

# Spring 2023 Weekend Programs Course Catalog

## PreK - Grade 8

Northwestern University's Center for Talent Development (CTD) has an array of high-quality, captivating online and in-person enrichment courses available for students on Saturdays. Our courses focus on high-interest topics, include both collaborative group work and individual hands-on projects, and are led by expert instructors who demonstrate the joy in learning. Courses in mathematics, science, design & engineering, and computer science & technology engage students during six Saturdays. Students with demonstrated strengths in verbal/reading and/or math, depending on course, may apply. See <https://www.ctd.northwestern.edu/eligibility> for eligibility details. Visit our [application page](#) to begin your application. NOTE: The spring weekend program application will open in late January, 2023.

Weekend Enrichment Program Details
<b>Dates:</b> Saturdays, April 15, 22, 29, May 6, 13, and 20, 2023
<b>Times:</b> 9:00 a.m. - 11:30 a.m.; select afternoon courses also in Evanston (12:00 p.m. - 2:30 p.m.)
<b>Locations:</b> Evanston and Chicago - view the <a href="#">Weekend Enrichment Program web page</a> for details.
<b>Tuition:</b> \$365

## PreK - Kindergarten

### Geometry Jumpstart

*Offered: Evanston (AM and PM) and Chicago*

Where do we see shapes in buildings and the objects we use? Through hands-on building, stories, movement and song, young mathematicians discover geometric concepts found in nature and our everyday environment. Investigate the shapes, properties and language of geometry, and identify symmetries and patterns in two and three dimensions. Apply math knowledge to create shapes, patterns and structures using a variety of materials.

*Open Enrollment: no eligibility requirements*

*SUBJECT: Math*

## Kindergarten - Grade 1

### Exploring Multiplication

*Offered: Evanston (AM and PM) and Chicago*

How can we use mathematical patterns to count? Boots, mittens, eyebrows, chopsticks, place settings—in math, a set is a collection of things that share a common element. By exploring items that come in pairs and groups, young mathematicians venture into multiplication while building upon their knowledge of addition. Using hundreds charts, arrays, skip counting and stories, learn to identify patterns and to create simple equations.

*Open Enrollment: no eligibility requirements*

*SUBJECT: Math*

## Grades 1 – 2

### Biorobotics & Coding

*Offered: Evanston (AM and PM) and Chicago*

Engineers in the field of robotics are inspired by nature every day, designing robots that can slither, crawl, jump, swim and fly. In this course, aspiring roboticists study the unique ways animals move and use their bodies to do amazing things in their environment and consider animal-inspired robots that have already been built by engineers. Discover how robots use sensors to respond to stimuli and apply the engineering design process to develop your own ideas influenced by animals near and far.

*Open Enrollment: no eligibility requirements*

*SUBJECT: Technology and Engineering*

### Neuroscience in Action: The Brain and Our Senses in Action

*Offered: Evanston (AM, only) and Chicago*

How do we hear? Why do certain smells make us hungry, while others make us nauseous? Young neuroscientists explore the brain and how its systems work. Compare and contrast the anatomy of the human brain with animal and robotic brains to understand what

makes us unique. Through hands-on explorations and experiments, observe how our brain receives sensory information from our body and how it makes sense of that information.

*Open Enrollment: no eligibility requirements*

*SUBJECT: Science*

## Grades 3 – 4

### **Marine Biology**

*Offered: Evanston (AM, only) and Chicago*

The ocean supports a great diversity of life and ecosystems, known and unfamiliar. In this course, discover how biology, physics and related areas of science are interconnected as you explore oceanic zones, habitats and the life forms found within them. Learn about marine life cycles and food chains, the interdependence and survival of ocean creatures and plants, and more. Consider how human behavior impacts the ocean and investigate cutting-edge environmental engineering efforts to protect marine habitats.

*Qualifying Area: Reading OR Math*

*SUBJECT: Science*

### **Game Design and Construction**

*Offered: Evanston (AM and PM) and Chicago*

Designing a great game requires creativity as well as logic, analysis and innovation. Designers must think about what makes a game appealing and what keeps it engaging. Students apply principles of design, such as prototyping, testing and gathering feedback. While utilizing the iterative process, they choose and refine their own game themes and mechanics to maximize the fun. Young designers will create a variety of games, such as board games, card games and/or digital games.

*Qualifying Area: Reading OR Math*

*SUBJECT: Technology and Engineering*

## Grades 5 – 6

### **Math Behind Predicting Olympic Winners**

*Offered: Evanston (AM, only) and Chicago*

Building a world-class Olympic team involves not only serious training, but serious math too. How do coaches decide which players to start each game, or which athletes to enter into specific events? How do professional athletes use data to size up their competitors and prepare for matches? In this data analytics class, students learn how to use statistics to measure an athlete's performance over time and debate the merits of "scouts vs. stats" as they create their own dream Olympic team.

*Qualifying Area: Math*

*SUBJECT: Math*

### **Forensic Science**

*Offered: Evanston (AM and PM) and Chicago*

A half-eaten tuna sandwich, a blood spot and lipstick on a glass: these might seem like completely unrelated elements at a crime scene, but for forensic scientists these could be clues to solve crimes. Explore the procedures utilized in crime scene investigation and forensic science and apply the scientific method to identify whodunit. Through hands-on labs and activities, students roleplay a forensics team investigating an active crime scene and learn the science behind forensic tests. Topics from physics, chemistry and biology are covered as students delve into the world of the crime lab.

*Qualifying Area: Reading OR Math*

*SUBJECT: Science*

## Grades 7 – 8

### **Computational Modeling: Programming with NetLogo**

*Offered: Evanston, only (AM, only)*

Are there ways to increase people's involvement in democratic processes? What are the challenges of integrating autonomous cars into the traffic of large cities? How can transportation authorities help contain the spread of diseases? Computer-based modeling helps scientists, economists, health care professionals and others deeply understand such complex questions and offer potential solutions. Using the NetLogo agent-based modeling environment, students create their own computer-based models in order to propose solutions to important contemporary challenges of society and our planet.

*Qualifying Area: Reading OR Math*

*SUBJECT: Technology and Engineering*

### **Materials Science and Engineering: Sustainable Technology**

*Offered: Evanston (AM and PM) and Chicago*

Students immerse themselves in the engineering method as applied to the world of materials science. Define real-world problems, research and brainstorm solutions, prototype and test designs, and practice communicating scientific information using the lens of an engineer who wants to maximize the effectiveness of a design based on the materials used to develop it. Example projects may include

cleaning up an oil spill, testing landfill designs, creating a recycled fabric to limit fast fashion waste, building and testing solar cells, or developing an efficient reusable battery.

*Qualifying Area: Reading OR Math*

*SUBJECT: Technology and Engineering*