Winter 2019 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 eight consecutive Saturdays (all sites) OR eight consecutive Sundays (Evanston only) in the winter. 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: January 19 - March 9; Sundays: January 20 - March 10
Locations: Please view the winter course chart to see what courses are offered near you. We offer courses in Chicago, Evanston, Naperville, and Palatine.
Times: morning courses (9 a.m. - 11:30 a.m.); afternoon courses (noon - 2:30 p.m.)
Tuition: $430
Application: visit my.ctd.northwestern.edu to begin your application

Age 4
No test scores are required for Age 4 classes.

Science Spies: Snooping for Answers (Age 4)
What is a scientist? How does pretending help us understand the job of a scientist? In this course, students put on their lab coats and explore like scientists. Young scientists use observation skills, play, and their curiosity to learn about the physical and natural world. They explore concepts such as how magnets work, what plants need to live, and how animals protect themselves. By asking questions, making predictions, and identifying characteristics of things in their world, who can predict where their investigations will take them?
SUBJECT AREA: Science

PreK - Kindergarten

Business is Booming (PreK-K)
How do we use money in our world? Why do people use banks? Through dramatic play, manage a bank, run a grocery store, design a business and more. Learn about deposits and withdrawals, investing, and saving using your own checkbook. Create your own currency and explore a play banking system to understand how money fits into our everyday world.
SUBJECT AREA: Math

Kid Chemists (Pre-K)
How does a substance’s phase affect how it looks, feels and acts? Did you know there are actually four states of matter? Discover the exciting world of chemistry through the study of the properties and interactions of substances. Young chemists conduct hands-on, age-appropriate experiments and watch engaging demonstrations to discover what composes matter in its various states. Chemical bonding and reactions add an “element” of surprise to this investigation into the chemistry that surrounds us.
SUBJECT AREA: Science

Robots & Roadways (PreK-K)
How do we tell robots what to do? Using age-appropriate technology tools such as BeeBots®, learn how to tell robots where to go and what to do when they don’t listen. Write your own programs and represent that code in a variety of ways using words and symbols. Through hands-on activities, role play, and acquisition of basic programming vocabulary, students build an early foundation for future computer science experiences.
SUBJECT: Computer Science & Technology, Design & Engineering

Kindergarten - Grade 1

Intro to Coding: Stories & Sequences (K-1)
What is an algorithm? How do we use them? Design and build animated stories, games and more using age-appropriate, graphical block-based applications such as Scratch Jr. and Hopscotch. Through hands-on, unplugged experiences, as well as screen-based activities, develop the vocabulary, critical thinking and problem-solving skills needed for future coding courses, and interact with technology in an active way.
SUBJECT: Computer Science & Technology

Electronics: Circuits & More (K-1)
What is a circuit? Budding engineers investigate how components connect to make working electronics as they power motors, make LEDs shine, move wheels, and activate buttons. Combining hands-on introductory electronics tools with everyday objects students develop their own moving and blinking creations. Class projects develop the building block skills needed for future coding, robotics, and engineering courses.
SUBJECT: Computer Science & Technology, Design & Engineering
Mathemagicians (K-1)
How can you solve number problems using special tricks? Explore the four main operations of addition, subtraction, multiplication, and division through hands-on math activities and games. Understand and develop a toolbox of math “tricks” for fast and accurate whole number computation. Solve a range of number problems and puzzles using strategies like estimation, mental computation, and equal grouping. Create original math computation problems using the special strategies investigated in class.
SUBJECT AREA: Math

Grades 1 – 2

Neuroscience in Action: The Brain & Our Senses (Gr. 1-2)
How does our body talk to our brain? How do we hear? Why do certain smells make us hungry? 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, observe how our brain receives sensory information from our body, and what it does with that information.
SUBJECT AREA: Science

Chronicles of Mythological Creatures (Gr. 1-2)
How do legends about mythical creatures relate to aspects of Earth, nature and our solar system? Why are myths and legends still important today? Travel back in time to ancient cultures using stories of dragons and other mythical creatures. Explore the best of mythology and watch mythical beings come alive. Trace the origin of tales and characters of all kinds. BEWARE! Your imagination may run wild as you create original mythical stories.
SUBJECT AREAS: English & Language Arts, Humanities

Brain Busters (Gr. 1-2)
What makes a problem or puzzle challenging? Collaborate with other bright kids to solve brain teasers and puzzles. Create original optical illusions and fractal images, and solve math and logic-based riddles. Invent new brain busters for family and friends to solve. Critical thinking strategies, logical thinking skills and applications of multiplication, division, and number concepts are the base for this interactive class.
SUBJECT AREA: Math

Game Design & Construction (Gr. 3-4)
How do designers develop, build and playtest games? 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, gathering feedback and the iterative process as they choose and refine their own game themes and mechanics to maximize the fun. By the end of the course, young designers create a variety of games, such as video games, board games and/or card games.
SUBJECT: Computer Science & Technology
Grades 4 - 5

Creative Writing: Idea to Publication (Gr. 4-5)
How do story ideas come to life?
Brainstorm original story concepts, and follow the writing process from draft to finished story. Experience thinking and writing like a published author by exploring different genres and story formats of classic and modern fiction, including novels and poetry. Develop facility with writing tools such as imagery, dialogue, and voice. Participate in weekly peer-led writers' workshops to receive and provide feedback to further develop your original portfolio.
SUBJECT AREAS: English & Language Arts, Humanities

Pre-Algebra: Geometry & Measurement (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

Forensic Investigations (Gr. 4-5)
How can science uncover the truth in criminal investigations?
Forensic Scientists use skills and techniques that come from a variety of disciplines—logic, mathematics, biology, chemistry, physics, and technology—to solve mysteries. Fine tune your observational and code-breaking skills in this hands-on class. Role play a forensics team investigating an active crime scene and learn the science behind forensic tests. Labs may include trace analysis of hair, fiber, stain, epithelial cells, fingerprints, and DNA.
SUBJECT AREA: Science

Grades 5 - 7

Biomimicry: Nature-Inspired Design & Engineering (Gr. 5-7)
How is design inspired by nature?
Biomimicry is the science that studies nature's best ideas and then applies those designs and processes to solve human problems. In this hands-on design studio learn how to use a biomimetic approach to identify an everyday problem and create a sustainable solution. Research strategies and patterns found in nature and apply those to the design process. Sketch and build low-fidelity prototypes, deliver presentations, and create a design portfolio.
SUBJECT AREA: Science

Integrated Math: Sequences, Functions, Data Analysis, Correlations, & Modeling (Gr. 5-7)
How can we connect patterns, relations, and functions so that they make sense?
Where and when do we actually use algebra in the world, and how is it connected to the other strands of math? By analyzing and integrating mathematical methods taken from algebra, geometry, statistics and probability, learn how to use math as a reasoning tool outside of the classroom. With a problem-based, student-centered approach, apply quantitative thinking to real-world scenarios and engage in collaborative exploration of realistic problems with other math-minded classmates.
SUBJECT AREA: Math

Grades 6 - 8

Microcontrollers in Action: Programming & Electronics (Gr. 6-8)
How are hardware and programming connected?
Delve into the world of physical computing to understand how hardware and programming together make electronics come to life. Discover how to incorporate lights, motors, buttons, and sensors in this student-driven, project-based class. Using circuit boards and microcontrollers such as the Raspberry Pi or Arduino, write and test code for your hardware projects using languages such as JavaScript, Python, and Scratch.
NOTE: there is a $30 materials fee for this course.
SUBJECT: Computer Science & Technology

Interactive Programming: Python & Robots (Gr. 6-8)
How can seeing a physical representation of our code help us gain proficiency with a programming language?
Python is a widely used commercial language with copious real-world applications including 3D graphics applications, scientific research, games, web apps, and industrial robotics. It is also ideal for learning the fundamentals of object-oriented programming, which can be applied to other languages like Java and C++. Learn to use Python in a hands-on manner by programming a robot to move, draw and respond to its environment. Students gain facility with the language by creating interactive programs using functions, loops, recursion, and decision statements.
SUBJECT: Computer Science & Technology

Persuasion & Debate: Reason & Logic (Gr. 6-8)
How do debaters back their arguments with evidence?
In a workshop format, students research evidence to support their claims and engage in debate techniques grounded in rhetorical tradition. Preparation and presentation, body language, the vocal mechanism and the debate process are covered, along with active listening skills, identification of logical fallacies and argumentative writing. Topics are student-generated and provide opportunities for participants to develop and improve their persuasive communication skills.
SUBJECT AREAS: English & Language Arts, Humanities
Lab Science: Biology (Gr. 6-8)
What do the structure, function, and behavior of organisms reveal about life on our planet?
Students are introduced to a range of important biological concepts using current best practices, presentations and project-based laboratory experiments. Topics include biochemistry, microbiology, cell structure, cellular reproduction, DNA, genetics, evolution and ecology.
NOTE: Additional $50 materials fee required.
SUBJECT: Science

FUSE: Design Studio & Maker Space (Gr. 6-8)
How do you apply the design process to both physical and 2-dimensional products?
Select design challenges from a variety of fields, such as electronics, robotics, biotechnology, architecture, sound mixing, or fashion design to create products that use STEAM-based practices (science, technology, engineering, arts/design and mathematics) and develop problem solving, creativity, and persistence. The challenges, developed by researchers and educators in the School of Education & Social Policy at Northwestern University, are open-ended and student-driven, encouraging independent and collaborative problem solving. With the help of an expert facilitator, you’ll produce and present your digital media artifacts for peer review, remixing, and expert feedback.
NOTE: Additional $25 materials fee required.
SUBJECT: Computer Science & Technology, Design & Engineering