2020 COURSE DESCRIPTIONS

Online Family Program SUMMER SESSIONS

PreK - Grade 5, Four-Week Courses

The Online Family Program (OFP) offers high-interest learning opportunities for academically advanced students. CTD’s online instructors guide students and parents through challenging lessons that include hands-on activities and meaningful exchanges within the online classroom community. There are no test scores or further documentation required for participation in the Online Family Program.

Students work with a parent or an adult caregiver on engaging course activities. Courses feature:

- 3-6 hours of coursework and activities per week, depending on student age and interest.
- Flexibility - content is available any time of day, any day of the week. **There are no live video sessions with the instructor.**
- Individualized guidance from instructors through posted feedback on the work that students share during the course.
- Parent/caregiver participation - courses for younger students typically involve more parent participation than courses for older students.

Program Dates

- June 12 – July 10
- July 17 – August 14

Tuition: $150

**Online Family Program Application:** Visit My.CTD.Northwestern.edu to begin your application. 
For more information, please visit the website or contact CTD-admissions@northwestern.edu

<table>
<thead>
<tr>
<th>Grade</th>
<th>Courses offered June 12 – July 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>PreK</td>
<td>Building &amp; Fixing</td>
</tr>
<tr>
<td>K – 1</td>
<td>Body Basics: Cells &amp; Skeletons</td>
</tr>
<tr>
<td>K – 1</td>
<td>Coding with Scratch Jr &amp; Hopscotch</td>
</tr>
<tr>
<td>K – 1</td>
<td>Kitchen Chemistry</td>
</tr>
<tr>
<td>K – 1</td>
<td>Are You My Perfect Pet? Mathematical Decision-Making</td>
</tr>
<tr>
<td>K – 1</td>
<td>Math Inside &amp; Out</td>
</tr>
<tr>
<td>2 – 3</td>
<td>Math of Sports &amp; Bio-Measurement</td>
</tr>
<tr>
<td>2 – 3</td>
<td>Playing Geometry: Spatial Reasoning for the Fun of it</td>
</tr>
<tr>
<td>2 – 3</td>
<td>Digital Game Design</td>
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<tr>
<td>2 – 3</td>
<td>Brain Surgery</td>
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<tr>
<td>2 – 3</td>
<td>Business Basics</td>
</tr>
<tr>
<td>2 – 3</td>
<td>LEGO Architecture: Landmark Designs</td>
</tr>
<tr>
<td>4 – 5</td>
<td>Stock Market</td>
</tr>
<tr>
<td>4 – 5</td>
<td>Digital Architects</td>
</tr>
<tr>
<td>4 – 5</td>
<td>3D Cell Biology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>Courses offered July 17 – August 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>PreK</td>
<td>Growing &amp; Eating Food</td>
</tr>
<tr>
<td>K – 1</td>
<td>Kitchen Math</td>
</tr>
<tr>
<td>K – 1</td>
<td>Zoo Vets</td>
</tr>
<tr>
<td>K – 1</td>
<td>Puppet Productions</td>
</tr>
<tr>
<td>K – 1</td>
<td>Are You My Perfect Pet? Mathematical Decision-Making</td>
</tr>
<tr>
<td>K – 1</td>
<td>Math Inside &amp; Out</td>
</tr>
<tr>
<td>K – 1</td>
<td>Puzzle Party</td>
</tr>
<tr>
<td>2 – 3</td>
<td>Circuit Breakers &amp; Makers</td>
</tr>
<tr>
<td>2 – 3</td>
<td>Brain Surgery</td>
</tr>
<tr>
<td>2 – 3</td>
<td>Fractions: Beyond Pizza</td>
</tr>
<tr>
<td>2 – 3</td>
<td>Playing Geometry: Spatial Reasoning for the Fun of it</td>
</tr>
<tr>
<td>2 – 3</td>
<td>Comic Book Characters</td>
</tr>
<tr>
<td>4 – 5</td>
<td>Web Design</td>
</tr>
<tr>
<td>4 – 5</td>
<td>Survivor Math</td>
</tr>
<tr>
<td>4 – 5</td>
<td>3D Cell Biology</td>
</tr>
</tbody>
</table>
PreK to Grade 5
(grade level on January 1, 2020)

PreK
CTD’s Online courses for children ages 3 - 5 stimulate children’s creative thinking and problem-solving skills by integrating math, science, engineering, and language arts. During this course, children engage in hands-on, playful learning experiences with a parent or caregiver. Parents participate in activities with children and post observations and questions for the class and the teacher. Teachers provide feedback and extensions to support guided, playful learning.

Building & Fixing (PreK)
In this course, young children and their parents read the story, “The Three Little Pigs” to inspire explorations about construction materials and architectural design. Children also learn about design engineering and problem-solving as they work in their Fix-It Shop. Young tinkerers build understanding of how things break, how fixing things solves problems, and how mistakes are often opportunities to learn something new.
Session: June 12 – July 10

Growing & Eating Food (PreK)
In this course, young children and their parents read the story "The Carrot Seed," by Ruth Krauss, to inspire playful exploration of the life cycle of plants, as well as the benefits of patience and perseverance. They also learn about cooking and selling food when they create their own food truck.
Session: July 17 – August 14

Kindergarten - Grade 1

Body Basics: Cells & Skeletons (K - 1)
In this course, young scientists and their parents or caregivers explore basic human biology by focusing on the systems and cells of the human body. Students learn to identify major body systems as well as the structure and function of the cells in different systems. Using household materials, students will create models, illustrate organs and act out the processes going on inside our bodies every day.
Session: June 12 – July 10

Coding with Scratch Jr & Hopscotch (K - 1)
In this course, coders learn computer science concepts such as sequence, loop, conditions and troubleshooting as they bring to life interactive digital stories and games using Scratch Jr and Hopscotch. Using coding apps as well as traditional methods like drawing, writing and dramatization, families develop logical and creative thinking skills as they create and share content.
Session: June 12 – July 10

Kitchen Chemistry (K – 1)
Cook up some fun while exploring many chemical processes behind food preparation. Satisfy your hunger for knowledge using the scientific method to make hypotheses, measure data, and form conclusions with your family!
Session: June 12 – July 10

Are You My Perfect Pet? Mathematical Decision-Making (K – 1)
Freddy the Great is a great dane who stands over seven feet tall, weighs over 200 pounds and holds the title of world’s largest 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 and caregivers calculate and compare, building computation and data skills as they find the solutions to the mathematical problems of pet ownership.
Sessions: June 12 – July 10 & July 17 – August 14

Math Inside & Out (K – 1)
Math is everywhere. It’s at the breakfast table and outside our front door. We play with math on the playground and while we play board games. Mathematicians and their parents or caregivers have fun with the real-life math that’s used for telling time, working in the kitchen, understanding weather and enjoying games. Together, they explore how numbers and units can help us accurately predict and describe everyday experiences, anywhere and everywhere!
Sessions: June 12 – July 10 & July 17 – August 14

Kitchen Math (K – 1)
Measuring, timing, comparing, and computing are on the menu as students and their parents use numbers to do the work of cooks and bakers. Students develop
their mathematical thinking, including computation and fractions to create recipes and equations.

Session: July 17 – August 14

Puzzle Party (K – 1)

Students and their families celebrate math with brain-teasing and brain-building activities. Puzzles, tangrams, mazes, and riddles challenge students to see patterns and seek solutions using computation, logic and deduction.

Session: July 17 – August 14

Zoo Vets (K – 1)

Junior veterinarians and their parents or caregivers investigate life sciences by focusing on zoo animals. They classify animals and compare animals’ characteristics. Students delve into what animals need to survive and how zoo vets help them, for example by creating the right kinds of zoo habitats and providing a healthy diet. Students develop their reasoning skills to think like zoo vets.

Session: July 17 – August 14

Puppet Productions (K – 1)

Puppets help us become better storytellers. Working with their parents or caregivers, young storytellers learn about character, story sequence, and the structure of puppet plays. Students engage in storytelling, role-playing, and vocabulary activities, and they extend their organizational and language skills as they create and share stories.

Session: July 17 – August 14

Grades 2 – 3

Brain Surgery (2 – 3)

Young neurologists and their families 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 understanding of the nervous system as a whole.

Sessions: June 12 – July 10 & July 17 – August 14

Digital Game Design (2 – 3)

We all have our favorite board games, card games and video games. In this course, students and their families are challenged to analyze what makes a game the one we really want to play, both around the table and on the screen. As a game writer, students learn and apply design thinking and block coding skills to create their ideal digital game designs. To revise and improve their game, they’ll compare and contrast their own digital game design with 3D game designs, and gather feedback from classmates.

Session: June 12 – July 10

LEGO Architecture: Landmark Designs (2 – 3)

What makes a structure a landmark rather than just a building? Is it its distinctive features? 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. Young designers and their parents will learn about architectural elements and engage in the design process as they take on building challenges using LEGO bricks and other household materials. Participants apply concepts of engineering, art, and urban planning to create their own landmark designs.

Session: June 12 – July 10

Business Basics (2 – 3)

Crunching the numbers is one way business people put a great idea to work. Entrepreneurs combine inspiration and critical thinking with math skills to start up and run companies. Business rookies boost their business savvy as they build their computation and data analysis skills learning about how to determine a budget, set prices, calculate profits & losses and more.

Session: June 12 – July 10

Math of Sports & Bio-Measurement (2-3)

Math isn’t confined to a classroom in school. It’s in our blood, at the heart of measuring our bodies’ capacities and athletic performance. It comes with us as we rest, work and play. Young mathematicians and their parents or caregivers have fun with the real-life math of sports medicine and their favorite sports.

Session: June 12 – July 10

Playing Geometry: Spatial Reasoning for the Fun of It (2 – 3)

As our spatial visualization skills improve, so do skills in math and other academic areas. As with other things we do for fun, we get better at spatial reasoning with practice, so let’s play geometry! Students and their families are invited to expand their understanding of the Platonic solids and exercise visualization skills through playful challenges and projects.

Sessions: June 12 – July 10 & July 17 – August 14

Kitchen Chemistry (K – 1)

Cook up some fun while exploring many chemical processes behind food preparation. Satisfy your hunger for knowledge using the scientific method to make
hypotheses, measure data, and form conclusions with your family!

Session: June 12 – July 10

Fractions: Beyond Pizza (2 – 3)
One way to see (and eat) fractions is as the slices of a pizza. But there are many other ways to view parts of a whole in the structures and situations of our daily lives. Building onto their math skills, students construct both two and three-dimensional models to explore and deepen their ideas about fractions and proportion. They explore methods for determining fractions of regular and irregular shapes. And they use these skills to describe and solve problems in their own households and neighborhoods by comparing, adding, subtracting and multiplying fractions.

Session: June 12 – July 10

Circuit Breakers & Makers (2 – 3)
Electricity is all around us. We use it to play, but we are warned not to play with it. In this course families have fun investigating simple circuits by making and breaking them. Using basic materials and their imaginations, students learn the fundamentals of electricity and how to think like electrical engineers. To complete all activities in this course, participants will have to purchase basic supplies to create circuits such as wire, battery, bulb and/or at least one circuit-building app for a tablet or a phone.

Session: July 17 – August 14

Comic Book Characters (2 – 3)
Cook up some fun while exploring many chemical processes behind food preparation. Satisfy your hunger for knowledge using the scientific method to make hypotheses, measure data, and form conclusions with your family!

Session: July 17 – August 14

Web Design (4-5)
In this course, students use a web design tool kit while planning and designing for the screen. Focusing on a topic of high interest for their web page, student web designers will learn how HTML and CSS are used and extend their design and programming skills by creating webpages using fun and powerful software, which may include Photoshop, Flash, Adobe Dreamweaver, and Notepad++. Students improve their work by analyzing existing webpages, and by receiving feedback from classmates.

Session: July 17 – August 14

Stock Market (4-5)
What is the stock market? What is the difference between the NYSE and the Nasdaq? And what exactly are people buying and selling there? Students explore these questions and more as they learn about stock shares, dividends, stockbrokers, stockholders and stock exchanges. Students role-play investors as they purchase stocks, follow their investments, and make decisions based on market indicators. They’ll also grow their computational and critical thinking skills as they ‘play the market’ in this course.

Session: June 12 – July 10

Survivor Math (4-5)
Applying math skills is the key to survival in this creative problem-solving course. Students role-play a variety of exciting scenarios, such as being marooned on a desert island, trapped in a space station or stranded in a deadly snowstorm. Students and parents analyze what the situation calls for and then apply formulas and concepts from geometry, algebra and probability, extending their mathematical thinking skills as they save the day in this course.

Session: July 17 – August 14

Grades 4-5

3D Cell Biology (4-5)
Cells are often described as “the building blocks of life.” In this introductory biology course, students use LEGO® bricks and other 3D construction tools to learn about the structure of various living cells and of DNA molecules. Students examine virtual cell structures, observe virtual cell reproduction, and study the laws of genetic inheritance as they build up their critical thinking skills and knowledge of microbiology.

Session: June 12 – July 10 & July 17 – August 14

Digital Architects (2 – 3)
Explore the architectural design process using math, physics, and visual-spatial reasoning skills. Through hands-on building projects, blueprint sketching, and digital modeling software (SketchUp for Web), novice architects investigate how buildings come to be and how people interact with the built environment.

Session: June 12 – July 10