/recess period is included. Students bring their own sack lunch.	

For locations and additional information: Visit <https://www.ctd.northwestern.edu/summer-programs>

Day Camp application: Visit <https://my.ctd.northwestern.edu/> to begin your application.

For more information, please visit the website or contact [CTD-admissions@northwestern.edu](mailto:CTD-admissions@northwestern.edu)

#### Admission Criteria, PreK – Grade 2

PreK – Grade 2 courses are open enrollment: There are no test scores or further documentation required for participation. PreK students must be age 4 by the start of class.

### Admission Criteria, Grades 3 - 6

Day Camp Course Subject-Area	90 <sup>th</sup> percentile or higher on a nationally normed grade-level assessment such as NWEA / MAP in:
Math	Math
English / Language Arts & Humanities	Verbal / Reading
Science / Technology / Engineering	Math OR Verbal / Reading

Portfolio applications are accepted for grades 3 – 6. A portfolio application requires a teacher recommendation and a recent grade report. For more detailed information regarding Admission Criteria, please visit the [CTD Eligibility Page](#).

## PreK - K / Half Day Courses, One Week

*Open Enrollment, must be four years old at the start of class.*

### Half-Day Morning and Afternoon Courses

A.M. 9 a.m. – 12 noon

P.M. 1 p.m. – 4 p.m.

#### Doctors and Dentists (PreK – K)

How do doctors and dentists help us stay healthy? In this introductory course, students learn about human biology through the lens of the health care profession. Discover scientific vocabulary and information about the body's systems as you engage in dramatic play and hands-on learning about biology fundamentals.

*SUBJECT AREA: Science*

#### Fast and Faster (PreK – K)

Do you have the need for speed? Engineers use physics and technology to design machines that go incredibly fast. Students explore the science behind what propels cars, planes and other machines to move at extraordinary speeds. Through collaborative project work, including building and other interactive activities, students learn basic physics principles around motion and velocity.

*SUBJECT AREA: Science*

#### Robot Navigation (PreK – K)

Using age-appropriate technology tools such as BeeBots or Primo Cubetto, learn how to tell robots where to go and what to do when they don't listen. This course combines a variety of navigational challenges including programming on a grid, synchronization of movements, avoiding obstacles, and predicting traffic patterns. Develop coding and spatial reasoning skills through dramatic play, construction, engineering, and storytelling.

*SUBJECT AREA: Technology & Engineering*

#### If I Ran the Zoo (PreK – K)

Students take on the roles of zookeepers and veterinarians to make important decisions about which animals to keep in their zoo and how to care for them. Young animal enthusiasts conduct research and design animal habitats, create signs and other zoo literature, and discuss ethical issues related to zoo life and endangered animals. Early literacy skills are developed through drawing, dictation, and emergent writing.

*SUBJECT AREA: English & Language Arts*

#### Magnets and Mirrors (PreK – K)

Magnets have the power to make objects move as if by magic. Mirrors can play tricks with how we view the world. In this interactive science class, students conduct experiments rooted in core concepts of physical science, such as magnetism, gravity, polarity, reflection, and magnification. Discover the science concepts behind the "magic!"

*SUBJECT AREA: Science*

### **Surprising Spills and Messes (PreK – K)**

Pour, stir, and spill! Students create their own crazy chemistry concoctions, observe the amazing (sometimes messy) results, and document their discoveries and conclusions. Aspiring scientists develop their reasoning skills through exploration of the properties of liquids, solids and gases, including differences in shape and boundaries.

*SUBJECT AREA: Science*

### **Math for Sports (PreK – K)**

What's the score? How far is the goal? Why are there trapezoids in hockey? Circles and rectangles in basketball? Math can tell us about scores and so much more about athletic performance. Students run, kick, shoot, and score, then measure calculate, analyze, and estimate to demonstrate how math and sports are on the same team.

*SUBJECT AREA: Math*

### **Puzzle Party (PreK – K)**

Patterns and problem-solving are integral to party planning! In this class, students engage in hands-on problem-solving and play out imaginative narratives with a party theme. They imagine and engage with the problems that are a part of planning a party. For example, what is the ratio of cupcakes to party guests? Can you figure out how many people can sit at one table, and then use patterns to calculate how many tables are needed in total for the festivities? Students apply visual-spatial reasoning skills as they design the party space. They take on challenges to expand logic skills, pattern recognition and spatial reasoning.

*SUBJECT AREA: Math*

### **Math in the Animal World (PreK – K)**

Would a sprinting cheetah beat a speeding porpoise in a race? How far do geese migrate each year? Young mathematicians use numbers to tackle story problems, carry out simple data experiments and describe behavior in the fascinating world of animals. Compare differences among animal species and the things our favorite animals can do as you build analytical and computational skills through data comparisons, single-digit multiplication and algebraic equations.

*SUBJECT AREA: Math*

### **Pirates and Treasures (PreK – K)**

By reading and listening to fiction and nonfiction picture books, students discover both facts and tales of pirates and treasures. Study the historical forces that surrounded pirating in different parts of the world during different time periods and engage in role-play as pirates sailing using handmade tools like a compass or telescope. Develop writing skills and organize ideas through creative storytelling of pirate adventures.

*SUBJECT AREA: English & Language Arts*

### **Puppet Productions (PreK – K)**

Puppets help us become better storytellers. Young storytellers learn about character, story sequence, and the structure of puppet plays. Through storytelling, role-playing, and other interactive activities, students extend their organizational and language skills. In collaboration with their classmates, students create, share and perform original stories.

*SUBJECT AREA: English & Language Arts*

### **Mouse House: Tiny Habitats in Stories and Nature (PreK – K)**

Storybook mice, such as Stuart Little, fascinate readers with their tiny furniture and cozy little living spaces. Students explore how the homes of fictional characters compare to the habitats of real mice and other small animals. Read-alouds and storytelling combine with an introduction to research skills, critical thinking, and creative writing.

*SUBJECT AREA: English & Language Arts*

## Grades 1 - 2 / All-Day Courses, One Week

*Open Enrollment*

**All-Day Courses:** 9 a.m. – 4 p.m.

### **Engineering Simple Machines (Gr. 1-2)**

Young engineers develop an understanding of simple machines, exploring terms like work, energy, force, and effort through hands-on experiments. Students gain experience with foundational physics concepts with wheels and axles, wedges, pulleys, screws, inclined planes, and levers. Discover where these machines are used in everyday life, and then apply this knowledge to create original multi-step machines that perform simple tasks.

*SUBJECT AREA: Technology & Engineering*

### **Storytelling with Scratch (Gr. 1-2)**

How can we tell a digital story? Create original storylines and narratives across genres and animate them in Scratch, a block-based programming language for kids. Design code, sketch animations and backgrounds, and develop characters that tell your story in a digital format. Explore how technology can enrich our storytelling experience and abilities. This interdisciplinary course blends advanced creative writing strategies with computational concepts and integrative problem-solving skills.

*SUBJECT AREA: Technology & Engineering*

### **Grossology (Gr. 1-2)**

The human body conducts fascinating and sometimes repulsive bodily functions, but all serve a valuable purpose. From spit and vomit to sweat and snot, curious students expand their critical thinking skills as they engage in experiments and activities to learn about systems of the human body and their role in indicating illness and maintaining health. This course builds fundamental biology skills for future study.

*SUBJECT AREA: Science*

### **Kitchen Chemistry (Gr. 1-2)**

Did you know your kitchen is really a chemistry lab? In this course, epicurean explorers unravel mysteries of food preparation through chemistry and human biology. Students employ hypothesis testing, create and record chemical reactions and observe how many of the foods we love are the result of scientific processes at work. **NOTE FOR THOSE WITH FOOD ALLERGIES:** Students will be viewing demonstrations and engaging directly with food products in this course (not including peanuts or tree nuts). CTD cannot guarantee any allergy-free environment in this course. Please contact the Summer Program staff with any questions or concerns before registering.

*SUBJECT AREA: Science*

### **Awesome Explosions and Collisions (Gr. 1-2)**

What can be learned from investigating collisions and explosions? Hands-on science experiments allow students to bump, crash and jolt a wide variety of materials. Students develop critical thinking skills as they explore how explosive phenomena such as impact craters, the Big Bang, and plate tectonics reveal a wealth of scientific knowledge about our world.

*SUBJECT AREA: Science*

### **Rocket Science: Blast Off with Newton (Gr. 1-2)**

How do rockets blast off? Why do balloons fly in circles if you let the air out? Junior rocket scientists investigate Newton's laws of motion through demonstrations, online simulations and by conducting experiments. Students will apply what they learn by building and launching their own simple rockets.

*SUBJECT AREA: Science*

### **Animal Adaptations: Zoology (Gr. 1-2)**

In this course, young zoologists investigate amazing animals from around the world, each with astounding physical traits and behaviors that help them survive in their environments. Through research and hands-on activities, students learn

about animal classification, a variety of habitats, and the survival methods of animals that live in them. Students are challenged to advance their critical thinking skills as they consider the implications of environmental changes for future generations of species.

**SUBJECT AREA:** *Science*

### **Fibonacci and Friends (Gr 1-2)**

Fibonacci found mathematical patterns in the flora and fauna. Pascal saw the magic of numbers in a triangle. Alan Turing and Katherine Johnson deciphered codes that changed history. Through the study of these famous individuals, and their own investigations, students break codes and analyze complex patterns. Solve problems and build algorithmic thinking skills while testing out encryption and decryption methods along with other math puzzles.

**SUBJECT AREA:** *Math*

### **Are You My Perfect Pet: Mathematical Decisions Making (Gr. 1-2)**

Zeus the Great Dane is a dog who stands over seven feet tall, weighs about 200 pounds and holds the title of world's tallest dog according to Guinness World Records. His owner must love him very much. How much? We may not be able to find the answer to that question, but we can find out a lot about our pets and other animals by asking, "How much?" Students calculate and compare, building computation and data skills as they find the solutions to the mathematical problems of pet ownership.

**SUBJECT AREA:** *Math*

### **Treasure Hunt: Math and Maps (Gr. 1-2)**

Making maps, or cartography, involves many different geometry skills. Adding the mystery of buried treasure makes the process even more fun! Students apply principles of geometry and concepts of cartography to create their own treasure maps and use classmates' maps to locate their treasure.

**SUBJECT AREA:** *Math*

### **Heroes and Villains (Gr. 1-2)**

Is the giant at the top of the beanstalk really a villain? What traits make one character a hero and another a villain? From the perspective of new and familiar heroes and villains, students analyze the elements of storytelling. As they read a variety of stories, students analyze the power of plot, explore the ways heroes and villains can interact in a story, and develop their own original archetype story. Students develop creative writing skills through role-play, writing, illustrations, and dictation, and create stories about their own hero or villain.

**SUBJECT AREA:** *English & Language Arts*

### **Fantastical Creatures in Fact and Fiction (Gr. 1-2)**

Students expand their reading, analysis and listening skills through the exploration of fantastic tales about mysterious creatures, such as the Loch Ness monster and dragons. Use a variety of sources to craft original written accounts of these eye-popping creatures in unique formats such as news reports and short stories. Students collaborate to strengthen their fiction and nonfiction writing skills.

**SUBJECT AREA:** *English & Language Arts*

## **Grades 3 - 5 / All-Day Courses, One Week**

*Emerald Tier Enrollment: visit the [CTD Eligibility Page](#) for details.*

**All-Day Courses:** 9 a.m. – 4 p.m.

### **GRADES 3-4**

#### **Geometry Unfolded: Spatial Reasoning in 2D & 3D (Gr. 3-4)**

From origami to computer modeling, visualizing 2D geometric problems in 3D allows scientists and engineers to design solutions to complex challenges from space telescopes to curbing the spread of disease. Explore and investigate geometric and spatial concepts in a fun, engaging way by illustrating original 3D images, creating and solving puzzles, learning the art and math of origami, manipulating 3D shape nets and building 3D designs.

*SUBJECT AREA: Math*

*QUALIFYING AREA: Math*

### **Brain Games: Math Logic (Gr. 3-4)**

Explore and build a variety of mathematical, deductive reasoning and logic puzzles to build problem solving strategies and stretch your "math mind!" Through independent and collaborative efforts, students strategize solutions and grapple with games as they learn about the similarities between how humans solve problems and how we program computers to solve problems. Develop foundational computational thinking skills for future programming and advanced mathematics courses.

*SUBJECT AREA: Math*

*QUALIFYING AREA: Math*

### **Comic Book Characters (Gr. 3-4)**

Graphic novels and comic books cover topics from superheroes to historical events, capturing complex ideas through a unique combination of text and illustrations. As students learn the elements of graphic novels and comics, they focus on applying these elements to build strong characters and plot lines in their own stories. Students build their skills as a writer to organize and express their own ideas with words and images.

*SUBJECT AREA: English & Language Arts*

*QUALIFYING AREA: Reading*

### **Journalism 101 (Gr. 3-4)**

Aspiring journalists conduct research, think critically about reliable sources, and separate fact from opinion in this introductory course. Develop techniques for conducting interviews and asking good questions about a topic. Students incorporate key nonfiction writing skills to brainstorm and write articles about topics of interest, and collaborate with peers to develop their own classroom publication.

*SUBJECT AREA: English & Language Arts*

*QUALIFYING AREA: Reading*

### **Brain Surgery (Gr. 3-4)**

Young neurologists go inside the brain to analyze its systems and understand its connection to the rest of the body. Among other activities, students map the brain, experiment with senses and the brain, and use interactive web tools to investigate this amazing and complex organ. This course 'stretches' students' brains as they advance their systems thinking skills to understand the nervous system as a whole.

*SUBJECT AREA: Science*

*QUALIFYING AREA: Reading OR Math*

### **Physics: Force and Motion (Gr. 3-4)**

In this fast-paced course, students investigate and apply physics principles by designing and building objects and vehicles that move and crash. What begins as a question of speed becomes a fun ride on the road of creative reinvention, where design-engineering skills get better with every test drive. Discuss physics examples from human history and the animal world. Skills in computational thinking, observation, and data collection are critical for the ongoing study of engineering, physics, and other lab sciences.

*SUBJECT AREA: Science*

*QUALIFYING AREA: Reading OR Math*

### **How Things Work: Electronics, Sensors, and Circuits (Gr. 3-4)**

Electricity is all around us. We use it to play, but we are warned not to play with it. In this course students investigate simple circuits and sensors by safely making and breaking them. Using a range of everyday materials and their



imaginations, students will learn the fundamentals of electricity and robotics, and how to think like electrical engineers, as they participate in design challenges.

*SUBJECT AREA: Technology & Engineering*

*QUALIFYING AREA: Reading OR Math*

### **LEGO® Architecture: Landmark Designs (Gr. 3-4)**

What makes a structure a landmark rather than just a building? Does it involve its distinctive features, or its function or location? Or does it have to do with its meaning to those who use and see it? An architect's design considers all of these factors. Using LEGO® bricks and household materials, student designers solve building challenges as they learn about architectural elements and engage in the design process. Apply concepts of engineering, art and urban planning to create original landmark designs.

*SUBJECT AREA: Technology & Engineering*

*QUALIFYING AREA: Reading OR Math*

### **Coding: Break It, Build It (Gr. 3-4)**

Computational thinking requires decomposition, the ability to take an idea and break it down into smaller parts for deeper understanding and analysis. In this course, students create coding projects using a variety of digital tools and collaborate with other programmers. Tangible materials like logic games and 3D puzzles challenge students to demonstrate their thinking using new tools. As students take what they learned through hands-on activities and represent those concepts in code, their understanding deepens and computational thinking skills are strengthened.

*SUBJECT AREA: Technology & Engineering*

*QUALIFYING AREA: Reading OR Math*

## **GRADES 4-5**

### **Robotics with Microcontrollers (Gr. 4-5)**

A working robot is the result of both programming expertise and an effective design engineering process. Through their input/output ports, microcontrollers actuate motors, lights, sensors and sounds. Students gain hands-on experience designing, building and programming responsive, kinetic structures and/or robots using visual programming languages and microcontrollers. Through exploration and collaboration, sharpen the design and computational thinking skills needed to build the next great robot.

*SUBJECT AREA: Technology & Engineering*

*QUALIFYING AREA: Reading OR Math*

### **Civil Engineering with LEGO® (Gr. 4-5)**

In this course, collaborate to plan and create buildings, roads, and city infrastructures using building materials including LEGO® architecture bricks. Challenge and strengthen critical and design thinking skills as you consider how to meet a community's needs based on principles of urban planning and design engineering. The design and problem-solving approaches used in this course are important for the ongoing study of engineering and architecture.

*SUBJECT AREA: Technology & Engineering*

*QUALIFYING AREA: Reading OR Math*

### **Stop-Motion Storytelling (Gr. 4-5)**

Tell your story, one frame at a time! This class reinforces the essentials of storytelling – plot, theme, character and setting – and applies them to the creation of original, stop-motion short films using advanced software and technology. Learn how to take, edit and create individual photos that add up to a moving story!

*SUBJECT AREA: Technology & Engineering*

*QUALIFYING AREA: Reading OR Math*

### **Architecture: Proportion, Physics, and Problem-Solving (Gr. 4-5)**

While the façade and structure of buildings change, some parts of architecture and design remain timeless. Explore the architectural design process using math, physics and visual-spatial reasoning skills. Through hands-on building projects,

blueprint sketching and analysis of historic architects and their designs, students investigate the depth and breadth of the field of architecture. Evaluate the value of the Golden Ratio and apply problem-solving skills to build original designs and models.

*SUBJECT AREA: Technology & Engineering*

*QUALIFYING AREA: Reading OR Math*

### **Introduction to Genetics (Gr. 4-5)**

What does it mean to say, “it’s in the genes?” Genes are the “blueprints” for color of our eyes and hair, our height, and our predisposition to certain illnesses. Learn how genes and DNA determine individual traits, discuss advances in the field such as the Human Genome Project. Students will consider structure of DNA, mutability of genes, regulation of gene networks and genetic engineering as they participate in simulations and other hands-on activities.

*SUBJECT AREA: Science*

*QUALIFYING AREA: Reading OR Math*

### **Survivor Math (Gr. 4-5)**

Students imagine themselves in a variety of situations and play out scenarios that require problem solving skills to survive. Measuring, building, mapping and calculating ensure survival while they push students’ spatial reasoning, algebraic thinking and computational skills in order to make it out alive. The application of math concepts in novel and intriguing contexts encourages creative mathematical thinking in any setting, which is foundational for future study in other disciplines such as physics, engineering and operations research.

*SUBJECT AREA: Math*

*QUALIFYING AREA: Math*

### **Personal Narrative: Multimedia Storytelling (Gr. 4-5)**

Podcasts, films and social media threads: There are so many ways to tell a story in our modern world. How do we choose the best format to share personal narratives? How do you ensure your voice is heard? Students explore how to highlight the most important parts of a personal narrative in diverse media formats. In this writer’s workshop-style course, discover new ways to tell stories, using various types of media.

*SUBJECT AREA: English & Language Arts*

*QUALIFYING AREA: Reading*

### **Novel Engineering (Gr. 4-5)**

How do we visualize what we read in literature? Could you draw a Quidditch field? Or design the central intelligence building on the dark planet of Camazotz? In this arts-integrated course, read and analyze excerpts from a variety of novels and then design an environment not yet visualized from those stories. Projects involve creative writing, drawing and constructing three-dimensional structures.

*SUBJECT AREA: English & Language Arts*

*QUALIFYING AREA: Reading*

## **Grades 5-6 / All-Day Courses, Two Weeks**

*Emerald Tier Enrollment: visit the [CTD Eligibility Page](#) for details.*

**All-Day Courses:** 9 a.m. – 4 p.m.

### **Detective Science (Gr. 5-6)**

“It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.” Apply this guiding philosophy of Sherlock Holmes to the forensic science involved in solving crimes, including learning how to collect fingerprints, crack secret codes and examine evidence. Topics and activities range from life science, psychology and physical science are combined to solve complex mysteries.

*SUBJECT AREA: Science*

*QUALIFYING AREA: Reading OR Math*



### **Brain Science (Gr. 5-6)**

Discover the secrets of “the most complex thing in the universe” - your own brain! The brain is a three-pound mass of miles of nerve fibers that controls everything you do and how you react to the world. Through research and hands-on activities, investigate how the brain impacts your decisions, controls your memory, influences your mood and more!

*SUBJECT AREA: Science*

*QUALIFYING AREA: Reading OR Math*

### **The Wars Within: Allergies, Diseases, and Our Immune System (Gr. 5-6)**

Explore how our bodies respond to allergens, disease causing pathogens and everyday microorganisms by exploring different types of microscopic invaders. Investigate how each person's immune system keeps them healthy, as well as the mechanisms that allow infectious diseases to spread between people locally and globally. This interdisciplinary course connects science, history and current events and will include hands-on activities and labs.

*SUBJECT AREA: Science*

*QUALIFYING AREA: Reading OR Math*

### **Machine Physics (Gr. 5-6)**

How would you create a simple machine to test your physics ideas? Put your ideas to the test in this hands-on introduction to physics and engineering! Explore physics concepts such as force, acceleration, potential and kinetic energy and torque as you apply them to the creation of ramps, levers and other simple machines. This class is a great preparatory experience for students interested in Science Olympiad events.

*SUBJECT AREA: Science*

*QUALIFYING AREA: Reading OR Math*

### **Green Design: Engineering Solutions for a Changing Planet (Gr. 5-6)**

As Earth's climate changes, how will we live differently? Students will consider the nuances of the predicted global effects of climate change and use creative thinking and engineering skills to innovate solutions for individuals, communities and nations. Students experience a broad range of science and engineering fields, such as architecture, industrial design, civil engineering, ecology, structural and materials engineering, and prepare for future study and careers in science, engineering and architecture.

*SUBJECT AREA: Technology & Engineering*

*QUALIFYING AREA: Reading OR Math*

### **Debate and Discourse: Current Events (Gr. 5-6)**

Learn the art of public speaking and debate as you sharpen your presentation skills, refine your arguments and broaden your thinking. Research positions on current issues and learn to present your ideas effectively by exploring different debate styles and analyzing professional debates.

*SUBJECT AREA: English & Language Arts*

*QUALIFYING AREA: Reading*

### **Creative Writing: Fan Fiction Workshop (Gr. 5-6)**

How many stories can come from one? What if Katniss had chosen Gale instead? What if Sam had abandoned Frodo? If you've ever wondered, you're not alone. Fan fiction is a term for stories written by anyone that take place in, or use characters from, a popular work. There are millions of fan fiction stories online from all over the world. While examining why some fan fiction stories “work” while others do not, participants will tap into their love of a world or character to develop their own creativity and fan fiction story.

*SUBJECT AREA: English & Language Art*

*QUALIFYING AREA: Reading*

### **The Math of Games (Gr. 5-6)**

Students examine critical math topics through the lens of puzzles and games including chess, modern strategy, and games of chance. Explore concepts from algebra and geometry, as well as probability and statistics. Apply the concepts of risk analysis, expected value and outcomes to create your own game and predict the success of the players! The course culminates with a carnival of student-created games.

*SUBJECT AREA: Math*

*QUALIFYING AREA: Math*