Spring 2020 Advanced Enrichment Programs

Age 4 - Grade 8

Saturday and Sunday courses at Center for Talent Development (CTD) are challenging and enriching opportunities for academically talented students. Our courses in English & Language arts, mathematics, science, design & engineering, and computer science & technology engage students during six consecutive Saturdays (all sites) OR six consecutive Sundays (Evanston only) in the spring. Students with demonstrated strengths in verbal/reading and/or math, depending on course, may apply. See www.ctd.northwestern.edu/weekend for eligibility details.

Dates: Saturdays: April 11 – May 16; Sundays: April 12 – May 17
Locations: Please view the spring course chart to see what courses are offered near you. We offer courses in Chicago, Evanston, Naperville, Northbrook, and Palatine.
Times: Morning courses (9 a.m. - 11:30 a.m.); Saturday afternoon courses (noon - 2:30 p.m.);
Tuition: $340
Application: visit my.ctd.northwestern.edu to begin your application

Age 4

No test scores are required for Age 4 classes.

Rainforest Expedition (Age 4)

Why are rainforests called the "jewels of the Earth?"
Did you know that about half of the world's species of plants and animals are found in the rainforest? Dive into the rainforest - from the floor up through the canopy - and examine the diversity of life in this vast ecosystem. The rainforest comes alive as students learn about a wide variety of animals and plants that call rainforests their home, including iguanas, monkeys, water lilies, orchids, harpy eagles, sloths and more! Through hands-on activities, dramatic play, and literature students explore the similarities, differences and connections between their everyday environment and the lush rainforest environment as they investigate what grows and lives on each level.
SUBJECT AREA: Science

PreK - Kindergarten

Purposeful Probability: The Likely & the Impossible (Pre-K)

How can we use math to say whether we expect something to happen or not?
Through fun, hands-on games and experiments, students make connections between math and real life to develop a basic understanding of chance and likelihood, learning mathematical terms along the way. Together, students collect, organize and analyze data, building crucial skills in systematic thinking and logic and exploring the idea that certain results are mathematically more likely to occur.
SUBJECT AREA: Math

Astronomical Adventures (PreK-K)

How can learning about our solar system teach us about our own planet, Earth?
Young astronomers learn about the objects in our solar system and how they impact each other. Discover how the Earth’s orbit gives us day and night and our seasons, how the moon appears to us on the planet’s surface.

Kindergarten - Grade 1

Time Travelers (K-1)

How does an event in the past influence the future?
What was it like to travel the Oregon Trail? Have you ever wondered what it would have been like if humans lived alongside dinosaurs? Travel back in time to interesting pivotal moments in Earth's history to uncover what life was like in the past and explore the impact that living things have had on the Earth. Imagine and compose narratives from the point of view of both humans and creatures throughout history, using role-play, visualization and creative writing.
SUBJECT AREAS: English & Language Arts, Humanities

Making Sets (K-1)

How can we use mathematical patterns to count?
Boots, mittens, twins, eyebrows, chopsticks—in math, a set is a collection of things that share a common element. By brainstorming items that come in groups, young mathematicians start their venture into multiplication while building upon their knowledge of addition. Using traditional tools (hundreds charts, arrays, skip counting) as well as games, activities and stories, students learn to identify patterns and create simple equations.
SUBJECT AREA: Math

Involving Dissolving (K-1)

How do physical changes occur?
Are “melting” and “dissolving” the same thing? Dissolve, crystallize, and evaporate solutions in this introduction to the world of chemistry. Develop a foundation in physical properties in a safe and engaging environment. Cool projects include turning common chemical substances into intricate crystals.
SUBJECT AREA: Science
Grades 1 – 2

Our Solar System & the Universe (Gr. 1-2)
How has the universe changed over time?
Take a journey through space and time in this exciting course that explores the formation of the sun, planets, stars, and universe. Through activities, research, and experiments, young astronomers learn about the objects in our solar system, comets, asteroids, space travel, black holes, and theories about how the universe began and how big it really is. Future scientists expand their understanding of the components of the universe.
SUBJECT AREA: Science

Biorobotics: Technology Inspired by Animals (Gr. 1-2)
How does a robotic sensor work? What purposes does it serve?
How does the movement of an octopus tentacle differ from the movement of the human arm, and how might that movement be useful on a robot? Engineers in the field of robotics get inspired by nature every day, and there are now 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 learn about the animal-inspired robots that have already been built by engineers. Discover how robots use sensors to communicate information and apply the engineering design process to develop your own ideas influenced by animals near and far.
SUBJECT AREAS: Computer Science & Technology, Design & Engineering

Grades 2 – 3

From the Newsroom: Science Reporters (Gr. 2-3)
How can scientific information be most accurately portrayed to an audience?
How can you explain the complicated process of metamorphoses in basic terminology? Research scientific breakthroughs, paraphrase your findings, and act as a science correspondent for a national news broadcast. Gain experience using various media (such as video, audio, or written text) to report your stories. Engaging activities will focus on scientific nonfiction reading and writing, analysis, and presentation skills, in addition to strategies that illuminate biases and accuracy in reporting.
SUBJECT AREAS: English & Language Arts, Humanities, Science

Math for Explorers: Geometry, Maps & Coordinates (Gr. 2-3)
How do we use geometry to navigate the world?
Explorers and treasure hunters wanted! World travelers-in-the-making use geometry and calculations to navigate the globe. Students examine how shape and space influence mapmaking and experiment with compasses and scales to create their own maps. Explore fictional destinations and develop original treasure maps while building math and spatial thinking skills.
SUBJECT AREA: Math

Aircraft Engineering (Gr. 2-3)
What major engineering and design principles make flight possible?
From hot air balloons to space launching systems, how do we create structures that are light, durable, and safe? This course introduces aerospace engineering concepts as students investigate tools, terminology, and design principles of flying machines. Design, build, test, and analyze results in hands-on physics and engineering experiments related to airplanes and spacecrafts. Explore how engineering influences the development of new materials and designs for flight.
SUBJECT AREAS: Science, Design & Engineering

Advanced Scratch: Leveling Up Your Games & Animations (Gr.2-3)
How can we write Scratch programs that are complicated enough to challenge the user?
Students with previous Scratch experience apply their prior knowledge to create complex digital stories and sophisticated games and animations while developing new proficiencies in the process. Explore how math connects to coding. Workshop your ideas with other accomplished Scratch programmers to take your skills to the next level. Understand the similarities between Scratch and common text-based programming languages such as Python. Previous experience with Scratch required.
SUBJECT AREA: Computer Science & Technology

Grades 3 – 4

Puzzle Masters: Math & Computational Thinking (Gr. 3-4)
How do computers and mathematicians use step-by-step processes to solve large problems?
Explore important math concepts like algorithms, conditions, probability, and symbols through puzzles, games, patterns, and stories. Solve a variety of mathematical, logical, verbal, and visual-spatial puzzles and problems. Investigate the concepts behind how computers encode and sort information, solve problems, display images and encrypt data. Use your math mind to think like a computer and become a master of puzzles, brainteasers, and creative problem solving!
SUBJECT AREA: Math

Intro to Python (Gr. 3-4)
How can we design Python code that is easy to read and write?
Python is a powerful, flexible, yet simple object-oriented programming language with applications across fields from gaming to Google. In a collaborative, workshop setting, develop essential text-based coding skills. Projects may include making original music, developing original images and patterns, and creating simple computer games.
Note: This course is intended for students who've completed prior programming courses with CTD.
SUBJECT AREA: Computer Science & Technology
Digital Architects (Gr. 3-4)

How do architects use math, physics and art to design buildings?

Explore the architectural design process using math, physics, and visual-spatial reasoning skills. Through hands-on building projects, blueprint sketching, and digital modeling software such as SketchUp-Make® 3D, novice architects investigate how buildings come to be and how people interact with the built environment. Students experience how math and art come together as they design and create their own model buildings.

SUBJECT AREAS: Computer Science & Technology, Design & Engineering

Grades 4 - 5

Graphic Novels: Splashes, Spreads & Speech Balloons (Gr. 4-5)

How do art and words work together in comics?

Explore action, emotion and humor through the development of your own comic book creation. Engage in the creative process to hone skills in drawing, storytelling, drafting and page design, while also examining notable graphic novels of the past and present. Workshop your ideas with fellow storytellers and comic book fans to develop believable characters, unique worlds, and engaging plots. This course concludes with the class’s very own “Comic Con!”.

SUBJECT AREAS: English & Language Arts, Humanities

Pre-Algebra: Data, Statistics & Probability (Gr. 4-5)

What skills or tools are needed to effectively compute with numbers?

Linked to the Common Core State Standards, this pre-algebra series incorporates three courses offered sequentially in the fall, winter, and spring. Students may participate in any or all of these courses beginning in any session. Through exploration, practice and application, students develop skills to deepen their understanding of mathematical ideas and apply them to real world settings.

SUBJECT AREA: Math

Introduction to Java Programming (Gr. 4-5)

What is the value of a common coding language?

Learn about the Java programming language and object orientation through the use of Greenfoot, a complete, interactive Java-based development environment. As you build your own games, explore basic programming concepts and learn to write in real code. Enhance your games with images and sounds.

SUBJECT AREA: Computer Science & Technology

Forensic Science (Gr. 4-5)

How do forensic investigations rely on physics, chemistry and biology to solve crimes?

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 role play 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.

Note: Additional $10 materials fee required.

SUBJECT AREA: Science

Grades 5 - 7

The Math Behind Data Science (Gr. 5-7)

How can we represent probability in different ways, and how does this help us make sense of big data?

Back in 2013 the New York Times indicated, “Data Science is a hot new field that promises to revolutionize industries from business to government, health care to academia.” Six years later, the demand for data scientists continues to grow - businesses, non-profit organizations, government agencies, and other analytical fields are dependent upon data science to effectively use and present information, as well as to best meet the needs of their clients. But what is math’s role in data science, and how can understanding some key math concepts help us navigate big data? Exploring concepts such as theoretical and experimental probability, probability models, and expected value, students apply a problem-based learning approach, using data to solve extended application scenarios.

SUBJECT AREA: Math

Sustainability & Environmental Engineering (Gr. 5-7)

How can science and engineering be used to solve society’s challenges?

Students immerse themselves in the engineering method as they define real-world problems, research and brainstorm solutions, prototype and test design solutions, and practice communicating scientific information. Apply real-world research and scientific inquiry to gain the skills necessary to be successful in advanced high school science courses. Example projects may include cleaning up an oil spill, testing landfill designs, building and testing solar cells, or developing an efficient reusable battery.

Note: Additional $15 materials fee required.

SUBJECT AREAS: Science, Design & Engineering

Beyond the Block: Programming with Python (Gr. 5-7)

How do you build your own unique games using simple code?

Python is a powerful, flexible, object-oriented programming language used for different real-world purposes in a variety of fields. Apply previously-learned core programming concepts as you further explore and develop tools and skills necessary to develop more complex programs. In a pair programming environment, collaborate with peers to workshop your creations. Build original games, animations, and more while learning about syntax, strings, conditionals and functions with this robust text-based language.

Note: This course is intended for students who have completed prior programming courses. Eligibility must be confirmed before enrolling.

SUBJECT AREA: Computer Science and Technology
Grades 6 - 8

Mock Trial (Gr.6-8)
What skills are necessary to be successful in resolving a dispute in a court of law?
May the record reflect that this course will explore key roles and responsibilities associated with the United States court system. Through hands-on simulation of a court setting gain awareness of the importance of processes and procedures in a court of law. Engage in interactive experiences designed to resolve disputes and to define and measure the level of justice in court decisions. SUBJECT AREAS: English & Language Arts, Humanities

Biotechnology: The Helpful & the Controversial (Gr. 6-8)
What are some ways that advances in biotechnology could affect society for the better? For the worse?
Genetic engineering, transgenic organisms, cloning, stem cell research and DNA fingerprinting - biotechnology is changing the world as we know it. Through labs, activities, debate, and discussions, students examine the relationships among these topics, as well as their economic, social and medical impacts, and learn how this field is helping improve everyday life. SUBJECT AREA: Science