Center for Talent Development

Summer Program

Rigorous academic challenge with life-changing impact

2015 Program Catalog
Students Age 4 through Grade 12

www.ctd.northwestern.edu
847/491-3782, ext. 2
summer@ctd.northwestern.edu
Welcome to the 2015 Summer Program

The CTD Summer Program allows gifted students to delve deep into a subject of intrigue, build upon their strengths and connect with a community of peers. From fast-paced enrichment options to accelerated, credit-bearing offerings, there is something for everyone!

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Contact Information
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Northwestern University

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Center for Talent Development has been accredited as a nonpublic supplementary school by the North Central Association Commission on Accreditation and School Improvement (NCA CASI) since April 1, 1994. NCA CASI is recognized by the U.S. Department of Education and has more than 100 years of experience in improving educational quality.
2015 Summer Program at a Glance

Application period opens January 15, 2015

• Take advantage of Early Application tuition rates through April 15, 2015.
• Regular tuition rates apply starting April 16, 2015.

Apply early!
Courses are filled on a first-come, first-served basis and many courses fill well before the application deadline.

STUDENTS AGE 4 (PreK)–GRADE 3 (grade level on January 1, 2015)

Leapfrog Program
Leapfrog provides enrichment courses for students who have demonstrated a keen, early interest in learning. Half or all-day, one-week courses are offered mornings and afternoons. Detailed program information begins on page 4. The Leapfrog program site locations are listed on the Summer Program website.

New in 2015!
• New options for students in grades 3 and 4 in combination with the Spark program

Program Dates:
June 22–26
Week 1, Leapfrog Favorites in Skokie and Lake Forest, morning only; all-day courses in Elmhurst

June 29–July 3
Week 2, Leapfrog Favorites in Chicago and Naperville, morning only; all-day courses in Elmhurst

July 6–10
Week 3, all sites; morning, afternoon and all-day courses*

July 13–17
Week 4, all sites; morning, afternoon and all-day courses*

July 20–24
Week 5, all sites except Elmhurst; morning, afternoon and all-day courses*

Sites:
Chicago, Elmhurst, Lake Forest, Naperville, Palatine and Skokie

* Availability of afternoon and all-day courses varies by site.
2015 Summer Program at a Glance

GRADES 4–6 (grade level on January 1, 2015)
Three program options: Spark (1 week), Solstice (2 weeks) or Apogee (3 weeks)

Spark Program
Spark is a week of fun, mind-stretching learning experiences. Detailed program information begins on page 13.

Program Dates and Locations:
Elmhurst College, Elmhurst, IL
Monday, June 22–Friday, June 26
Monday, June 29–Friday, July 3
Monday, July 6–Friday, July 10 Monday, July 13–Friday, July 17
Lake Forest
Monday, July 6–Friday, July 10
Monday, July 13–Friday, July 17

Solstice Program
The Solstice program offers enrichment courses in a two-week timeframe perfect for extended study of a subject. Students at the Northwestern University site may choose to live on campus. Detailed program information begins on page 20.

Elmhurst College, Elmhurst, IL (commuter only)
Program Dates:
Monday, June 22–Friday, July 3
Monday, July 6–Friday, July 17

Skokie
Monday, July 6–Friday, July 10
Monday, July 13–Friday, July 17
Monday, July 20–Friday, July 24
Chicago
Monday, July 13–Friday, July 17
Palatine
Monday, July 6–Friday, July 10

Northwestern University, Evanston, IL
(residential and commuter)
Program Dates:
Sunday, June 28–Friday, July 10
Sunday, July 12–Friday, July 24
Sunday, July 26–Friday, August 7

Apogee Program
The three-week Apogee program gives students the opportunity to take a fast-paced enrichment course that hones critical academic skills and deepens knowledge and understanding of a particular subject. Students may choose to reside on the Northwestern University Evanston, Illinois campus. Detailed program information begins on page 20.

Northwestern University, Evanston, IL
(residential and commuter)
Program Dates:
Sunday, June 28–Friday, July 17
Sunday, July 19–Friday, August 7
GRADES 7 & 8* (grade level on January 1, 2015)

Spectrum Program
Spectrum offers three-week, in-depth enrichment and accelerated honors courses that stretch young minds and provide challenge beyond grade level. Honors courses bear high school credit. Detailed program information begins on page 28.

* Students in grade 9 may apply; applications will be considered on a case-by-case basis.

Northwestern University, Evanston, IL
(residential and commuter)

Program Dates:
Sunday, June 28–Friday, July 17
Sunday, July 19–Friday, August 7

GRADES 9–12 (grade level on January 1, 2015)

Equinox Program
Equinox combines fast-paced, advanced coursework with the chance to explore college and careers in a hands-on way. Courses offer students the opportunity to earn high school credit at the honors and Advanced Placement® (AP) levels. Students can experience life on the Northwestern University, Evanston, Illinois campus as a residential participant or commute from home. Detailed program information begins on page 35.

Northwestern University, Evanston, IL
(residential and commuter)

Program Dates:
Sunday, June 28–Friday, July 17
Sunday, July 19–Friday, August 7
Sunday, June 28–Friday, July 31
(5-week Advanced Placement® science courses)

Civic Leadership Institute
The Civic Leadership Institute combines an innovative service-learning curriculum with an unforgettable residential experience in the heart of downtown Chicago. The program helps outstanding high school students develop the knowledge, experience and leadership skills they need to make a positive impact on the world. Details begin on page 42.

Chicago, IL
(residential only)

Program Dates:
Sunday, July 5–Friday, July 24
Leapfrog & Spark Programs

Age 4 (PreK)–Grade 4
(grade level on January 1, 2015)
Leapfrog and Spark courses engage students age 4 (PreK) through grade 4 in challenging academic adventures. Hands-on activities help children with demonstrated strength in math or verbal areas acquire and practice new concepts in unique and interesting ways. Each Leapfrog and Spark course is designed to accommodate two grade levels: PreK/K, 1/2, 2/3 or 3/4. This structure provides more course options and allows students with similar skills and abilities to be grouped together. Enrollment in PreK through K/1 courses is approximately 16 students; grades 1/2, 2/3 and 3/4 courses accommodate approximately 18 students.

Apply Early! Application Period Begins January 15, 2015

Courses are offered in Chicago, Elmhurst, Lake Forest, Naperville, Palatine and Skokie. For specific locations, please see the Summer Program website. You may enroll your child in one or multiple weeks of Leapfrog and Spark courses.

There are three different types of course offerings:

- **Half-day A.M.** Leapfrog courses meet from 9 a.m. to 12 noon daily for five consecutive days (Monday through Friday).
- **Half-day P.M.** Leapfrog courses meet from 1 p.m. to 4 p.m. Monday through Friday.
- **All-day** Leapfrog and Spark courses are available for students in grades 2/3 (Leapfrog) and grades 3/4 (Spark). All-day classes meet from 9:15 a.m. to 3:45 p.m. with a break for lunch (except in Elmhurst, where courses meet from 8:30 a.m. to 2:45 p.m.). See page 13 for details.

Note:
- Parents/guardians may enroll their children in an A.M. course, a P.M. course or both. Lunch/recess: All students enrolled in both an A.M. course and a P.M. course are automatically enrolled in the 12 noon to 1 p.m. lunch/recess at no extra cost.

Program Dates:
- **Week 1:** June 22–26
  - Leapfrog Favorites in Skokie & Lake Forest, Leapfrog & Spark
  - All-day in Elmhurst
- **Week 2:** June 29–July 3
  - Leapfrog Favorites in Chicago & Naperville, Leapfrog & Spark
  - All-day in Elmhurst
- **Week 3:** July 6–July 10
  - All sites
- **Week 4:** July 13–July 17
  - All sites
- **Week 5:** July 20–July 24
  - All sites except Elmhurst

“The instructor really made him feel connected to the subject and made it the best class ever!”

—2014 Leapfrog parent
Leapfrog Half-day Course Reference Chart

Enroll your child in a course for his or her grade level as of January 1, 2015. Select course topics that best fit your child’s academic strengths as determined through test scores and/or other academic measures.

**Leapfrog Favorites Courses**
W1 = Week 1: June 22–26
W2 = Week 2: June 29–July 3

<table>
<thead>
<tr>
<th>COURSE NUMBER (Grade Level)</th>
<th>COURSE TITLE</th>
<th>SUBJECT AREA</th>
<th>LF AM</th>
<th>SK AM</th>
<th>CH AM</th>
<th>NP AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (PreK/K)</td>
<td>Yellow Submarine</td>
<td>English &amp; Language Arts</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
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<tr>
<td>A (1/2)</td>
<td>Shark Attack!</td>
<td>English &amp; Language Arts</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
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<tr>
<td>B (K/1)</td>
<td>Bank on It</td>
<td>Mathematics</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
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<tr>
<td>B (1/2)</td>
<td>Math for Spies</td>
<td>Mathematics</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
</tr>
<tr>
<td>B (2/3)</td>
<td>Brain Twisters</td>
<td>Mathematics</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
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<tr>
<td>C (PreK/K)</td>
<td>Building Bridges</td>
<td>Science</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
</tr>
<tr>
<td>C (K/1)</td>
<td>Awesome Explosions &amp; Collisions</td>
<td>Science</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
</tr>
<tr>
<td>C (2/3)</td>
<td>Kitchen Chemistry</td>
<td>Science</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
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<tr>
<td>D (PreK/K)</td>
<td>Story Code Alpha</td>
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<td>W1</td>
<td>W2</td>
<td>W2</td>
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<td>D (K/1)</td>
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<td>D (1/2)</td>
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<td>W1</td>
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<td>D (2/3)</td>
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<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
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<tr>
<td>F (PreK/K)</td>
<td>Bee-Bot® Town</td>
<td>Design &amp; Engineering</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
</tr>
<tr>
<td>F (K/1)</td>
<td>Primo Paths</td>
<td>Design &amp; Engineering</td>
<td>W1</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
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<tr>
<td>F (1/2)</td>
<td>Hexbug® Habitats</td>
<td>Design &amp; Engineering</td>
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<td>W1</td>
<td>W2</td>
<td>W2</td>
</tr>
<tr>
<td>F (2/3)</td>
<td>WeDo Go!</td>
<td>Design &amp; Engineering</td>
<td>W1</td>
<td>W1</td>
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**Week 3: Half-day Courses**
July 6–10

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<tr>
<th>COURSE NUMBER (Grade Level)</th>
<th>COURSE TITLE</th>
<th>SUBJECT AREA</th>
<th>CH AM</th>
<th>CH PM</th>
<th>LF AM</th>
<th>LF PM</th>
<th>NP AM</th>
<th>NP PM</th>
<th>PA AM</th>
<th>PA PM</th>
<th>SK AM</th>
<th>SK PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-A (PreK/K)</td>
<td>If I Ran the Zoo</td>
<td>English &amp; Language Arts</td>
<td>X</td>
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<td>X</td>
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<td>3-A (K/1)</td>
<td>African Safari</td>
<td>English &amp; Language Arts</td>
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<td>3-A (1/2)</td>
<td>Survivor: Ancient Egypt</td>
<td>English &amp; Language Arts</td>
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<td>X</td>
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<tr>
<td>3-A (2/3)</td>
<td>Life on Mars</td>
<td>English &amp; Language Arts</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>3-B (PreK/K)</td>
<td>Playground Math</td>
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<td>3-B (K/1)</td>
<td>Blocks &amp; Blueprints</td>
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<tr>
<td>3-C (PreK/K)</td>
<td>My Magnifying Glass</td>
<td>Science</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>3-C (K/1)</td>
<td>Grab Your Binoculars</td>
<td>Science</td>
<td>X</td>
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(Week 3: Half-day Courses continued on next page)
## Week 3: Half-day Courses Continued
### July 6–10

<table>
<thead>
<tr>
<th>COURSE NUMBER (Grade Level)</th>
<th>COURSE TITLE</th>
<th>SUBJECT AREA</th>
<th>CH AM</th>
<th>CH PM</th>
<th>LF AM</th>
<th>LF PM</th>
<th>NP AM</th>
<th>NP PM</th>
<th>PA AM</th>
<th>PA PM</th>
<th>SK AM</th>
<th>SK PM</th>
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<tbody>
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<td>3-C (1/2)</td>
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<tr>
<td>3-C (2/3)</td>
<td>Under the Microscope</td>
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<td>X</td>
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<td>3-D (PreK/K)</td>
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<tr>
<td>3-D (1/2)</td>
<td>Story Code Gamma</td>
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<td>3-D (2/3)</td>
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<td>3-F (PreK/K)</td>
<td>Bee-Bot® Town</td>
<td>Design &amp; Engineering</td>
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<td>3-F (K/1)</td>
<td>Primo Paths</td>
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<td>3-F (1/2)</td>
<td>Hexbug® Habitats</td>
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<tr>
<td>3-F (2/3)</td>
<td>WeDo Go!</td>
<td>Design &amp; Engineering</td>
<td>X</td>
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## Week 4: Half-day Courses
### July 13–17

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<tr>
<th>COURSE NUMBER (Grade Level)</th>
<th>COURSE TITLE</th>
<th>SUBJECT AREA</th>
<th>CH AM</th>
<th>CH PM</th>
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<th>PA AM</th>
<th>PA PM</th>
<th>SK AM</th>
<th>SK PM</th>
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<tbody>
<tr>
<td>4-A (PreK/K)</td>
<td>Puppet Productions</td>
<td>English &amp; Language Arts</td>
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<td>4-A (K/1)</td>
<td>Make Me Laugh</td>
<td>English &amp; Language Arts</td>
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<tr>
<td>4-A (1/2)</td>
<td>Stories in Shadow</td>
<td>English &amp; Language Arts</td>
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<td>4-A (2/3)</td>
<td>Scene Workshop</td>
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<tr>
<td>4-B (PreK/K)</td>
<td>Math for Breakfast</td>
<td>Mathematics</td>
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<tr>
<td>4-B (K/1)</td>
<td>Math Rain or Shine</td>
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<tr>
<td>4-B (1/2)</td>
<td>Math in the Animal World</td>
<td>Mathematics</td>
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### Week 5: Half-day Courses
#### July 20–24

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Leapfrog Half-day Course Descriptions

Week 1: June 22–26
Leapfrog Favorites (Skokie & Lake Forest)
A select group of our most popular Leapfrog courses will be offered at our Skokie, Lake Forest, Chicago and Naperville locations. All courses meet from 9 a.m. to 12 noon daily, Monday through Friday.

Week 2: June 29–July 3
Leapfrog Favorites (Chicago & Naperville)

English & Language Arts Favorites
Students with strong verbal ability may enroll in an English & Language Arts course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

(PreK/K) Yellow Submarine
The words to the Beatles’ song, “Yellow Submarine,” inspire students to imagine, draw, play and write about life under the waves in a sea of green. The class becomes a maritime crew as they learn the roles of pilots, navigators, explorers and scientists. Students hone their language and early writing skills through creative storytelling and dramatization.

(1/2) Shark Attack: Underwater Mythbusting
Sharks are the most feared creatures in the ocean, but actual shark attacks on people are very rare. As aspiring myth-busters, students research how and why sharks inspire fascination and fear, use critical thinking to determine the facts, and document their findings and ideas with both words and images.

Mathematics Favorites
Students with an identified strength in math may enroll in a Mathematics course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

(K/1) Bank on It: Savings & Checking
Budding bankers explore the concept of a bank and its alternatives. After delving into topics including savings, interest and checking, students practice real-world skills as they establish their own bank and set up different types of bank accounts, make deposits and withdraw money.

(1/2) Math for Spies
There’s more to being a spy than just wearing a disguise. Spies also have to be expert mathematicians. In this course, aspiring spies use math to create secret codes, plot the coordinates of enemy hideouts and discover, through logical reasoning, the identities of other spies.

(2/3) Brain Twisters: Multiplication & Fractions
Sometimes solving a math problem is like untangling a knot. Sound strategy and persistence are the keys to success! In this case, mathematical challenges keep young minds churning as they use fractions and multiplication to arrive at solutions.

Science Favorites
Students with strong math or verbal ability may enroll in a Science course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

(PreK/K) Building Bridges
Truss, arch, suspension and more! Young engineers learn about bridge structures and study famous examples from around the world. Students create their own bridge models based on the principles of physics and through the process of scientific inquiry.

(K/1) Awesome Explosions & Collisions
Physicists learn about matter by deliberately crashing particles into each other. What else can be learned from collisions and explosions? Hands-on science experiments allow students to bump, crash, and jolt a wide variety of materials. Students learn how explosive phenomena such as impact craters, plate tectonics and particle acceleration reveal a wealth of scientific knowledge.

(2/3) Kitchen Chemistry: Edible Experiments
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: Students will be handling and tasting food products in this course (not including peanuts or tree nuts). Students with food allergies are advised not to take this course. Please contact the Summer Program staff with any questions or concerns.
New! Leapfrog Half-day Technology Courses

CTD Summer Program now offers technology courses at all grade levels, starting at PreK. Leapfrog tech courses introduce young students to concepts of computer programming and robotics engineering through stories, games, and more. Courses develop a foundation of coding and problem-solving skills.

Students spend approximately one-third of each class session using tech devices such as tablets and laptops; the majority of students’ time will be spent interacting with other students and engaging in hands-on learning activities that teach coding concepts such as sequence, loop, function and conditions. Students are encouraged to use critical thinking.

Identify the appropriate course for your student based on his/her grade level on January 1, 2015. Leapfrog tech course offerings vary from site to site. Consult the reference chart on pages 5–7 for dates and locations. For all-day courses, consult the course descriptions and reference chart on pages 13–15.

Leapfrog Half-day Technology Course Descriptions

Students with strong verbal or math ability may enroll in Technology courses. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

Computer Science & Technology
Tech Tales Animation
Authors find inspiration for stories everywhere. In Leapfrog animation courses, students seek inspiration for their own stories through games, dramatic play and books as they learn to animate their creations using educational apps and computer programs. Along the way, students learn the fundamentals of coding, such as creating a sequence of commands and trouble-shooting their programs for accuracy and efficiency.

NEW! (PreK/K) Story Code Alpha
Stories can be shared in many ways: through a book, on stage, or even through computer animation. Students use touch screens and educational apps, such as Daisy the Dinosaur and Kodable, to learn introductory programming and coding concepts such as block, symbol and sequence.

NEW! (K/1) Story Code Beta
Scratch Jr. is the newest version of the educational Scratch platform. Students use Scratch Jr.—as well as traditional methods like drawing, writing and dramatization—to bring their stories to life.

NEW! (1/2) Story Code Gamma
How is a story on paper different from a story on a computer screen? Students use creativity and critical thinking to develop and present stories using apps such as Scratch Jr. and Hopscotch.

NEW! (2/3) Story Code Delta
Students create detailed narratives with multiple characters and settings. They learn to animate their stories using Scratch Jr. and/or the original Scratch programming language.

Design & Engineering
Robot Stories
Robots are everywhere: washing your car at the drive-through car wash, scanning your suitcases at the airport, and in your house vacuuming your rug. You might not recognize robotic machines because not all robots have faces and voices. Leapfrog robotics courses teach children the elements of a robot: machines with a motor and a power source (such as electricity) that can move and perform functions and that are programmed by a computer or an internal computer chip.

NEW! (PreK/K) Bee-Bot® Town
Bee-Bots® are educational robots designed to introduce young children to computer programming. Students practice and demonstrate introductory coding concepts such as symbol, sequence, and loop as they create homes and roads for their Bee-Bot® friends.

NEW! (K/1) Primo Paths
“Tangible programming” means students use devices and objects they can move, manipulate and hold to create computer codes. One example is the Primo robot, which students control by placing colorful blocks into a line. In this course, students are also introduced to the coding concept of function.

NEW! (1/2) Hexbug® Habitats
Hexbug® toys are a fascinating example of biorobotics, the study of how to make robots that simulate living organisms. Students analyze the form and function of various Hexbug® creatures and build habitats that demonstrate each robot’s unique characteristics.

NEW! (2/3) WeDo Go!
Students build and program simple robots using LEGO® WeDo robotics kits. This course provides an introductory pathway to more advanced LEGO® robotics experiences.

“My son came home and told me that he was finally in a class that was tough and he really liked it.”

—2014 Leapfrog parent
Leapfrog Weeks
3–5 Half-day Course Descriptions

English & Language Arts Courses

Students with strong verbal ability may enroll in an English & Language Arts course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

Week 3 (July 6–10)
You’re in the Story
Stories are a powerful way to communicate ideas, emotions and information. A variety of settings, from a safari in Kenya to a space station on Mars, provide the backdrop for students to create and act out their own stories. Students strengthen language and literacy skills through dramatic play, creative writing and storytelling, reading and research, and collaborative problem solving.

(PreK/K) If I Ran the Zoo
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 zookeepers 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.

(K/1) African Safari
As photographers on a safari trip to Kenya, students learn about African topography and the animals that are found in Kenyan game reserves. Students imagine and create their own fictional game reserve, map it, research the local Maasai culture, and create a safari guidebook. Along the way, the wildlife photographers will encounter a variety of challenges that they must discuss, research and solve together.

(1/2) Survivor: Ancient Egypt
By creating a story about a community that lives in the Nile River Valley, students investigate the lives and lifestyles of the ancient Egyptians. While role-playing members of Egyptian families, students learn about culture and history as well as how to survive hardships such as drought. The creation of stories, murals, skits and posters challenge students to communicate their ideas using a variety of skills and mediums.

(2/3) Life on Mars
A space colony is going to be established on Mars. Students take on the roles of young astronauts preparing to live together in a strange new world. What will they need to bring? How will they prepare for their journey? Students work together, researching and writing their ideas and plans, to determine how the colony will be established and then blast off on their imaginary journey.

Week 4 (July 13–17)
Leapfrog Theater
Performance and writing skills merge to create exciting storytelling opportunities for students. Students sharpen their skills in language, writing, and perspective taking as they create and share stories about their favorite topics.

(PreK/K) Puppet Productions
Young storytellers learn about character, sequence, and the structure of puppet plays. Through storytelling, role-playing and vocabulary activities, students extend their literacy skills.

(K/1) Make Me Laugh
Students learn new ways to share their sense of humor through word play and comedy performance. Story development, joke structures and performance techniques are just some of the hilarious skills students discover and build.

(1/2) Stories in Shadow
Using light and shadow, students explore new dimensions in storytelling. Students learn about shadow puppets across time and cultures, as well as the roles of light and shadow in stories and literature. Through reading, writing and storyboarding, students create and perform their own stories of shadow and light.

(2/3) Scene Workshop
From dialogue to stage direction, students explore writing techniques for effective scene and playwriting. Students study inspiring scenes from movies or plays and then write and revise their own pieces for film or stage.

Week 5 (July 20–24)
Stories in Many Forms
Books are just one component of an exciting journey into writing, reading, and telling stories. There are many ways to present words and ideas. From creating an original hardcover book to publishing a news article on the Internet, students write and communicate using a variety of media.

(PreK/K) Cover to Cover: Make Your Own Book
Have you ever wanted to see your name on the cover of a book? Here’s your chance to create your own illustrated story and learn how to bind it between two covers. Young authors publish their own original stories.

(K/1) Click! Telling Stories with Photos
Photographs are both inspiration and illustration as students combine words and images in the creation of original stories and poems. Students take their own photos as well as collect photos from families, magazines and other sources.

(1/2) Comic Book Characters
What do Babymouse, Spiderman, and Charlie Brown have in common? They are all characters in stories found in comic books, comic strips and graphic novels. Students will create original works on paper using a combination of creative writing and drawing.

(2/3) News Feed: Lead & Follow
New media skills include the use of digital writing tools and the ability to share information in the fast-paced world of online news. Aspiring new media journalists conduct research, think critically about reliable sources, and separate fact from opinion. Students write exciting online news stories, incorporating key nonfiction writing skills.

“I’m going to miss that class!”
—2014 Leapfrog student
Mathematics Courses

Students with an identified strength in math may enroll in a Mathematics course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

Week 3 (July 6–10)

Geometry at Play

Geometry is all around us! Our world is composed of a fascinating variety of shapes, planes, lines, angles and symbols. With a focus on everyday applications of geometry concepts, young mathematicians play games, draw and construct models that explore both plane (flat) geometry and solid (dimensional) geometry.

(PreK/K) Playground Math

How many rectangles can be found in a set of monkey bars? How do you measure the angle of a slide? Will a bigger or smaller angle help you go down faster? Students are introduced to a variety of tools and geometric concepts for hands-on exploration of everyone’s favorite play space: the playground!

(K/1) Blocks & Blueprints

A blueprint is a drawing that shows the design of a building or an outdoor area. Using blocks and other construction materials, students create models of buildings and spaces. Then they apply geometry concepts and skills such as measuring perimeter, area and angles to draft blueprints and scaled diagrams of their creations.

(1/2) Treasure Maps

Making maps, or cartography, is a process that involves many different geometry skills. Adding the mystery of buried treasure makes understanding map scale, the compass rose and celestial navigation even more fun...and rewarding. Students apply geometry to create their own treasure maps and use classmates’ maps to find their treasure!

(2/3) Geodesic Domes & More

Have you ever seen a building shaped like a dome, such as Disney’s Epcot Center? Would you believe it’s actually made out of triangles? Geodesic domes, like Epcot’s Center’s Spaceship Earth, are spectacular applications of geometry. Students investigate the characteristics and uses of domes, spheres and other 3D objects, then create their own models of structures using a variety of construction methods.

Week 4 (July 13–17)

Math All Around Us

“Go down deep enough into anything and you will find mathematics.” —Dean Schlicter, math author

Inside the house and out on fields of play, counting and problem solving are important in our lives. Using everyday activities and events as inspiration, young mathematicians measure, graph, identify patterns and compare rates of speed to develop and hone their problem-solving, spatial-reasoning and critical-thinking skills.

(PreK/K) Math for Breakfast

Math is on the menu as students apply mathematical skills and concepts to the work of cooks and bakers. This course nourishes young minds with a well-balanced mathematical meal of measuring, timing, comparing and computing.

(K/1) Math Rain or Shine

Can the wind blow faster than a car on the highway? How much cooler is a spot in the shade than one in the sun? Students make predictions, collect and graph data and plow through computational problems about weather. The concepts of estimation, data collection, classification and patterns are introduced as students inquire and problem solve.

(1/2) Math in the Animal World

Could a sprinting cheetah beat a speeding porpoise in a race? How far do geese migrate each year? Animals do amazing things and learning about their fantastic feats is a great way to practice data comparisons, single-digit multiplication and algebraic equations. Young mathematicians use numbers to tackle story problems, carry out simple experiments and describe behavior in the fascinating world of animals.

(2/3) Math for Sports

How high do you have to jump to dunk a basketball? How fast can a batter make it to first base? Math is much more than keeping score. Student mathletes dive into problem solving to see how math is important in improving performance and understanding trends in their favorite sports. Students use critical thinking skills as they collect and interpret data; concepts include velocity, angles, rate and ratio.

Week 5 (July 20–24)

Math by the Book

Which would you rather read—a math textbook or a beautifully illustrated picture book that represents math concepts in a creative and visual way? Students who love both math and stories will enjoy stretching their math muscles in the context of great literature. Hands-on projects extend learning and make math come alive!

(PreK/K) Money in Print

Students learn the value of “once upon a time” when they explore storybooks that feature some form of money. Through hands-on activities with real and play money, students recreate and expand upon the calculations and transactions they find in storybooks. Like the main character in Alexander Who Used to be Rich Last Sunday, students may feel like they can’t get enough!

(K/1) Freaky Fractions

Get the whole story about the freaky fun of fractions. This course is one-third storybook inspiration, one-third hands-on exploration and one-third math calculations. Students study picture books and use the stories and illustrations to help them to make, compare, add and simplify fractions.

(1/2) Fibonacci & Friends

The children’s book The Rabbit Problem revisits Fibonacci’s famous story problem illustrating nature’s most fascinating number phenomena, the Fibonacci sequence. Through more stories and their own investigations, students learn how multiplication and division have created so many amazing images in nature.

(2/3) Zero the Hero

Zero has many superpowers, including the ability to become invisible in addition and subtraction problems. But zero can really flex its muscles in the big numbers that lead us to infinity and beyond. Books introduce students to zero’s history and power in imaginative and playful ways in this course about math’s unsung hero, zero.
Science Courses

Students with strong math or verbal ability may enroll in a Science course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

Week 3 (July 6–10)
Outdoor Expeditions
Students become keen observers of the living world just outside the classroom door. Through research, observations and hands-on experiments, students work outside during part of each class session to engage in scientific processes. Authentic science tools are used to strengthen research skills and learn about the amazing plants and creatures that live within our reach.

(PreK/K) My Magnifying Glass
Young naturalists use observation skills to describe the weather, identify plants and draw pictures of animal life. Students collect research and observations then represent what they’ve learned using both words and images.

(K/1) Grab Your Binoculars
Students conduct research about local insects and animals. Projects include building bird feeders and observing the skies to see which types of birds and insects live in the local environment. Using their own observations and information from research, students create a project about birds and insects.

(1/2) Digital Field Guide
In this course, students use a variety of tools such as sketch pads and digital cameras to observe plant life and track animal life outdoors in suburban or urban habitats. Aspiring naturalists conduct investigations, capturing images and information they can use to create a digital field guide.

(2/3) Under the Microscope
Using microscopes and other scientific tools, students explore tiny worlds outdoors. Imagine the fascinating details to be discovered when ants, worms, plants, soil and water are examined in sharp focus. Students gather and examine samples under a microscope, and sketch what they find. Using natural materials, they can then build a diorama view of the tiny world they’ve discovered.

Week 4 (July 13–17)
Mad Science & Great Discoveries
Roll up your sleeves, put on your gloves and goggles, and get ready to answer some perplexing questions. Students test out how everyday materials and products work as they learn the foundations of the scientific process. Basic laboratory techniques are introduced and critical-thinking skills are strengthened as students play with a variety of materials that demonstrate concepts in biology, chemistry and physics.

(PreK/K) Spin & Swing: Physics in Motion
What do a grandfather clock and a playground have in common? They both use the swinging motion of a pendulum. Young scientists investigate the forces and energy at play in the motion of swinging and spinning, such as the power of centrifugal force.

(K/1) Fast & Faster: Things that Go
Do you have the need for speed? Engineers use physics and technology to design machines that go incredibly fast. In this active course, students put their pedal to the metal, learning the science behind what propels cars, planes and other machines to move at extraordinary speeds. Through collaborative project work, including building and other hands-on activities, students learn basic physics principles around motion and velocity.

(1/2) Listen Up! Audio Experiments
Why does a “telephone” made from two plastic cups and a piece of string carry sound? Why does loud music make our windows rattle? Let’s make some noise and find out. Through hands-on activities, students in this course investigate how sound is made and how it travels as they are introduced to the surprising science of sound.

(2/3) Rocket Science: Blast Off with Newton
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 conducting experiments. In small, collaborative groups students will apply what they learn by building and launching their own simple rockets.

Week 5 (July 20–24)
Creatures Featured
These aren’t your everyday animals! From examining ferocious felines in the wild to unlocking the mysteries of underwater conversation, living things are fascinating. What are the characteristics of these “strange” animals? Can they engage in casual conversation? Can they help us stay healthy? Through readings, discussion and hands-on experiments, students strengthen their scientific research skills and learn about these amazing creatures, the way they live and how they keep adapting to their ever-changing environments.

(PreK/K) Big Cats: Lions, Tigers & More
As novice zoologists, students explore the captivating world of big cats from lions to jaguars to unique cat hybrids. Students “travel” across the globe in order to observe and discuss how these astounding animals interact with their habitat and each other. Through research and hands-on activities, students are introduced to the incredible world of these marvelous mammals and gain an appreciation of wildlife conservation.

(K/1) Whale Talk: How Sea Creatures Communicate
Can a whale tell a joke or sing a lullaby? Whales make amazing sounds to communicate with each other. In this course, mini marine biologists learn how these intelligent creatures of the deep use echolocation, clicks, whistles and music-like tones to communicate with each other and, perhaps, with us. Hands-on activities and projects introduce students to the ways these marvelous mammals use sound to connect and make sense of their world.

(1/2) Dinosaur Discovery: Paleontology Unearthed
Dinosaurs may have roamed the earth millions of years ago but they are just as fascinating as ever! Aspiring paleontologists learn about the many species of these “terrible lizards” from the famous T-Rex to the only recently identified Linheraptor. Students unravel the mysteries of how these animals lived, looked and died as they literally and figuratively “dig” deep into the fossil record. Join our expedition!

(2/3) Birds of Prey: Hunters in the Sky
With great speed and sharp talons, birds of prey stalk both land and sky. There are approximately ten thousand species of birds in the world, each distinctive in its survival methods. What makes birds of prey unique? Young ornithologists engage in research and hands-on activities to investigate winged hunters such as owls, eagles, hawks and herons.
All-day Courses: Leapfrog & Spark, Grades 2–4

NEW! Spark courses are now available for students in grades 3 & 4!

All-day Leapfrog & Spark are weeklong programs that introduce students to a topic of interest and foster critical and creative thinking through interactive, project-based activities. Leapfrog courses are for students in grades 2 and 3. Spark courses are for students in grades 3 and 4. Students take a single course that meets approximately five-and-a-half hours a day, allowing for focused study. Courses meet from 9:15 a.m. to 3:45 p.m., Monday through Friday (except in Elmhurst, where courses meet from 8:30 a.m. to 2:45 p.m.).

All-day Course Reference Chart

Select course topics that best fit your child's academic strengths as determined through test scores and/or other academic measures.

<table>
<thead>
<tr>
<th>SITE</th>
<th>WEEK 1</th>
<th>WEEK 2</th>
<th>WEEK 3</th>
<th>WEEK 4</th>
<th>WEEK 5</th>
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<tr>
<td></td>
<td>Tech Power Animation (2/3)</td>
<td>LEGO® Metropolis (2/3)</td>
<td>Rule Your World (2/3)</td>
<td>Design Your World (3/4)</td>
<td></td>
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<tr>
<td></td>
<td>Treehouse Architecture (2/3)</td>
<td>Flight School (2/3)</td>
<td>Animal Heroes (2/3)</td>
<td>Tech Power Animation (2/3)</td>
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<td>Skokie</td>
<td>Invention Convention (3/4)</td>
<td>Tech Power Animation (2/3)</td>
<td>How Things Work (3/4)</td>
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<td>Pen to Podium (3/4)</td>
<td>Treehouse Architecture (2/3)</td>
<td>Pen to Podium (3/4)</td>
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<tr>
<td></td>
<td>Digital Game Design (2/3)</td>
<td>Flight School (2/3)</td>
<td>Girl Power Animation (2/3)</td>
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<td>Rule Your World (2/3)</td>
<td>Digital Game Design (2/3)</td>
<td>WeDo Plus (2/3)</td>
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<tr>
<td>Lake Forest</td>
<td>Pen to Podium (3/4)</td>
<td>Wilderness Challenge (2/3)</td>
<td>Survivor Math (3/4)</td>
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<td>Flight School (2/3)</td>
<td>Flight School (2/3)</td>
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</tr>
</tbody>
</table>
Leapfrog & Spark
All-day Course Descriptions

English & Language Arts

Students with strong verbal ability may enroll in an English & Language Arts course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

(2/3) Story Power Animation

Make your stories come alive with animation! Students write and edit original narratives and record their work as audio tracks. These recordings are then used to create animated shorts based on hand-drawn, collage or computer-generated illustrations.

NOTE: Additional $25 materials fee is required.

(3/4) Pen to Podium: Expert Writing & Speaking

For a school essay on the importance of the Bill of Rights and the latest pitch to your parents to get you a dog, would you use the same approach? Is a well-written essay always an effective oral argument? Essays and speeches must be crafted strategically to have the greatest impact. Pen to Podium students explore rhetorical devices and other techniques for constructing strong written pieces and delivering excellent speeches, including selecting language for its appeal to the ear, heart and mind.

Mathematics

Students with strong mathematical ability may enroll in a Mathematics course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

(3/4) Survivor Math

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 disabled space station, cornered by an enemy army or stranded in a deadly snowstorm. Geometry, algebraic thinking, probability and measurement are just a few of the mathemetic concepts used to save the day.

Science

Students with strong math or verbal ability may enroll in a Science course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

(2/3) Animal Heroes: The Science Behind Rescue & Service Animals

Rescue and service animals are no ordinary pets. Trained and talented, these animals, primarily dogs, are able to sniff out people trapped under collapsed buildings, assist and guide people with disabilities, and provide comfort and companionship to people with illnesses. Students study animal behavior and biology concepts that influence the selection, training and daily lives of rescue and service animals.

NEW! (2/3) Flight School: An Introduction to Aeronautics

Eager to earn your pilot’s license? Learn the fundamentals of flight and set your course for the skies. Students research the physics of flight, the mechanics of airplanes, the basics of navigation and the essentials of meteorology, then practice what they’ve learned using flight simulation software and remote control airplanes.

NEW! (2/3) Wilderness Challenge: Math & Science Outdoors

Outdoor challenges require determination, self-reliance and knowledge of math and science concepts. Students learn about outdoor resources for food, water and shelter. They create solar ovens to cook food and learn methods for purifying water. In addition, students build a shelter using basic, sometimes found, materials. This hands-on course combines classroom time and outdoor learning. Please wear clothes that can get dirty.

Design & Engineering

Students with strong math or verbal ability may enroll in a Design & Engineering course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

(2/3) LEGO® Metropolis: Urban Design & Architecture

A treehouse can be as simple as a few boards of wood wedged between branches or as elaborate as a palace in the sky. Students imagine and design their dream treehouses, incorporating concepts from architecture, engineering and botany. Constructing scale models of treehouses from a variety of materials will be a primary course activity.

(2/3) Rule Your World: Playing & Analyzing Strategy Games

Games like Ticket to Ride, Settlers of Catan and 7 Wonders develop skills such as making predictions, calculating odds, developing alliances and creating contingency plans. Students play games, discuss and learn strategies and evaluate outcomes.

NEW! (2/3) WeDo Plus! Building, Programming & Modifying Robots

The LEGO® WeDo robotics system engages students in technology experiments that explore science, mathematics, social studies and language concepts. Using icon-based programming software, students write and download programs to LEGO® robots allowing them to manipulate the movements of their models. This course is similar to the CTD SEP course WeDo Robotics. There are no prerequisites.

NOTE: Additional $25 lab fee is required.

NEW! (3/4) Design Your World: Invent & Test Complex Board Games

When playing Euro-style board games, players visit exciting imaginary or historic settings and navigate through rule-based scenarios. Designing a great board game requires creativity as well as logic, analysis and innovation. Designers must think about what makes a game appealing and keeps it engaging. Students learn 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.

(3/4) Robotics Lab: Recording & Sharing EV3 Experiments
Building and programming robots using LEGO® EV3 robotics kits develop engineering and computer science knowledge and skills. Recording and documenting robotics projects, with both words and images, develop introductory scientific research skills. This course is the whole package—hands-on experience with technology and preparation for scientific research and traditional lab experiments. There are no prerequisites for this course.

NOTE: Additional $25 lab fee is required.

NEW! (3/4) Girl Power Robotics Lab: Recording & Sharing EV3 Experiments
This is the same course as Robotics Lab, but taught but in a girls-only learning environment. The girls-only format is designed to help develop girls’ leadership skills and encourage achievement in science and technology. There are no prerequisites for this course.

NOTE: Additional $25 lab fee is required.

(3/4) How Things Work: Electronics
How does a television work? What’s inside your computer or cell phone? We love working and playing with high-tech gadgets, but how often do we stop to think about how these tools actually function? In this inquiry-based course, students safely dismantle consumer electronics to discover how they work. Students also examine the development and use of these items and how they might be improved in the future. Through research, experimentation and discussion, students create and build simple electronic machines and circuits.

NOTE: Additional $25 materials fee is required.

(3/4) Invention Convention: Ingenious Engineering
Humans continually invent new ways to make their lives easier, safer and more interesting. We create new and improved toys and games. We figure out more efficient ways to transport our stuff and ourselves. Students channel their creative instincts by brainstorming, designing and constructing inventions that really work. The work begins with the study of great inventors and how and why certain products or machines were invented. After brainstorming ideas, students develop their own invention, plan how to make it, and then create and test their product.

NOTE: Additional $25 materials fee is required.

Computer Science & Technology
Students with strong math or verbal ability may enroll in a Computer Science & Engineering course. Identify the appropriate section for your child based on his/her grade level on January 1, 2015. See course charts for course availability per site and week.

(2/3) Tech Power Animation: Scratch & More
Animation is all around us: in movies, on the Internet, even on our phones. In this hands-on course students learn fundamental computer animation using Scratch, a programming language designed to help young people produce rich interactive media. Skill development includes basic drawing tools as well as simple animations, graphic morphing and graphic layering. Students create a brief animation program to share at the Expo! After completing this course, students are prepared for more advanced animation and program design work.

NOTE: Additional $25 lab fee is required.

NEW! (3/4) Photoshop Workshop: A Digital Studio
What is a pixel? How do artists create unique, digital images on the computer? Delve deep into Photoshop to discover what truly makes a digital image and see why it has been a leading graphics application for 25 years. Students master the program’s tools to express themselves creatively and narratively.

NOTE: Additional $25 lab fee is required.

NEW! (3/4) Girl Power: Web Design
Learn about exciting, current technology topics in this girl-positive environment! Using hands-on, project-based approaches, students are introduced to web design tools and Photoshop. Students delve into the design process through introductions to fun and powerful software, which may also include Flash, Adobe Dreamweaver and Notepad++.

NOTE: Additional $25 lab fee is required.
Leapfrog & Spark Details, Fees & Application Procedure

Early Application Deadline is April 15, 2015.
Regular fees apply after the early application deadline.

Application Period
The application period begins January 15, 2015 and applications are reviewed as they are received.

Application Review Process
Courses are filled on a first-come, first-served basis. All applicants are encouraged to apply early, as classes typically begin to fill and close as early as mid-March. Please be sure your application includes all required materials. Applications are reviewed only after they are complete.

Once the CTD Summer Program office receives a completed application, it is forwarded to the appropriate program coordinator for review. Once an enrollment decision is made, the program coordinator will notify the applicant via e-mail. The process takes approximately four weeks from the time that a completed application is received in the office. Due to the volume of applications, the review process may take longer for applications submitted closer to the start of the program.

NOTES:
• Applicants submit an application online at www.ctd.northwestern.edu/summer. If you are unable to apply online you may request that a paper application be sent to you by contacting the Summer Program office.
• If you have questions, please e-mail Summer Program staff directly: summer@ctd.northwestern.edu.

Course Availability
Complete applications are reviewed in the order received. A course listed as available on the website at the time an application is submitted may be filled before that application is processed, due to the queue of applications awaiting processing.

Eligibility
Leapfrog and Spark provide enrichment courses specifically designed for students age 4 (PreK) through grade 4 who demonstrate exceptional ability and a strong interest in learning. Students should apply for courses that are in their subject area of greatest strength and interest. The focus of the program is on advancing higher-order and creative-thinking skills in students’ talent areas. Courses are fast-paced and the curriculum is designed for students who function at least one or two grade levels above their chronological grade placement. Families should select a course grade band based on the student’s age and grade level on January 1, 2015.

Admission criteria vary by subject area and grade completed, as detailed below.

• FOR ENGLISH & LANGUAGE ARTS COURSES: Students must have a verbal or reading score in the 90th percentile or above on an in-grade, nationally normed standardized achievement test.
• FOR MATH COURSES: Students must have a quantitative or mathematics score in the 90th percentile or above on an in-grade, nationally normed standardized achievement test.
• FOR SCIENCE, ENGINEERING OR TECHNOLOGY COURSES: Students may qualify with a quantitative/math or verbal/reading score in the 90th percentile or above.
• NOTE: If your child’s test score report does not include a National Percentile Rank (NPR), ask your school administrator whether or not the information is available. For example, the Illinois Standards Achievement Test (ISAT), no longer lists NPR on test reports for parents, but the information is provided to school districts and may be requested.

Students who participate in Northwestern University’s Midwest Academic Talent Search (NUMATS) in grade 3 or 4 may submit EXPLORE® test scores to qualify for Leapfrog or Spark courses. Since EXPLORE® is an above-grade-level test, students do not need to score in the 90th percentile on the EXPLORE® subtests to qualify, though program staff reserves the right to request additional information to make an admission decision.

Because many students age 4 through grade 4 do not have the opportunity for achievement testing within their schools, Center for Talent Development has a testing program (see next section). Comparable evaluations by a school psychologist may be used to demonstrate eligibility for the Leapfrog or Spark program only if achievement scores in the areas of mathematics and language arts are included in the test report in the form of nationally normed percentiles.

Students in grades 2, 3 or 4 who do not have test scores may choose to submit an Admission Portfolio (see page 18).

“Getting the Leapfrog summer course catalog each year is so exciting. My child always finds the perfect class...or two, or three!”

—2014 Leapfrog parent
Testing for Leapfrog Admission Through CTD
CTD has developed a testing program for students between the ages of four and nine (or not yet in grade 4). The CTD evaluation consists of achievement tests in letter recognition and reading, early mathematics, general information, and abstract representation. Please refer to www.ctd.northwestern.edu/summer for additional information and current fees.

To arrange for testing, contact CTD at 847/491-3782 extension 6. Call for testing appointments early as it may be several weeks between when an appointment is requested and the scheduled testing date, due to testers’ availability and the volume of requests. We will do our best to accommodate late tests, but enrollment, particularly in first course choices, may not be possible.

Lunch & Recess Option
Students enrolled in both a morning and afternoon course or in an all-day Leapfrog or Spark course are automatically enrolled in lunch/recess at no extra charge. Students are supervised by teaching assistants as they eat lunch and participate in games and recreational activities. Parents must provide a bag lunch that does not require refrigeration or heating.

All-day students in Elmhurst do not need to bring a bag lunch. They will be provided lunch in the Elmhurst College dining hall at no extra charge.

Leapfrog & Spark Course Fees
In 2015, applications submitted on or before April 15, 2015 will be charged the Early Application rate. Applications submitted after April 15, 2015 will be charged the Regular Application rate.

NOTES:

<table>
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<tr>
<th>HALF-DAY COURSES</th>
<th>EARLY APPLICATION TUITION RATE (SUBMITTED BY APRIL 15, 2015)</th>
<th>REGULAR TUITION RATE (AFTER APRIL 15, 2015)</th>
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<td>Tuition per half-day Leapfrog course</td>
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<th>ALL-DAY COURSES</th>
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</thead>
<tbody>
<tr>
<td>Tuition per all-day Leapfrog course</td>
<td>$650</td>
<td>$700</td>
</tr>
</tbody>
</table>

• Students who withdraw after the start of a course receive no refund.
• Students dismissed for disciplinary reasons are not eligible for any refund.
• The $60 withdrawal processing fee is not waived except in the following cases: all of the student’s course choices are closed or canceled or financial aid is not adequate for participation.
• Refund processing may take eight weeks.

Financial Aid
• CTD offers need-based financial aid, which is awarded on a rolling basis as requests are received beginning in January 2015. Families are encouraged to apply early, as the amount of aid available is limited and is typically exhausted quickly. The financial aid application deadline is April 15, 2015.
• The aid awards vary from partial to full tuition support. Awards are based on family income and extenuating circumstances (e.g., loss of job, unforeseen medical expenses, etc.). Most families awarded aid have a total household income of less than $50,000.
• Financial aid will be awarded for a maximum of two half-day courses of Leapfrog or one all-day course of Leapfrog or Spark per student.
• To be considered for financial aid, families must complete the Financial Aid Application. All required materials (tax information, statement of need, etc.) must be included in the financial aid submission in order for a financial aid application to be considered.
• The amount of financial aid granted and the balance due will be reflected on the invoice included in the acceptance materials. Any outstanding balance must be paid by June 8, 2015.

• Online application requires credit card payment. Contact the Summer Program if you are unable to pay via credit card.
• Unless applying for financial aid, Leapfrog applications must include payment for the total tuition.
• Fees include tuition and basic materials. A few courses require an additional lab or materials fee.

Refunds & Withdrawals
• All requests for tuition refunds and/or withdrawals must be made in writing and e-mailed, faxed or mailed to CTD.
• If a student withdraws in writing on or before June 8, 2015, CTD will refund the program fees paid, less a $60 withdrawal processing fee. If a student withdraws after June 8, 2015, but before the start of the course, CTD will refund 50% of the program fees paid, less a $60 withdrawal processing fee.
Evaluations
• Leapfrog and Spark courses are for enrichment; students do not receive grades for the course(s) they complete.
• All students are sent a narrative evaluation which includes comments on performance and recommendations for future study.
• Evaluations are sent to families via e-mail after the end of the summer program season, usually by late September.

Program Application Procedures
You may apply online at www.ctd.northwestern.edu/summer or request that an application for admission be sent to you. CTD does not accept faxed applications.

To begin the application process, select the applicant type best suited to you based on the following descriptions.

New Applicant or New Scores
The student must meet one of the following two criteria:
• The student has never attended a Center for Talent Development (CTD) program and has qualifying test scores (see Eligibility section for details).
• The student has previously attended a CTD program, but the student has new test scores qualifying the student in an additional content area.

Recent Participant
The student must meet both of the following criteria:
• The student has successfully completed a CTD course (within the last two years) and the student is applying for a course in the same subject area or one that requires the same qualifying test score.
• The student has test scores or an admission portfolio on file at CTD that meets the criteria for the course for which the student is applying.

Admission Portfolio Applicant
The student must meet both of the following criteria:
• The student is in grade 2 or higher (as of January 1, 2015).
• The student does not have qualifying test scores because the student has
1. Never taken a nationally normed standardized achievement test OR
2. Taken this type of test but not achieved a qualifying test score.

Visa & Passport Requirements for International Applicants (non-U.S. citizens)
Any admitted student who is not a U.S. citizen, U.S. permanent resident or in another visa category that allows for study, and is applying for more than one half-day course (over 18 hours of study), requires sponsorship for a student visa. Failure to comply may negatively impact a student’s ability to secure another non-immigrant visa in the future. See the Summer Program website for additional information on requirements.

Application Materials Checklist
Use the following chart to determine what materials are required.

<table>
<thead>
<tr>
<th>Applicant Type</th>
<th>Recent Participant</th>
<th>New Applicant or New Scores</th>
<th>Admission Portfolio Applicant</th>
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<tr>
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<td>Full Tuition</td>
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<td>Test Scores</td>
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<tr>
<td>Teacher Recommendation</td>
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</table>
APPLICATION NOTES:

• Test scores refer to nationally normed standardized achievement tests. For a list of example tests, visit our website at www.ctd.northwestern.edu/summer.

• If test scores submitted are more than two years old, CTD may request additional information or updated test scores.

• The report card should be the most recent evaluation of your child’s school performance.

• For portfolio applications, a recommendation from the student’s current classroom teacher is required. Families will find the link to the teacher recommendation form on the Summer Program website.

• All courses are taught in English. Students need a good command of written and spoken English to succeed in the courses.

The online application is available at www.ctd.northwestern.edu/summer. You will need a credit card to complete the transaction and submit the application. We recommend that you prepare all necessary supporting documents (test scores, teacher recommendation, etc.) for the application in advance.

Applicants will be e-mailed a confirmation that they have submitted the application. The parent e-mail provided in the online application is the address to which all CTD communications will be sent. Please note that applications are not complete nor are they reviewed by program coordinators until all supporting documentation is submitted.

If you are not able to apply online, request that a paper application be sent to you by e-mailing the Summer Program office at summer@ctd.northwestern.edu or calling 847/491-8257.

Be sure to provide us with the following information:

1. Which application form(s) you are requesting (i.e., Leapfrog)
2. How you would like the material sent: e-mail or postal service
3. Address and contact information: name, mailing address (including city, state and zip code) or e-mail address and, in both instances, a phone number in case we need to contact you.

Summer Program & CTD Communication
Phone: 847/491-8257 (Summer Program direct line)
E-mail: summer@ctd.northwestern.edu
Fax: 847/467-0880

When you register your child for a CTD course, you will receive notifications of other programs and services provided by CTD. If you do not wish to receive e-mail messages promoting programs or services from CTD contact us at 847/491-3782 ext. 4.

“Everything about the program is exceptional...100% awesome experience.”

—2014 Leapfrog parent
Spark, Solstice & Apogee

Grades 4, 5 or 6
(grade level on January 1, 2015)

There are multiple program offerings for students in grades 4 through 6 because of the varied academic, social and developmental needs of students in this broad age group. Select the appropriate program based on your child’s academic needs and social-emotional readiness, particularly when considering the Solstice or Apogee residential program option.

Please read the following information carefully; program options have changed for Spark, Solstice and Apogee in 2015.

Apply Early! Application Period Begins January 15

Spark
Spark is a weeklong enrichment program for students in grades 3 or 4 that introduces a topic of interest and fosters critical and creative thinking through interactive, project-based activities. Students in the Spark program take a single course that meets approximately five-and-a-half hours a day, allowing for focused study. The Spark Program culminates with an Expo! of student work.

New for 2015, Spark courses are available in multiple locations, including Elmhurst College and select Leapfrog sites; Spark is a commuter-only program and is for students in grades 3 or 4. Please see the Leapfrog & Spark All-Day Courses section (page 13) for locations, dates, courses available and program application details.

Solstice
Solstice is a two-week enrichment program for students in grades 4, 5 or 6 that provides deep exploration of an exciting and complex topic of study. Students problem solve and hone study skills as they complete course projects. Students in the Solstice program take a single course that meets approximately five-and-a-half hours a day, allowing for focus and depth. The Solstice program culminates with an Expo! of student work. Please check the details section (page 43) for additional information.

For 2015, Solstice has been expanded to three sessions on the Northwestern University Evanston campus. Two sessions of Solstice (commuter only) are available at Elmhurst College. A residential option is available at the Solstice program held on Northwestern University’s Evanston, Illinois campus. Taking courses while living on a college campus affords students ready for a residential program the opportunity to experience college in a safe and structured way.

Apogee
Apogee is a three-week, intensive program for students in grades 4, 5 or 6. Apogee courses introduce students to advanced concepts in a particular subject area, helping them to gain new knowledge and develop creative, problem-solving and study skills in a rigorous, supportive environment.

There are two different course types offered in Apogee:
- Enrichment Intensive (fast-paced, rigorous, non-credit courses designed to allow students to explore specialized subjects in depth)
- Credit Intensive (compacted high school honors courses designed to help students accelerate in a particular subject area). Credit Intensive courses include the compacted, full-year Algebra course and Computer Programming Honors: Java.

Apogee students take a single course that meets five and a half hours a day, allowing for focus and depth. The Apogee program culminates with an Expo! of student work and the opportunity to meet individually with course instructors. Please check the details section on page 43 for additional information.

A residential option is available at the Apogee program held on Northwestern University’s Evanston, Illinois campus. Taking courses while living on a college campus affords students ready for a residential program the opportunity to experience college in a safe and structured way.

“My favorite part was getting to know people from around the world… I made so many friends.”

—2014 Apogee student
### SOLSTICE: Grades 4–6, Two-Week Program at Elmhurst College, Elmhurst, IL
(commuter only)

**Session 1: June 22–July 3**

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>4</td>
<td>Mount Olympus to Asgard: Myth, Legend &amp; Percy Jackson</td>
</tr>
<tr>
<td>6</td>
<td>Topics in Pre-Algebra</td>
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<tr>
<td>8</td>
<td>Cool Chemical Capers</td>
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<tr>
<td>10</td>
<td>Breakout Biology: Infectious Disease</td>
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<td>14</td>
<td>Minecraft</td>
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**Session 2: July 6–17**

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<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>1</td>
<td>Novel Engineering</td>
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<tr>
<td>9</td>
<td>Introduction to Genetics</td>
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<tr>
<td>11</td>
<td>Android Applications &amp; Computer Programming</td>
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<tr>
<td>12</td>
<td>Phun Physics: Industrious Engineering</td>
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### SOLSTICE: Grades 4–6, Two-Week Program at Northwestern University, Evanston, IL
(residential or commuter)

**Session 1: June 28–July 10**

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<thead>
<tr>
<th>COURSE NUMBER</th>
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<tbody>
<tr>
<td>1</td>
<td>Novel Engineering</td>
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<tr>
<td>3</td>
<td>Get Smart! Spies, Gadgets &amp; Intelligence Organizations</td>
</tr>
<tr>
<td>6</td>
<td>Topics in Pre-Algebra</td>
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<td>8</td>
<td>Cool Chemical Capers</td>
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<td>11</td>
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<td>Minecraft</td>
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**Session 2: July 12–July 24**

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<tr>
<th>COURSE NUMBER</th>
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<tbody>
<tr>
<td>1</td>
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<td>12</td>
<td>Phun Physics: Industrious Engineering</td>
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<td>14</td>
<td>Minecraft</td>
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**Session 3: July 26–August 7**

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<tr>
<th>COURSE NUMBER</th>
<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>2</td>
<td>Sketch Comedy &amp; Improvisation</td>
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<tr>
<td>5</td>
<td>Money on the Brain</td>
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<tr>
<td>7</td>
<td>Math Madness!</td>
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<td>10</td>
<td>Breakout Biology: Infectious Disease</td>
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<td>13</td>
<td>Roller Coaster Physics</td>
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<td>11</td>
<td>Android Applications &amp; Computer Programming</td>
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<td>COURSE NUMBER</td>
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<tr>
<td>15</td>
<td>Creative Writing: Short Story</td>
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<td>17</td>
<td>The Writing Lab</td>
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<td>19</td>
<td>From Page to Stage: Writing, Directing &amp; Performing</td>
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<td>21</td>
<td>Power &amp; Influence: Practice in Persuasion</td>
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<tr>
<td>22</td>
<td>Start-Up Strategies: A Business Workshop</td>
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<tr>
<td>23</td>
<td>Math: Puzzles &amp; Games</td>
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<tr>
<td>25</td>
<td>Pre-Algebra (graded)</td>
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<tr>
<td>27</td>
<td>Algebra 1 Honors (offered in Spectrum)</td>
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<tr>
<td>29</td>
<td>Zoology</td>
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<tr>
<td>30</td>
<td>Up, Up &amp; Away: Aerodynamics Past, Present and Future</td>
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<tr>
<td>31</td>
<td>Detective Science: An Introduction to Forensics</td>
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<tr>
<td>32</td>
<td>Python Programming: From Games to Google</td>
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<tr>
<td>33</td>
<td>Computer Programming Honors: Java</td>
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<tr>
<td>35</td>
<td>Robotics: Some Assembly Required</td>
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<td>37</td>
<td>Designing Machines that Work: Engineering &amp; Physics</td>
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**Session 2: July 19–August 7**

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<thead>
<tr>
<th>COURSE NUMBER</th>
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<tbody>
<tr>
<td>16</td>
<td>Creative Writing: The Next Chapter</td>
</tr>
<tr>
<td>18</td>
<td>From Scene to Seen: An Introduction to Filmmaking</td>
</tr>
<tr>
<td>20</td>
<td>Order in the Courtroom: The Law through Fable &amp; Fairy Tale Trials</td>
</tr>
<tr>
<td>21</td>
<td>Power &amp; Influence: Practice in Persuasion</td>
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<tr>
<td>24</td>
<td>Applied Math &amp; Everyday Calculus</td>
</tr>
<tr>
<td>25</td>
<td>Pre-Algebra (graded)</td>
</tr>
<tr>
<td>26</td>
<td>Algebra 1 Honors</td>
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<tr>
<td>28</td>
<td>Chem Lab: It’s Elemental</td>
</tr>
<tr>
<td>29</td>
<td>Up, Up &amp; Away: Aerodynamics Past, Present and Future</td>
</tr>
<tr>
<td>31</td>
<td>Journey through the Cosmos: Space &amp; Astrophysics</td>
</tr>
<tr>
<td>32</td>
<td>Python Programming: From Games to Google</td>
</tr>
<tr>
<td>34</td>
<td>Web Design: Introduction to HTML &amp; CSS</td>
</tr>
<tr>
<td>35</td>
<td>Robotics: Some Assembly Required</td>
</tr>
<tr>
<td>36</td>
<td>ROVing Robotics: Exploring the Technology of Unmanned Vehicles</td>
</tr>
<tr>
<td>37</td>
<td>Designing Machines that Work: Engineering &amp; Physics</td>
</tr>
</tbody>
</table>

**APOGEE: Grades 4–6, Three-Week Program at Northwestern University, Evanston, IL (residential or commuter)**

Session 1: June 28–July 17

Session 2: July 19–August 7
In this course, students discover why myths were created by many of the world’s ancient civilizations and how those myths are found in contemporary literature, film and other media of today. How many of those stories were based on real experiences? Students explore the art of storytelling, discuss mythology and examine oral tradition as they experiment with creative performance and come to understand the mythologies of ancient times.

**OFFERED:** NU & EC

### 5. Money on the Brain: Behavioral Economics

"Economics is uncertain because its fundamental subject matter is not money but human action."—Julian Baggini

Getting something for free can cost you. And, having many options distracts you from making the best choice. While using various research strategies and designing experiments, students explore what happens when psychological influences (like emotions and persuasion) meet market forces. Using statistical analysis to interpret data, students examine the question “do our decisions about money make sense?”

**OFFERED:** NU

### 6. Topics in Pre-Algebra

This introduction to Pre-Algebra surveys traditional topics such as properties of rational numbers, algebraic equations, geometric figures, ratio, proportion, percent, exponents and radicals, inequalities, the coordinate plane, areas and volumes, probability and statistics. Students build arithmetic skills as they apply to the study of algebra. This course is designed specifically for advanced math students who want a preview of Pre-Algebra for future study.

**OFFERED:** NU & EC

### 7. Math Madness!

Caution: The problems in this course may drive you wild! But, armed with motivation, persistence and problem-solving skills, you’re bound to triumph. Using problems from the Art of Problem Solving and MATHCOUNTS, students learn concepts from pre-algebra, algebra and geometry and utilize a wide range of problem-solving tactics. Math Madness! activities engage students who love number problems and puzzles, and who seek greater challenges in mathematics.

**OFFERED:** NU

### Science

**ADMISSION CRITERIA:** EXPLORE® test; OR ≥ 90th national percentile rank on standardized achievement test (see course descriptions for qualifying subject area); OR Admission Portfolio

### 8. Cool Chemical Capers

How does soap remove dirt? What preserves packaged cupcakes? Students solve everyday mysteries in this inquiry-based introduction to chemistry. Through hands-on experiments in a laboratory setting, students investigate the properties of various elements and learn what causes or prevents chemical reactions. They also learn how substances can be classified by their properties, including melting temperature, density, hardness, and thermal and electrical conductivity.

**NOTE:** Additional $75 lab & materials fee required.

**QUALIFYING SCORE:** Math

**OFFERED:** NU & EC

### 9. Introduction to Genetics

When someone says, “it’s in the genes” what does it mean? Genes help determine the color of our eyes and hair, our height and our predisposition to certain illnesses. Students tackle genetics concepts and learn how genes and DNA determine traits through experiments and research. Course participants also discuss advances in the field of genetics, including the Human Genome Project, and consider the ethical, legal and medical issues involved.

**NOTES:**
- Additional $75 lab & materials fee required.
- At the Northwestern University location, this course will be using classroom and laboratory space at Roycemore School.

**QUALIFYING SCORE:** Verbal or Reading

**OFFERED:** NU & EC

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“My child loved learning in this course and was sad when it was over.”

—2014 Solstice parent
10. Breakout Biology: Infectious Disease
Infectious diseases have plagued and puzzled humanity from the beginning of time. From the common cold to Ebola, infectious diseases continue to roam our planet. Students learn about the fields of microbiology, immunology and epidemiology as they are introduced to the microbes that cause diseases, such as bacteria, viruses, parasites, fungi and prions. Students investigate how the human immune system works to keep us healthy and study advances in medical technology that have helped combat and eliminate diseases and allow us to find cures for others. Students learn to question and hypothesize, identify and manipulate variables, observe, measure and record data, and analyze and interpret results.

NOTES:
- Additional $75 lab & materials fee required.
- At the Northwestern University location, this course will be using classroom and laboratory space at Roycemore School.

QUALIFYING SCORE: Verbal or Reading
OFFERED: NU & EC

UPATED FAVORITE!
12. Phun Physics: Industrious Engineering
What design elements would you include to create the highest flying projectile launcher or the furthest rolling mousetrap car? Students explore that question and more in this hands-on introduction to physics and engineering. Through powerful 2D simulation software animations and individual and group projects, students explore physics concepts, such as force, acceleration, free-body diagrams, and potential and kinetic energy and investigate the mathematics behind them.

QUALIFYING SCORE: Math
NOTE: Additional $75 lab & materials fee required.
OFFERED: NU & EC

13. Roller Coaster Physics
Ever wonder how a single amusement park ride can make you feel lighter than air in one moment and pressed heavily down into your seat in the next, all while somehow keeping you safely inside the ride? Careening down a track at 60 miles per hour, sailing through clothoid loops and around hairpin turns may seem like a dangerous way to have fun, but the laws of physics used in roller coasters are only a simulation of danger. Strap yourself in for a fast paced adventure in the world of forces. Investigate topics such as the law of inertia, centripetal acceleration, centrifugal force, and g’s as you design and build a variety of amusement park thrills.

NOTE: Additional $75 lab & materials fee required.
QUALIFYING SCORE: Math
OFFERED: NU

Computer Science & Technology

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank in verbal or reading on standardized achievement test; OR Admission Portfolio

NEW! 11. Android Applications & Computer Programming
Calling all inventors! From graphing calculator functions to Instagram, mobile applications are used every minute of the day, all over the world. Students in this course learn key programming concepts and develop proficiency in drag and drop computer programming interfaces such as Scratch, Alice and Snap. Then, using the MIT App Inventor, students apply and extend their learning to build apps of their own. Bring your big ideas and problem-solving mentality, and prepare yourself to build!

NOTE: Students are encouraged to bring a personal Android device (such as a tablet or smart phone), but it is not required.

OFFERED: NU & EC

3. Get Smart! Spies, Gadgets & Intelligence Organizations
Human societies have developed intelligence networks to protect domestic secrets and protect themselves against threats. Cryptography and code breaking, remote sensing and surveillance are all a part of the intelligence game. Students explore the unique history, math and science behind intelligence gathering, researching spys and missions and developing their own plans, codes and gadgets to experience the world of espionage.

OFFERED: NU

14. Minecraft
Join classmates in a secure Minecraft world for unique design challenges. Build societies and systems, plan treasure hunts and enhance Minecraft skills. Use Minecraft to gain deeper knowledge of a wide variety of traditional academic content areas, including math (spatial reasoning, geometry), sociology (city planning, societal structures), and science (geology, circuitry). Previous experience with Minecraft is helpful, but not necessary.

NOTES:
- Students are required to bring a laptop computer for use in the course.
- Additional $75 materials fee required.

OFFERED: NU & EC

NEW! 17. The Writing Lab
Developing and writing a good essay is a lot like learning chess: it takes mental agility, practice and a willingness to learn from mistakes. In this workshop-based class, students learn to write various types of essays ranging from expository to persuasive. Through a variety of interactive class and small group activities, students learn to edit their work critically and incorporate feedback from peers and instructors into their writing. Drafting, revising and editing techniques help young writers produce a portfolio of polished compositions.

OFFERED: Session 1

NEW! 18. From Scene to Seen: An Introduction to Filmmaking
Casting Call: CTD seeks budding storytellers interested in all aspects of filmmaking process. No headshots required. Gain experience with pre-production techniques (storyboarding, planning shoots and screenwriting) through

OFFERED: Session 1

Apogee Course Descriptions

English & Language Arts

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank in verbal or reading on standardized achievement test; OR Admission Portfolio

15. Creative Writing: Short Story
“Short stories are tiny windows into other worlds and other minds and other dreams. They are journeys you can make to the far side of the universe and still be back in time for dinner.”—Neil Gaiman

In this writing workshop, students channel their creative ideas utilizing basic elements of a short story and intertwining the elements to form a polished, dynamic whole. By studying professional writing techniques, practicing writing and revising, and presenting their own work, young writers create an engaging portfolio to take home.

OFFERED: Session 1

16. Creative Writing: The Next Chapter
Young writers at any stage of book writing—from great idea to the final chapters—are encouraged to join this class where they study examples of successful and well-written novels and plot a course for writing their own pieces. Students identify the elements that make a great novel and apply them to their own process. Daily peer critiques and revision workshops are utilized to help developing writers tap into their creativity and practice the focus, discipline and diligence necessary to complete a novel.

OFFERED: Session 2

NEW! 17. The Writing Lab
Developing and writing a good essay is a lot like learning chess: it takes mental agility, practice and a willingness to learn from mistakes. In this workshop-based class, students learn to write various types of essays ranging from expository to persuasive. Through a variety of interactive class and small group activities, students learn to edit their work critically and incorporate feedback from peers and instructors into their writing. Drafting, revising and editing techniques help young writers produce a portfolio of polished compositions.

OFFERED: Session 1

NEW! 18. From Scene to Seen: An Introduction to Filmmaking
Casting Call: CTD seeks budding storytellers interested in all aspects of filmmaking process. No headshots required. Gain experience with pre-production techniques (storyboarding, planning shoots and screenwriting) through
post-production editing. This project-based course will have all students performing, directing, lighting and writing. Short films will be created on site. Required: creative mind, can-do attitude, team player.

**NOTE:** Students are required to bring a laptop computer for use in the course.

**OFFERED:** Session 2

19. From Page to Stage: Writing, Directing & Performing

Are you the next Julie Taymor, re-envisioning your favorite Disney story or Marvel comic book for the stage? Have you been crafting your own comedy or drama and want to see it come to life? Students in this collaborative course learn about various aspects of a theatrical production, from first inspiration to final bows. Through improvisation exercises, students develop confidence in their acting abilities and learn effective staging techniques. Daily critiques help dramatists improve their writing and performance skills, and produce a final, polished piece taken all the way from page to stage!

**OFFERED:** Session 1 & 2

**Social Sciences & Humanities**

**ADMISSION CRITERIA:** EXPLORE® test; OR ≥ 95th national percentile rank in verbal or reading on standardized achievement test; OR Admission Portfolio

20. Order in the Courtroom: The Law through Fable & Fairy Tale Trials

What do Jack and the Beanstalk, Hansel and Gretel and Little Red Riding Hood have in common? Each character is under 12 years old, gifted and capable of tackling extraordinary challenges in order to live “happily ever after.” Through the lenses of law and literature, students explore the moral dilemmas at the core of traditional tales. Is Jack guilty of manslaughter? Does Rumpelstiltskin deserve a pile of gold for breach of contract? An interdisciplinary mix of speaking and writing activities prepares students to take on the varied roles of lawyer, witness, juror and storyteller. Order in the Courtroom focuses on developing advanced skills in oral argument, moral reasoning, mediation, conflict resolution and the classic art of great storytelling.

**OFFERED:** Session 2

21. Power & Influence: Practice in Persuasion

Are you tired of wearing a uniform to school every day? Do you think you need the latest tablet or smartphone? Learn how to convince your parents or school principal to see things from your perspective. This introduction to persuasive speaking develops the skills needed to participate in debate, mock trial and forensic competitions. Students work on developing comfort with delivery as they perform pre-written essays, stories and speeches. They then learn to choose appropriate topics, form compelling introductions and locate convincing evidence to support their claims. Individual and group work will prepare budding debaters to explore their own persuasive voices.

**OFFERED:** Session 1

**Business & Entrepreneurship**

**ADMISSION CRITERIA:** EXPLORE® test; OR ≥ 95th national percentile rank in verbal or reading on standardized achievement test; OR Admission Portfolio

**NEW!** 22. Start Up Strategies: A Business Workshop

Are you the next Kickstarter success story? Do you dream of presenting and defending your unique product or service to the Shark Tank panel? Learn how to develop, test and market your ideas in this project-based class. Through workshops and simulations, students acquire an understanding of incentives, market behavior and scarcity, and learn how to identify determinants of supply and buyer demand. Readings and discussions build knowledge of fundamental economics concepts and entrepreneurship terminology.

**OFFERED:** Session 1

24. Applied Math & Everyday Calculus

Calculus students are notorious for asking, “When am I ever going to use this?” The answer is frequently, since calculus is the mathematical study of change! See advanced math concepts come to life using real-world applications and experiments that connect calculus to things we see in everyday life. Students discover concepts such as continuity, limits, derivatives and integrals and learn ideas fundamental to almost every scientific and technical field of study. Students in this course discover—and are able to explain—that they are, in fact, immersed in the world that calculus describes.

**OFFERED:** Session 1 & 2

25. Pre-Algebra Honors (Graded)

**PREREQUISITES:** EXPLORE® Math ≥ 17, OR ACT® M ≥ 22, OR SAT® M ≥ 520 or Admission Portfolio with test scores at the 99th national percentile rank in quantitative or math section on a standardized achievement test

Pre-Algebra covers a yearlong pre-algebra curriculum, including traditional topics such as properties of rational numbers, algebraic equations, geometric figures, ratio, proportion, percent, exponents and radicals, inequalities, the coordinate plane, areas and volumes, probability and statistics. This course builds upon the essential skills of arithmetic as they apply to algebra and is designed for accelerated math students who are looking to take Algebra I in the fall. Students completing Pre-Algebra are prepared for Algebra I.

**OFFERED:** Session 1 & 2
“I liked the challenging parts...I learned to overcome them and ask questions.”

—2014 Apogee student

26. Algebra I Honors (Graded)
PREREQUISITES: EXPLORE® Math ≥ 17, OR ACT® M ≥ 22, OR SAT® M ≥ 520 or Admission Portfolio with test scores at the 99th national percentile rank in quantitative or math section on a standardized achievement test
This course is intended for students who have already studied the introductory ideas of algebra and are ready to extend their knowledge in a full-year course. Algebra I Honors is an honors-level high school mathematics course covering equations and functions, properties of real numbers, solving and graphing linear equations and functions, solving and graphing linear inequalities, exponents and exponential functions, polynomials and factoring, quadratic equations and functions, radicals and geometry connections, and rational equations and functions. Students completing this course are prepared for Algebra II.

NOTES:
• This course may include both Apogee and Spectrum (grades 7 or 8) students.
• Students who earn a grade of C- or better and complete 12 chapters receive two semesters of high school credit through Center for Talent Development. Students who plan to use this course as a replacement for Algebra I in their regular school should communicate with school personnel prior to participating to determine if credit and placement might be acquired.

OFFERED: Session 2

NEW! 28. Chem Lab: It’s Elemental
You might already know what happens when you combine baking soda (a bicarbonate) and vinegar (an acetic acid), but have you ever seen a gummy bear dance with potassium chloride? Do you know why these reactions happen? In this course, students learn how chemistry explains—and impacts—the world around us and are introduced to core subjects including atomic weight and structure, acids and bases and chemical bonding. Working in a laboratory setting, students learn to design experiments, evaluate results and construct lab reports.

NOTE: Additional $125 lab & materials fee required.

QUALIFYING SCORE: Reading/Verbal
OFFERED: Session 1

NEW! 31. Journey through the Cosmos: Space & Astrophysics
Do you dream of being aboard Dr. Who’s TARDIS, probing the possibility of life on one of the newly discovered planets? In this stellar science class, students explore black holes, dark matter and dark energy, mysterious eruptions from the sun, gamma ray bursts, cannibalistic stars and galactic collisions. Astronomical scholars learn about the latest NASA missions and new technology used to gather data from the farthest corners of the universe. Students learn to apply the physics behind each topic and research the latest findings on phenomena beyond our solar system.

QUALIFYING SCORE: Reading/Verbal
OFFERED: Session 2

Science

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank (see course descriptions for qualifying subject area) on standardized achievement test; OR Admission Portfolio

UPDATED FAVORITE!
27. Zoology: Classification to Dissection
From a bat the size of a raspberry to a bird-eating vampire frog, new animal species are discovered nearly every day. How do scientists classify these new species? Participants in this laboratory-based course learn the basics of animal biology related to structure and physiology. Students investigate evolution-ary mechanisms that lead to the diversity of vertebrate and invertebrate animals. While conducting hands-on and virtual dissections and fieldwork, students identify, compare and contrast the critical features used to classify animals into major groups.

NOTE: Additional $125 lab & materials fee required.

QUALIFYING SCORE: Math
OFFERED: Session 2

29. Up, Up & Away: Aerodynamics Past, Present & Future
The world’s heaviest aircraft weighs in at 640 tons and was built to transport a space shuttle. How do the fundamental forces of flight (lift, drag, thrust and weight) work and how does such a giant machine get off the ground? In this project-based class, students apply the principles of aerodynamics to their own designs and constructions, including kites, hot air balloons, gliders and rockets. Through readings students learn about the historical development of flight, and through hands-on experiments they create hypotheses, observe flying machines in the air (including unmanned aerial vehicles, aka drones) and compose lab reports to understand the physics and engineering principles behind the science.

NOTE: Additional $125 materials fee required.

QUALIFYING SCORE: Math
OFFERED: Session 1 & 2

30. Detective Science: An Introduction to Forensics
“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.” This was a guiding philosophy of Sherlock Holmes and still is for the detectives of popular TV dramas. In this course, students learn the forensic science involved in solving crimes, including how to collect fingerprints, crack secret codes and examine corrosion evidence. Earth sciences, technology, life sciences, psychology, and physical sciences are combined to solve new mysteries every day. The course also includes studying and writing detective fiction.

NOTE: Additional $125 materials fee required.

QUALIFYING SCORE: Reading/Verbal
OFFERED: Session 1

37. Designing Machines that Work: Engineering & Physics
See course description in the Design & Engineering section on page 27.
Computer Science & Technology

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank in math on standardized achievement test; OR Admission Portfolio. For Computer Programming: Java, see course description.

NEW! 32. Python Programming: From Games to Google

Python is a powerful programming language that is used to drive the Google search engine, YouTube, and applications at NASA and the New York Stock Exchange. It has also been used to build many popular computer games. Because of its power, simplicity and complete object model, Python is an ideal language for learning the fundamentals of object-oriented programming, which prepares students for further Python development and can be applied to other object-oriented languages like Java and C++. Students learn to create Python scripts that use expressions, variables, conditionals, loops, lists, dictionaries, functions and objects. The course draws on a variety of resources, including video, interactive learning environments, and an online development environment that help students build their own computer games.

NOTES:
- Students are required to bring a laptop computer for use in the course.
- Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship. See page 46 for details.

OFFERED: Session 1 & 2

NEW! 33. Computer Programming Honors: Java (Graded)

PREREQUISITES: EXPLORE® Math ≥17, OR ACT® M ≥22, OR SAT® M ≥520 or Admission Portfolio with test scores at the 99th national percentile rank in quantitative or math section on a standardized achievement test. Pre-Algebra; demonstrated experience in one programming language.

In this rigorous course students learn computer programming using the Java programming language. As they create games, simulations and applications, students explore foundational programming concepts applicable to other object-oriented languages including Python, C++ and C#. Utilizing the Greenfoot programming environment, students employ sophisticated data structures and coding strategies to create games and agent-based simulations. Students also use the Netbeans programming environment to develop, review, document and publish several interactive math-oriented applications. This class prepares students to take more advanced programming courses, including AP® Computer Science A.

NOTES:
- Students are required to bring a laptop computer for use in the course.
- Students who earn a grade of C- or better receive 1 semester of high school credit through Center for Talent Development.
- Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship. See page 46 for details.

OFFERED: Session 1

UPDATED FAVORITE! 34. Web Design: Introduction to HTML & CSS

Using a hands-on, project-based approach, students learn the terminology, basic concepts and design techniques necessary for the development of a fully functional website. Students investigate design issues specific to web-based presentations, learn about effective page layout, navigation and text, and delve into the design process. Students are introduced to authoring software applications, such as Notepad++ and Adobe Dreamweaver, to create HyperText Markup Language (HTML) with Cascading Style Sheets (CSS) using the latest conventions as used by professionals in the web development industry. Photoshop, Flash and other available graphics software are used to create images and animation. JavaScript and jQuery may also be introduced.

NOTE: Additional $125 lab fee required.

OFFERED: Session 2

Design & Engineering

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank in math on standardized achievement test; OR Admission Portfolio

NEW! 35. Robotics: Some Assembly Required

Have you always wanted a robot to do your chores? Are you fascinated by smart technology? This course focuses on mechanical construction, characteristics of sensors, motors and gears, and control strategies for autonomous robots. Using LEGO® Minstorms EV3, students work in small groups to design, build and program robots that walk, talk, roll and think. Students learn basic principles of engineering, hone their math skills and test their creativity.

NOTE: Additional $125 materials fee is required.

OFFERED: Session 1 & 2

36. ROVing Robotics: Exploring the Technology of Unmanned Vehicles

Is there water on Mars? Yes! But, without the interactive capabilities of the rover, Curiosity, scientists would still be wondering if there was water on the “red planet.” How do unmanned aerial vehicles (UAVs), also known as drones, autonomous underwater vehicles (AUVs) and other remotely operated vehicles (ROVs) work? This course explores how ROVs function and the role they play in space exploration, disaster response, atmospheric readings and agricultural and wildlife surveys. Students program and manipulate quad-copters and other ROVs to discover their capabilities first-hand.

NOTE: Additional $125 materials fee is required.

OFFERED: Session 1 & 2

37. Designing Machines That Work: Engineering & Physics

In 1997, the Thrust SSC was the first land vehicle to ever break the sound barrier, reaching a speed of 763 miles per hour. France’s Millau Viaduct is a bridge that has a tower almost as tall as the Empire State Building. How did engineers create these marvels and what physics principles were utilized in designing them? In this hands-on course, students learn the fundamentals of physics as they investigate engineering concepts such as the conservation of energy and Newton’s laws of gravity and motion. Testing these theories, students generate creative solutions to practical problems faced in scientific and technological fields. Among other projects, students design and construct their own balsa wood bridges and CO2 dragster cars.

NOTE: Additional $125 materials fee required.

OFFERED: Session 1 & 2
Spectrum Program

Students in Grade 7 or 8*
(grade level on January 1, 2015)

Spectrum is a great opportunity for students in grade 7 or 8 on January 1, 2015 to study one subject in depth with peers who share similar interests and abilities.

There are two different course types offered:

- **Enrichment Intensive** (fast-paced, rigorous, non-credit courses designed to allow students to explore specialized subjects in depth)
- **Credit Intensive** (credit-bearing, compacted high school honors courses designed to help students accelerate in a particular subject area)

**Apply Early! Application Period Begins January 15**
* Students who are in grade 9 on January 1, 2015 may apply for Spectrum courses. Applications will be considered on a case-by-case basis.

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Spectrum is offered at Northwestern University’s Evanston, Illinois campus (residential or commuter).

Taking courses on a college campus affords students the opportunity to experience college in a safe and structured way.

Students take a single course that meets approximately five-and-a-half hours a day, allowing for focus and depth. Recreational activities are available to all students at the end of the academic day from 3 p.m. to 5 p.m. Please check the details section on page 43 for additional information.

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“Our son absolutely loved the challenge and the subject matter. He has grown mentally and as a citizen of the world.”

—2014 Spectrum parent
SPECTRUM ENRICHMENT INTENSIVE COURSES: Grades 7 & 8 at Northwestern University, Evanston, IL (residential or commuter)

Session 1: June 28–July 17

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Session 2: July 19–August 7

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SPECTRUM CREDIT INTENSIVE COURSES: Grades 7 & 8 at Northwestern University, Evanston, IL (residential or commuter)

Session 1: June 28–July 17

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Session 2: July 19–August 7

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<td>68</td>
<td>Visual Communication through Graphic Design</td>
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Enrichment Intensive Course Descriptions

Though not offered for credit, enrichment intensive courses are rigorous, fast-paced and cover high school level content. They are designed to engage students in a specialized, often interdisciplinary topic of interest and to allow in-depth study while applying critical and creative-thinking skills.

NEW! 38. An Epicure for the Common Kitchen
Food is life: it provides nutrition, reflects our culture, and is a global economic engine. As the nations trend toward eating farm-to-table, sourcing locally, and healthier home cooked meals, students in this course explore connections between what we eat and who we are while mastering kitchen basics and building the skills necessary to go from home cook to executive chef. Students learn by example and practice, getting guidance from professionals and guest culinary experts. Students research, experience and explore popular regional and ethnic fare and discuss how culture is influenced by food production, preparation, and consumption. Participants also get a glimpse of what it takes to enter and thrive in the culinary world. The class will include hands-on cooking, films/videos, and field trips to notable local culinary sites.

NOTES:
• Partnership course—please see course fee chart for details.
• This course takes place at a professional kitchen space in Evanston, IL. Residential students will travel to this nearby location by bus each day.

SUBJECTS: Social Science & Humanities, Science
OFFERED: Session 1
ADMISSION CRITERIA: EXPLORE R ≥ 14, SAT Crit. R ≥ 440; ACT R ≥ 19; or Admission Portfolio

40. Forensic Science
The word “forensic” comes from the Latin word meaning “before the forum.” Forensic Science examines the application of science to the criminal justice system. Utilizing mini-lectures, in class discussion and laboratory-related activities, students collect, preserve, and analyze crime scene evidence. The hands-on experiences provide the perfect venue for learning scientific methods, procedures and techniques. Labs may include trace analysis of hair, fiber, stain, epithelial cells, fingerprints and DNA. This class is an excellent prelude to future science and laboratory coursework.

NOTE: Additional $125 lab fee required.

SUBJECT: Science
OFFERED: Session 1
ADMISSION CRITERIA: EXPLORE R ≥ 14, SAT Crit. R ≥ 440; ACT R ≥ 19; ACT S ≥ 19; or Admission Portfolio

41. Competition Math
Do you participate in MATHCOUNTS® or have an interest in competition-based problem solving? Even if you have not joined a math team yet, this course will introduce you to the concepts and techniques of applied math and solving competition math problems. Examples of these are seen in AMC, the Art of Problem Solving and other national math contests. This course covers the major areas of competition math—algebra, geometry, number theory, counting and probability—and is ideal for students who enjoy math and solving challenging problems.

SUBJECT: Mathematics
OFFERED: Session 2
ADMISSION CRITERIA: EXPLORE M ≥ 15, SAT M ≥ 460; ACT M ≥ 18; or Admission Portfolio

42. Taking Action: Leadership & Service
Each year, more than three million Americans experience homelessness, 15 million go hungry and one in five children lives in poverty. Why does this happen? What can young people do about it? An offering of CTD’s Civic Education Project, this innovative curriculum integrates academic study with meaningful community service for an experience that participants describe as “eye-opening” and “life-changing.” Students divide their time between the classroom and supervised hands-on service projects with community organizations ranging from homeless shelters to Head Start programs to top political offices. Through academic research, small group work and facilitated reflection, students investigate the root causes and proposed solutions of pressing social problems. Young student leaders gain a deeper understanding of complex social issues and learn how to make a difference in communities. This course enhances communication, critical thinking and problem-solving abilities and prepares students for a lifetime of leadership and civic engagement.

NOTE: Additional $125 field study fee required

SUBJECT: Leadership & Service
OFFERED: Sessions 1 & 2
ADMISSION CRITERIA: EXPLORE R ≥ 14, SAT Crit. R ≥ 440; ACT R ≥ 19; or Admission Portfolio

Credit Intensive Course Descriptions

Credit Intensive courses are rigorous, fast-paced courses taught at the honors level. Students earn grades and are expected to complete a semester or year’s worth of curriculum in three weeks. Each 3-week course carries one or two semesters of high school credit offered through Center for Talent Development (CTD).

English & Language Arts

ADMISSION CRITERIA: EXPLORE R ≥ 16, SAT Crit. R ≥ 510; ACT R ≥ 22; or Admission Portfolio

NOTE: For all English & Language Arts courses, residential students are highly encouraged to bring a small personal printer.

43. Introduction to Creative Writing Honors
PREREQUISITE: Graded creative writing assignment.

Students learn to read, write and think like writers through the study of different creative genres that may include fiction, poetry and short story. Topics and inspiration are gathered from a variety of sources and activities such as writing prompts, open discussions and field trips. Students learn and apply the elements of effective writing through focused writing
exercises, peer group response, literary analysis and instruction in craft. Class participants develop a number of creative pieces for a portfolio reflecting their growth as both writers and thinkers. This course allows students to become more astute readers of literature and to understand more clearly how a writer employs aspects of craft to their creative advantage.

OFFERED: Session 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

45. Intermediate Creative Writing Honors

PREREQUISITE: Graded creative writing assignment; previous course or workshop in creative writing

Intermediate Creative Writing Honors provides students an opportunity to develop more advanced writing techniques and concepts. Students experiment with increasingly complex character and plot development, alternate points of view, style and themes in their fiction writing. Poetry writing incorporates more advanced poetic devices and forms. Students are expected to produce a significant amount of work (approximately 20 to 30 pages of writing) for their class portfolios.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

NOTE: Students enrolled in Creative Writing Honors at CTD during session 2 will be given a placement assessment on the morning of the first day of class. Based on the results of that assessment, students will be placed into either Introduction to Creative Writing Honors or Intermediate Creative Writing Honors.

NEW! 44. 21st Century Literature Honors: Secrets & Lies

PREREQUISITE: Graded writing assignment

Using secrets as a guiding theme, students examine current works of fiction, poetry, drama and non-fiction, and develop skills necessary to be successful in high school and college literature courses. Through reading, analysis, discussion and writing assignments, students discover common themes, reveal historical references and contexts, and discuss 21st century literature as a genre. Shared writing generates peer and instructor feedback, and formal critique and revisions prepare students for high school and college-level writing. This course also helps students prepare for the critical reading and writing sections of the SAT® and the English and Reading sections of the ACT®.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

46. Non-Fiction Writing Honors: From Structure to Style

PREREQUISITE: Graded writing assignment

In this intensive writing course, students master the fundamentals of several key forms of writing required for success at the high school level. Students learn methods of organization and practice myriad academic writing forms, including evaluation of texts and media, research writing, and literature review, all culminating with a rhetorical analysis of their own writing. Students develop a deeper understanding of grammatical structure and writing styles and learn how to express voice within formulaic constructs as they compose essays according to prompts. This class prepares students for advanced high school writing and AP® English courses.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

47. Non-Fiction Writing Honors: The Art of the Essay

PREREQUISITE: Graded writing assignment

“The role of a writer is not to say what we all can say, but what we are unable to say.” —Anaïs Nin

Exceptional essayists use the written word to present a point of view, prompt a reader to action, or bring an issue to life. In this intensive writing course, students learn the fundamentals of effective essay writing and become better readers and critical thinkers in the process. Using a range of essays as models, students discuss and practice essay writing, focusing on the persuasive, critical, narrative and personal forms. Students learn about audience, purpose, point of view and more. This class prepares students for advanced high school writing and AP® English courses.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

Social Science & Humanities

ADMISSION CRITERIA: EXPLORE®
R ≥ 18; SAT Crt. R ≥ 510; ACT R ≥ 22; or Admission Portfolio

NOTE: For all Social Science & Humanities courses, residential students are highly encouraged to bring a small personal printer.

48. Persuasion & Debate Honors

Students in Persuasion & Debate Honors will address salient social issues and develop skills in critical thinking, public speaking, argumentation and writing through lectures and discussions, reflective writing, persuasive essays, speeches and structured debates. This course focuses on the principles and practices of effective communication in a variety of speaking situations that students encounter in school and later in life as adults. After completing this course, students will be prepared for advanced study in honors English, humanities and social sciences, and will be able to participate in various forms of competitive debate.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

49. Human Rights & Foreign Policy Honors

Since the conclusion of WWII, global relations have been dominated by U.S. foreign policy, leaving the United States both admired and reviled by other nations. This course provides an introduction to foreign policy issues via the study of media, theories and the role of international nation states and actors. Students analyze means of international cooperation, such as economic globalization, international legal frameworks, environmental agreements and diplomacy. Participants study competing issues of civil conflict, national security and human rights in the context of contemporary global topics such as the recent ISIS uprising, emerging economies and climate change. Readings and discussions are complemented by guest presentations, field trips and structured writing experiences in order to help students hone their critical-thinking and persuasive-writing abilities.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

50. Documentary Filmmaking: The Language of Now

Are you compelled to explore complex societal questions that lack easy answers? Do political issues fire you up and clichéd answers inspire you to dig further? If so, then documentary filmmaking is for you! Students study the art of documentary as a tool for exploring and explaining the world around them.
Students create short films, learning the basics of a “shoot” including techniques for framing, interviewing, narrating, editing and more. As a final project students will incorporate their newfound knowledge into a single short documentary to be screened on the last day of class.

NOTE: Students are required to bring a laptop computer for use in the course (not a tablet).

OFFERED: Session 2

HIGH SCHOOL CREDIT OFFERED: 1 semester

51. Brain & Behavior: Introduction to Psychology Honors

Why do people do what they do? Why are we the way we are? What makes some behavior “normal” and other behavior “abnormal”? This course focuses on the structures and functions of the brain, neurons, and nervous system; the relationship between brain activity and thought and behavior; and the role of biological, environmental, social and individual factors in psychological experience. By participating in dynamic lectures, group activities, debates and hands-on projects, students examine key theories, individuals and experiments in the field of psychology in order to gain a better understanding of scientific research and psychological thought. This is an excellent introduction for students interested in behavioral science or advanced-level psychology courses.

OFFERED: Sessions 1 & 2

HIGH SCHOOL CREDIT OFFERED: 1 semester

Business & Entrepreneurship

ADMISSION CRITERIA: EXPLORE® R ≥ 16; SAT Crit. R ≥ 510; ACT R ≥ 22; or Admission Portfolio

52. Bubbles & Crashes: Introduction to Economics Honors

Is Apple® stock overvalued? What will Alibaba® do with all the money it raised in the biggest global IPO ever? How do decisions by individuals, corporations and governments affect markets? Through readings by prominent economists, discussions and case studies, students examine economic booms and crises of the past and present, focusing on concepts such as risk, supply and demand, marginal utility, and the fundamentals of investing. This course develops critical-thinking skills through discussion and writing experiences and is intended for students interested in future coursework in economics, political science, international relations or other advanced social science courses.

OFFERED: Session 1

HIGH SCHOOL CREDIT OFFERED: 1 semester

NEW! 53. From the Ground Up: Small Business Honors

In this novel course, students will work with a partner to develop a solid, professional plan for a small business start-up. Students will research the various requirements and costs associated with opening a new business, meet and learn tips of the trade from local entrepreneurs, and gain invaluable experience with business planning and decision making processes. The course concludes with a simulation of operations and reactions to variables, both in and out of their control, using techniques and tools to track and analyze business performance. Students will be tasked with the daunting goal of surviving their first year of operation, and, if possible, earning a profit.

OFFERED: Session 2

HIGH SCHOOL CREDIT OFFERED: 1 semester

Mathematics

ADMISSION CRITERIA: EXPLORE® M ≥ 17; SAT M ≥ 520; ACT M ≥ 22; or Admission Portfolio

NOTE: A graphing calculator is required for all mathematics courses.

54. Algebra I Honors

This course is intended for students who have already studied the introductory ideas of algebra and are ready to extend their knowledge in an intensive, full-year course. Algebra I Honors covers equations and functions, properties of real numbers, solving and graphing linear equations and functions, solving and graphing linear inequalities, exponents and exponential functions, polynomials and factoring, quadratic equations and functions, radicals and geometry connections, and rational equations and functions. Algebra I Honors is a full-year high school course in an accelerated format. This course is intended for students who are ready to accelerate and plan to enroll in Algebra II or Geometry in the fall.

OFFERED: Session 1

HIGH SCHOOL CREDIT OFFERED: 2 semesters

55. Algebra II & Trigonometry Honors

PREREQUISITE: Algebra I

Algebra II & Trigonometry Honors covers systems, equations, polynomial arithmetic, complex numbers, solutions of quadratic equations, exponential and logarithmic functions, sequences, series, graphs of polynomial functions, conic sections and concepts in trigonometry, including trigonometric identities. Algebra II & Trigonometry Honors is a full-year high school course in an accelerated format. This course is intended for students who are ready to accelerate and plan to enroll in a pre-calculus course in the fall.

OFFERED: Sessions 1 & 2

HIGH SCHOOL CREDIT OFFERED: 2 semesters

56. Geometry Honors

PREREQUISITE: Algebra I

Geometry Honors covers formal proofs, logic and deductive reasoning, constructions, congruence and similarity, parallels and perpendiculars, polygons and circles, transformations and problem solving using advanced technology. Geometry Honors is a full-year high school course in an accelerated format. This course is intended for students who are ready to accelerate and plan to enroll in the next level course in their school.

OFFERED: Sessions 1 & 2

HIGH SCHOOL CREDIT OFFERED: 2 semesters

Science

ADMISSION CRITERIA: Varies by course; please see individual course descriptions.

57. Fundamental Physics Honors: Force & Motion

PREREQUISITE: Algebra I

Since Newton, force has been one of the most important concepts in physics. Force is fundamental to physics on the small scale (subatomic particles), physics on the large scale (planets and stars) and everything in between. This course explores a variety of fascinating phenomena in the physical world and the way in which physics explains the motion of large and tiny objects. This includes electrons in an electrical circuit, roller coasters, planets, the light that we use to see, and the sounds we hear. Hands-on lab exercises complement the course material and allow for the derivation of important physics concepts. Fundamental Physics Honors is excellent preparation for more advanced physics coursework such as Physics Honors and AP® Physics.

NOTES:
• A scientific or graphing calculator is required.
• Additional $125 lab fee required.

OFFERED: Session 1

HIGH SCHOOL CREDIT OFFERED: 1 semester

ADMISSION CRITERIA: EXPLORE® R ≥ 14 + EXPLORE® M ≥ 17; SAT Crit. R ≥ 440 + SAT M ≥ 520; ACT R ≥ 19 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio

58. Non-Calculus Based Physics Honors

PREREQUISITE: Algebra I

“Enhance the way you see the physical world.” —Paul G. Hewitt, physicist.

In this course, students build a strong conceptual understanding of physical principles ranging from force and motion to classical mechanics. With this foundation, students are equipped to understand the equations and formulas of physics and to make connections between concepts and their everyday world. This course is a full-year physics curriculum
intended for students who attend schools with a physics first science sequence and who plan to accelerate through the high school science curriculum. Students who plan to take Physics at their academic year school are encouraged to take Fundamental Physics Honors: Force & Motion. Non-Calculus Based Physics Honors prepares students for more advanced physics topics and AP® Physics.

**NOTES:**
- A scientific or graphing calculator is required.
- Additional $125 lab fee required.

**OFFERED:** Session 2

**HIGH SCHOOL CREDIT OFFERED:** 2 semesters

**ADMISSION CRITERIA:** EXPLORE® R ≥ 16 + EXPLORE® M ≥ 17; SAT Crit. R ≥ 510 + SAT M ≥ 520; ACT R ≥ 22 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio

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**59. Chemistry of Color Honors:**
**From Picasso to Fireworks**

**PREREQUISITE:** Algebra I

This course explores chemistry through the theme of color. The chemistry behind the color of everyday objects such as neon lights, fireworks, and natural and synthetic pigments is used to introduce fundamental concepts that include atomic structure, chemical bonding, chemical reactions, solutions, structures of molecules and solids and organic functional groups. The relationship of chemistry to other fields such as physics, life sciences, earth science and art are discussed throughout the course. An interest in art is recommended, but not required. This course provides students with an introduction to chemistry lab procedures and lab reports and is excellent preparation for Honors Chemistry.

**NOTES:**
- A scientific calculator is required.
- Additional $125 lab fee required.

**OFFERED:** Session 1

**HIGH SCHOOL CREDIT OFFERED:** 1 semester

**ADMISSION CRITERIA:** EXPLORE® R ≥ 14 + EXPLORE® M ≥ 17; SAT V Crit. R ≥ 440 + SAT M ≥ 520; ACT R ≥ 19 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio

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**60. Topics In Chemistry Honors**

**PREREQUISITE:** Algebra I

Do you know the common name for acetyl salicylic acid? Hint: it can relieve a headache and reduce the risk of heart attack and stroke. This course is designed to expand students’ understanding of the chemistry in everyday surroundings. This laboratory-based course exposes students to the fundamentals of chemistry, including; atomic theory, stoichiometry, chemical reactions, intermolecular forces, periodic trends, and acids and bases. Daily lab experiments give students a hands-on learning experience. Using an inquiry approach, students explore concepts, adjust variables independently and use their findings to determine next steps. This course provides a foundation for advanced studies in chemistry.

**NOTES:**
- A scientific calculator is required.
- Additional $125 lab fee required.

**OFFERED:** Session 2

**HIGH SCHOOL CREDIT OFFERED:** 1 semester

**ADMISSION CRITERIA:** EXPLORE® R ≥ 14 + EXPLORE® M ≥ 17; SAT V Crit. R ≥ 440 + SAT M ≥ 520; ACT R ≥ 19 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio

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**61. Introduction to Biomedicine Honors**

For millions of years the human body has been evolving, yet it still presents challenges and mysteries. In this course, students explore connections between groundbreaking medical research that has revealed insights into the body’s molecular and cellular processes and how that knowledge is applied to medical practice and treatments. Examination of essential biochemical reactions that occur in the body acquaint students with topics in chemistry; physics is included in the form of investigating biomechanics; and areas of biology such as cell biology are explored. This course is an excellent introduction for students interested in the study of medicine or advanced laboratory courses.

**NOTES:**
- Additional $125 lab fee required.
- This course will use a classroom and lab space at Roycemore School. Residential students will live on campus and take a short bus ride daily to class.

**OFFERED:** Sessions 1 & 2

**HIGH SCHOOL CREDIT OFFERED:** 1 semester

**ADMISSION CRITERIA:** EXPLORE® R ≥ 16; SAT Crit. R ≥ 510; ACT R ≥ 22; ACT S ≥ 23; or Admission Portfolio

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**62. Biology Honors**

**PREREQUISITE:** Completion of a laboratory science course

Biology comes alive in this fast-paced high school honors course, emphasizing the principles that apply to plants and animals. As a supplement to class discussion, text readings and demonstrations, students spend class time in a laboratory performing experiments and learning methods of scientific investigation. Biology Honors is a full-year course in an accelerated format and is designed for students who intend to accelerate in science. Students who plan to take biology at their academic-year school are encouraged to enroll in either Introduction to Biomedicine Honors or Topics in Biology Honors. This course prepares students for honors Human Biology and AP® Biology.

**NOTES:**
- Additional $125 lab fee required.
- This course will use a classroom and lab space at Roycemore School. Residential students will live on campus and take a short bus ride daily to class.

**OFFERED:** Session 1

**HIGH SCHOOL CREDIT OFFERED:** 2 semester

**ADMISSION CRITERIA:** EXPLORE® R ≥ 16; SAT Crit. R ≥ 510; ACT R ≥ 22; ACT S ≥ 23; or Admission Portfolio

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**63. Topics in Biology Honors**

Biology is the study of living organisms, progressing from the molecular level to cellular on through organism, ecosystem to entire biosphere. Students practice lab design and presentations, problem-based and project-based experiments. Among the topics explored are experimental method, biochemistry, cell structure, cellular reproduction, evolution and ecology. This course is recommended for students with some knowledge of laboratory techniques or those who have not had a full year of high school laboratory science. Topics in Biology prepares students for high school biology.

**NOTES:**
- Additional $125 lab fee required.
- This course will use a classroom and lab space at Roycemore School. Residential students will live on campus and take a short bus ride daily to class.

**OFFERED:** Session 2

**HIGH SCHOOL CREDIT OFFERED:** 1 semester

**ADMISSION CRITERIA:** EXPLORE® R ≥ 16; SAT Crit. R ≥ 510; ACT R ≥ 22; ACT S ≥ 23; or Admission Portfolio

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“I loved the sense of community that I felt from students and staff.”

—2014 Spectrum student
Innovative company in residence at 1871 in the historic Merchandise Mart in Chicago which trains aspiring programmers and web designers and is “where people from all over the world come to learn how to code, design, and ship web apps” (www.starterleague.com). Starter League courses are taught by coding and web development professionals and focus on the critical skills students need to be successful in programming.

Design & Engineering

ADMISSION CRITERIA: Varies by course; please see individual course descriptions.

NEW! 66. Robotics Honors:
VEX® the Competition
PREREQUISITE: Algebra I
VEX EDR® is a robotics system utilizing multiple motors and subsystems that interact to provide the speed, power, torque and lift to execute tasks. Utilizing all facets of STEM curriculum, students work in teams of three within Autodesk Inventor and Inventor Studio to analytically, strategically and intelligently design, engineer, build and program a competition robot. Using Cortex Microcontrollers, a VEXnet® Joystick and the VEXnet® Wireless link students square off against their classmates to perform their robot’s targeted task. Used in the world famous FIRST® Tech and Robotics challenges, VEX® robotics teaches students engineering, design, building and collaborative skills crucial in emerging design and engineering careers.

NOTE: Additional $150 materials fee required.
OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester
ADMISSION CRITERIA: EXPLORE® M ≥ 17; SAT M ≥ 520; ACT M ≥ 22; Admission Portfolio

67. 3D Printing & Product Design with the Segal Design Institute
Design and prototype a product of your own creation in this hands-on design studio course offered in partnership with the Segal Design Institute at Northwestern University. The course will explore and evaluate Northwestern University's own rapid prototyping services in the context of the human-centered design process. Learn the fundamentals of 3D design through physical and digital modeling, prototyping and discussion. Students use 3D printing to evaluate design ideas, provide user testing and get feedback as well as test product readiness for distribution through Shapeways, an online 3D printing marketplace.

NOTES:
• Partnership course—please see tuition chart for more information.
• A laptop computer (not a tablet) is required for this course.
• For information about the Segal Design Institute and this partnership, please see page 41
OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester
ADMISSION CRITERIA: EXPLORE® R ≥ 16; SAT Crit. R ≥ 510; ACT R ≥ 22; or Admission Portfolio

68. Visual Communication through Graphic Design
Explore the fundamental elements of visual communication from typography to branding to product design. Through a series of real-world exercises and hands-on studio sessions using Adobe Illustrator, Photoshop, and Adobe InDesign, students build a foundation for print, online and multi-platform visual communication. Complementing the technical portion of the course, students will have a daily sketchbook activity and readings on design history, contemporary design and global brand awareness. Field trips, films and readings will help students explore the challenges faced by 21st century designers.

NOTES:
• Additional $125 lab fee required.
• A laptop computer (not a tablet) is required for this course.
OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester
ADMISSION CRITERIA: EXPLORE® R ≥ 16; SAT Crit. R ≥ 510; ACT R ≥ 22; or Admission Portfolio
Equinox & Civic Leadership Institute

Grades 9–12
(grade level on January 1, 2015)

High school students have two different CTD Summer Program options from which to choose. The Equinox Program provides accelerated, for-credit academic courses in a variety of subject areas. The Civic Leadership Institute (CLI) is a leadership and service-learning program that combines academic study with hands-on education and meaningful service.

**Apply Early! Application Period Begins January 15**

**Equinox**

Equinox creates a rigorous, fast-paced learning environment for academically talented students in grades 9 through 12. Equinox courses provide students the opportunity to earn high school credit for advanced high school and college-level subjects through the Center for Talent Development. Students take a single course that meets five-and-a-half hours per day, five days per week. Please check the Details sections (page 43) for additional information.

Most Equinox courses are three weeks in length, but to comply with College Board curriculum standards, AP® Chemistry, AP® Biology, and AP® Physics 1 are offered as five-week courses. This allows for the completion of all required lab experiences and good AP® exam preparation.

Advanced Placement (AP®) courses: The College Board requires course review and approval for all institutions offering AP® courses. Because the approval timeline is later than our publication deadline, not all courses have completed the approval process by the time this brochure is printed. We will update AP® approvals on the Center for Talent Development website in late 2015 at www.ctd.northwestern.edu/summer.

**Career Exploration & Partnership Courses**

Collaborations in high-interest, high-demand fields provide exciting course options not typically available to high school students. Collaborators include:

- The Starter League at 1871 in the Merchandise Mart
- Windy City Labs in the West Loop
- Mobile Makers Academy in River North
- Northwestern University’s Segal Design Institute on the Evanston campus
- The Chicago Botanic Garden in Glencoe, Illinois
**EQUINOX:** Grades 9–12 at Northwestern University, Evanston and Chicago, IL (residential and commuter)

**Session 1: June 28–July 17**

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**Session 2: July 19–August 7**

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**CIVIC LEADERSHIP INSTITUTE:** Grades 9–12 in Chicago, IL (residential only)

**July 5–July 24**

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<td>Service, Leadership &amp; Community Transformation</td>
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“The teacher is so awesome that she is listed as a contributor to our textbook. How cool is that?!”

—2014 Equinox student
Equinox Course Descriptions

English & Language Arts

ADMISSION CRITERIA: SAT Crit. R ≥ 510; ACT R ≥ 22; or Admission Portfolio

NOTE: For the following courses, residential students are urged to bring a small printer.

69. Creative Writing Honors
PREREQUISITE: Graded writing sample, preferably creative writing

Reading contemporary literature, students refine their critical reading and creative writing skills through analysis, discussion and extensive writing exercises. Students focus on structure, imagery, detail, dialogue and narrative across genres, including poetry, fiction and creative non-fiction. Students give and receive critique in a workshop format led by the instructor. Students will submit a final portfolio of original work that showcases their skill with revision.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

70. Advanced Creative Writing Honors
PREREQUISITEST: Graded creative writing sample with teacher comments; some workshop experience or previous creative writing course preferred

Designed for students with some experience and considerable interest in creative writing, this course pairs adventurous reading with rigorous writing in a variety of genres, including poetry, fiction and creative non-fiction. Assignments advance students’ skills through intensive attention to imagery, voice, setting, character and narrative. The workshop format reinforces the virtues of feedback and revision. Students develop one extended piece or several shorter pieces for their final project.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

71. Screenwriting Honors
PREREQUISITE: Graded writing sample

To create notable films, directors such as Godard, Nolan, Kubrick and Coppola wrote first. Designed for individuals with considerable interest in creative writing and drama, students read and analyze exemplary screenplays to develop critical reading and creative writing skills. Viewing seminal films, students examine structure, character, dialogue, format, voice, scope, pace and setting. Students also study and practice adaptation from other genres of storytelling. Students workshop original scenes and write a short screenplay as a final project.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

72. Third Coast Story Slam Honors
PREREQUISITE: Graded writing sample

From elevator pitch to valedictory, this course is designed to give aspiring orators a stage for persuasive storytelling. Students practice modes of persuasion and narrative structure, including interpretive, lyrical, autobiographical, argumentative, informative and comedic modes used in slam, the Moth, TED Talks, 2nd Story and stand-up conventions. The course culminates in a story slam that readsies students to hold any audience’s attention.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

73. College Composition & Rhetoric
PREREQUISITE: Graded writing assignment; one year of high school honors English

In this intensive, workshop-based course, students learn to write persuasively for a range of purposes. Covering personal, observation, argument and other modes, students read and analyze a variety of complex texts and synthesize information to create cogent arguments. Working closely with peers and the instructor, students finish the course with a portfolio of essays worthy of any college classroom.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

Social Sciences & Humanities

ADMISSION CRITERIA: SAT Crit. R ≥ 510; ACT R ≥ 22 or Admission Portfolio

NOTE: For the following courses, residential students are urged to bring a small printer.

74. Global Economy Honors
PREREQUISITE: Graded writing assignment

Students are introduced to the basic principles of economics by examining the economic issues of our time, exploring the forces that lead to globalization and analyzing and interpreting events from the standpoint of multiple stakeholders. Topics such as informal economies, the role of human rights, non-governmental organizations, sustainable development and trade policies are addressed through case studies, discussions, research and critiques. This interdisciplinary course draws from international studies and economics scholarship, preparing students for college-level courses in economics and global studies.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

75. Economics of Everything Honors
PREREQUISITE: Graded writing assignment

If, as Levitt and Dubner (Freakonomics) have proposed, economics is the study of human behavior, then is your life governed by the economic choices you make? Economics of Everything introduces students to economic theory, including incentives, supply and demand, competition, markets and prices, game theory, and the role of government in economic systems. Students apply their knowledge to contemporary case studies, reading, analyzing, and discussing authors such as Levitt, Dubner, Schelling, Becker, Ehrenreich and others. This course is an excellent foundation for students interested in international studies, economics, data science and business.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

76. United States Law & Politics Honors
PREREQUISITE: Graded writing assignment

Our politicians and government officials are celebrities; their lives and actions make headlines and their decisions have significant impact. In this exciting course, students use the media narrative of campaigns to examine the history and significance of the U.S. Constitution, the Supreme Court and federal structure, and gain an appreciation for the interplay of law and politics in American society. The course provides an in-depth analysis of several Amendments to the Constitution and allows students to interpret current events using the Bill of Rights as a critical lens. Students interested in law, politics, public policy, journalism and media studies will enjoy this course.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

77. International Relations Honors
PREREQUISITE: Graded writing assignment

As Thomas Friedman states in The World is Flat, “Knowing how to deal with people of other nations is critical to success.” Through an interdisciplinary approach, students analyze current issues, including immigration, terrorism, environmental degradation, cultural diffusion, oil politics, human trafficking, technological advances, and more. Students interested in political science, international business, public policy and global studies are encouraged to take this course.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester
78. AP® Psychology (designation pending)
PREREQUISITE: Graded writing assignment
The study of human behavior offers insights that help us better manage ourselves and the world we live in. AP® Psychology covers principles of each of psychology’s major subfields and the methods psychologists use in research and practice. Topics include the biological basis of behavior, sensation and perception, cognition, personality, social psychology and abnormal psychology. Students review case studies, participate in class discussions and analyze experiment design, while practicing AP®-style questions and essays. This course prepares students for the AP® Psychology exam, and is the full-year course in an accelerated format.
OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 2 semesters

NEW! 79. Critical Discourse: Tackling Big Questions with Confidence
PREREQUISITE: Graded writing assignment
In a time when many debates may seem mired in empty rhetoric, this course digs beneath the surface. Critical Discourse is a college-level survey of the most prominent ethical theories (e.g. consequentialism, Kantianism, moral relativism), which lend depth and scope to discussions about the hottest topics of our time. Students learn how to use logic and philosophical reasoning to consider contemporary issues (such as social welfare, gender and sexuality, or stem cell research) in a larger context. This course enriches students’ understanding of science, medicine and public policy and develops their abilities to analyze and evaluate arguments, write and discuss thoughtfully, and think critically and analytically about ethical issues.
OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

Business & Entrepreneurship

ADMISSION CRITERIA: SAT M ≥ 520; ACT R ≥ 22 or Admission Portfolio

NEW! 80. Data Science Honors: The Metrics of Change
PREREQUISITE: Algebra I
As our ability to measure the world multiplies, so does the data itself. In the June 2014 issue of Wired magazine, journalist Linda Burtch argues that data science is the new six-figure profession. Nate Silver of ESPN’s FiveThirtyEight uses big data to analyze everything from politics to sports, modeling predictions news analysts and regular folk can use daily. This course explores the newly articulated world of data science in its full range of applications. Exploring and using theories of probability, students learn how to turn data into “moneyball.” Students identify, collect and interpret data toward proposals for action. This course will inspire students interested in business management, marketing, finance, mathematics, public policy and social welfare.
OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

81. Mini MBA
PREREQUISITES: Algebra I and II
What does it take to manage a business successfully? Quite a lot it turns out. This course is a survey of the fundamentals of business such as strategic planning for growth, organizational design, and marketing. Students also study analytic tools for decision-making and frameworks to communicate effectively and to implement strong decisions. Finally, students learn how to prepare presentations for stakeholders and to develop a business plan that will hold up to a “shark-tank” feedback environment. Students will deepen their collaborative presentation and leadership skills, learn to think strategically and cross-functionally, and to integrate ambiguity and uncertainty into their project management.
OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

Leadership & Service

101. Service, Leadership & Community Transformation
Students interested in service and social issues should consider the Civic Leadership Institute. For admission criteria and details, see page 42 for details.

Mathematics

ADMISSION CRITERIA: SAT M ≥ 520; ACT R ≥ 22 or Admission Portfolio

82. Algebra II & Trigonometry Honors
PREREQUISITE: Algebra I
This course focuses on topics of systems, equations, polynomial arithmetic, complex numbers, solutions of quadratic equations, exponential and logarithmic functions, sequences, series, graphs of polynomial functions, conic sections and concepts in trigonometry including trigonometric identities. Algebra II & Trigonometry is a full-year high school course presented in an accelerated format, and successful completion of the course prepares students for the next level of math coursework in their school’s math sequence.
OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

83. Pre–Calculus Honors
PREREQUISITES: Algebra I and II with Trigonometry; Geometry
Pre-Calculus Honors builds upon advanced algebra. Topics include line, quadratic, polynomial, exponential, logarithmic and trigonometric functions. Students apply vectors, sequences, series and matrices to solve problems. Advanced topics in functions and graphs, trigonometry and discrete mathematics are also covered. Pre-Calculus Honors is a full-year high school course in an accelerated format, and prepares students for taking AP® Calculus AB and/or BC.
OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

84. AP® Calculus AB (designation pending)
PREREQUISITES: Algebra I, Algebra II with Trigonometry, Geometry and Pre-Calculus or Pre-Calculus equivalent
Rocket scientist or brain surgeon, architect or engineer, the study of calculus is the foundation for many professional endeavors. This college-level calculus course covers analytic geometry, functions, limits, continuity, derivatives, integrals and their applications. It explores symbolic differentiation and integration utilities as students apply these skills to solve problems. AP® Calculus AB is a full-year high school course in an accelerated format. Upon successful completion, students are prepared to take the AP® Calculus AB exam.
OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 2 semesters
85. AP® Calculus BC (designation pending)  
PREREQUISITES: AP® Calculus AB  
Students in this course continue work begun in AP Calculus AB. Students continue to analyze functions and planar curves graphically, numerically, and verbally. Students analyze planar curves in parametric, polar and vector forms. Through collaborative inquiry and direct instruction, students further develop their abilities with differentiation and applications of derivatives, differential equations and techniques of anti-differentiation such as integration by parts, partial fractions and improper integrals. Also included are numerical and polynomial approximations and series. This is the two-semester capstone of advanced high school mathematics and readies students for advanced calculus at the university level. Upon successful completion, students are prepared to take the AP® Calculus BC exam.  
OFFERED: Session 2  
HIGH SCHOOL CREDIT OFFERED: 2 semesters  
ADMISSION CRITERIA: SAT Crt. R ≥ 510 + SAT M ≥ 520; ACT R ≥ 22 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio  

NEW! 88. AP® Physics 1 & 2  
This course runs for five weeks and attendance for all weeks is required.  
PREREQUISITES: Geometry, Algebra II with Trigonometry and Pre-Calculus; one year of high school physics (Physics First or Honors Physics.)  
Considering a science major in college? This course is your next move. This compressed two-year course combines topics from both AP® Physics 1 & 2: kinematics, dynamics, gravitation and circular motion, work, energy, power and linear momentum, torque and rotational motion, simple harmonic motion, waves, and sound, electrostatics, simple electric circuits, mechanical waves and sound, thermodynamics, fluid statics & dynamics, magnetism and electromagnetic induction, optics, and quantum, atomic & nuclear physics. Upon successful completion, students will be prepared to take the AP® Physics 1 & 2 exams in May.  
NOTES:  
• Additional $150 lab fee required.  
• This course runs for five weeks: June 28–July 31.  
• A scientific calculator is required.  
HIGH SCHOOL CREDIT OFFERED: 4 semesters  
ADMISSION CRITERIA: SAT Crt. R ≥ 510 + SAT M ≥ 520; ACT R ≥ 22 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio  

89. Chemistry Honors  
PREREQUISITES: Biology Honors OR Physics Honors; Algebra I & II  
How does an atom account for the nature of matter? In this course, participants study the modern principles of chemistry, including atomic models, valence and ionization, bonding, nomenclature of formulas, moles, stoichiometry, gas laws, molecular forces, polarity, solutions, equilibrium, acids and bases, thermochemistry, and oxidation-reduction. Through experiments, students learn to use proper lab techniques, record and analyze data and produce scientific lab reports. Chemistry Honors is a full-year course in an accelerated format.  
NOTES:  
• A scientific calculator is required.  
• Additional $150 lab fee required.  
OFFERED: Sessions 1 & 2  
HIGH SCHOOL CREDIT OFFERED: 2 semesters  
ADMISSION CRITERIA: SAT Crt. R ≥ 510 + SAT M ≥ 520; ACT R ≥ 22 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio  

90. AP® Chemistry (designation pending)  
This course runs for five weeks and attendance for all weeks is required.  
PREREQUISITE: One year of Chemistry Honors; Algebra I & II  
This course focuses on thermodynamics, thermochemistry, the physical behavior of gases, states and structure of matter, chemical equilibrium and kinetics, and various chemical reactions. Daily laboratory work emphasizes competency in solving chemical calculations and problems. In the accelerated format, this rigorous and lab-heavy course requires significant study and dedication. Upon successful completion, students are prepared to take the AP® Chemistry exam.  
NOTES:  
• A scientific calculator is required.  
• Additional $150 lab fee required.  
• This course runs for five weeks: June 28–July 31.  
HIGH SCHOOL CREDIT OFFERED: 2 semesters  
ADMISSION CRITERIA: SAT Crt. R ≥ 510 + SAT M ≥ 520; ACT R ≥ 22 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio  

91. Biology Honors  
PREREQUISITE: Completion of a laboratory science course  
Biology comes alive in this fast-paced high school honors course, emphasizing the principles that apply to plants and animals. As a supplement to class discussion, text readings, and demonstrations, students spend class time in a laboratory performing experiments and learning methods of scientific investigation. Biology Honors is a full-year course in an accelerated format and is designed for students who intend to accelerate in science. This course prepares students for honors Human Biology and AP® Biology.  
NOTES:  
• Additional $150 lab fee required.  
• This course will be using classroom and laboratory space at Roycemore School. Residential students will live on campus and take a short bus ride daily to class.  
OFFERED: Session 2  
HIGH SCHOOL CREDIT OFFERED: 2 semesters  
ADMISSION CRITERIA: SAT Crt. R ≥ 510 + SAT M ≥ 22; ACT S ≥ 23; or Admission Portfolio  

92. Human Biology: Anatomy & Physiology Honors  
PREREQUISITE: One year of Biology Honors  
This course covers the chemistry of cellular life, cell structure and function, human organization, major systems of the human body, human and medical genetics, DNA and biotechnology, human evolution, ecology and population concerns. Students perform dissections, as well as experiments in molecular genetics, histology
and chemical composition of cells. This course is ideal for students interested in medicine or veterinary science and provides preparation for AP® Biology.

NOTES:
• This course will use a classroom and lab space at Roycemore School. Residential students will live on campus and take a short bus ride daily to class.
• Additional $150 lab fee required.

OFFERED: Session 1

HIGH SCHOOL CREDIT OFFERED: 1 semester

ADMISSION CRITERIA: SAT Crit. R ≥ 510; ACT R ≥ 22; ACT S ≥ 23; or Admission Portfolio

NEW! 93. Biotech: From Microbes to Genomes Honors

PREREQUISITE: Two years of lab science; one year must be Biology Honors

Using your genetic information and current biotechnology techniques, scientists can identify and potentially eliminate genetic diseases, design personalized medicines, and even engineer microorganisms to do their bidding. This course explores the current experimental techniques and applications scientists use in biotechnology. Learning college-level concepts in genetics, molecular biology, biochemistry, microbiology, and genetic engineering, students will practice modern biological laboratory techniques utilized in both research and industrial settings, including gene cloning, DNA and protein electrophoresis, chroma-tography, protein purification, enzyme and immunology assays, and bacterial cell culture. Through case studies and individual research, students will discuss the ethical and social implications raised by the applications of biotechnology.

NOTES:
• This course will use a classroom and lab space at Roycemore School. Residential students will live on campus and take a short bus ride daily to class.
• Additional $150 lab fee required.

OFFERED: Session 2

HIGH SCHOOL CREDIT OFFERED: 1 semester

ADMISSION CRITERIA: SAT Crit. R ≥ 510; ACT R ≥ 22; ACT S ≥ 23; or Admission Portfolio

94. AP® Biology (designation pending)

This course runs for five weeks and attendance for all weeks is required.

PREREQUISITE: One year of Biology Honors

How do stem cells differentiate into a diverse range of cell types? In AP® Biology, coursework is centered on three general areas: molecules and cells; heredity and evolution; and organisms and populations. Students develop a framework for understanding modern biology and engage in the scientific process through lab experiments, readings, lecture, and discussion. AP® Biology is a full-year high school course in an accelerated format designed to be the equivalent of an introductory, college-level biology course, and prepares students to take the AP® Biology test.

NOTES:
• This course will use a classroom and lab space at Roycemore School. Residential students will live on campus and take a short bus ride daily to class.
• Additional $150 lab fee required.
• This course runs for five weeks: June 28–July 31.

HIGH SCHOOL CREDIT OFFERED: 2 semesters

ADMISSION CRITERIA: SAT Crit. R ≥ 510; ACT R ≥ 22; ACT S ≥ 23; or Admission Portfolio

NEW! 95. Environmental Engineering: Saving the Planet with the Chicago Botanic Garden

PREREQUISITES: Honors Biology; Algebra I & II

Students in this course will work with Northwestern University PhD Fellows, as well as Chicago Botanic Garden research scientists, as they drive regional conservation efforts using the emerging field of geomatic technology. Students in this college-level course will use geographic information systems (GIS) to define patterns in ecological data and propose changes to our landscapes and public policies. Through field and lab research, discussion and lecture, students learn how to collect, interpret, and present syntheses of geomatic data in dynamic, cartographical formats. Additionally, students learn how to choose and use GIS to collect data in an effort to manage our local ecosystems. Students get exposure to a field with career pathways that are growing faster than all other engineering fields combined, according to the U.S. Bureau of Labor Statistics.

NOTES:
• Outside field work at the Chicago Botanic Garden and intensive lab work are key components of this course and will be conducted on site.
• Partnership course—please see tuition chart for more information.

OFFERED: Session 1

HIGH SCHOOL CREDIT OFFERED: 1 semester

ABOUT THIS PARTNERSHIP: The Chicago Botanic Garden is one of the world’s greatest living museums and conservation science centers. Uniquely situated on 385 acres of land on and around nine islands in Glencoe, Illinois, the Garden also encompasses nine laboratories where scientists and graduate students conduct a wide array of research. CTD students will have unique access to cutting edge technology, research, and active science, and the opportunity to contribute to high-level scientific work in process.

ADMISSION CRITERIA: SAT Crit. R ≥ 510; ACT R ≥ 22; ACT S ≥ 23; or Admission Portfolio

Computer Science & Technology

ADMISSION CRITERIA: SAT M ≥ 520; ACT M ≥ 22; or Admission Portfolio

96. AP® Computer Science A (designation pending)

PREREQUISITES: Algebra II; demonstrated experience in one programming language

Java is used in industries ranging from retail to finance to medicine. Students learn to program in Java using keywords, operators and data types to develop solutions to problems, and subsequently to code and compile programs, as well as to compose command-line programs, basic graphics and simple games. Students do not need prior experience with Java, but must have previous programming or computer language experience. This course prepares students for the AP® Computer Science exam.

NOTES:
• A laptop computer (not a tablet) is required for this course.
• Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship. See page 46 for details.

OFFERED: Session 2

HIGH SCHOOL CREDIT OFFERED: 1 semester
Academy, located in San Francisco and Chicago, offers iOS application development programmers and developers in eight weeks.

In this course, students build apps using Swift, Apple’s latest development language for the iPhone and iPad. In a classroom setting designed to mimic a real dev shop students will learn how to build apps and utilize tools that programmer teams use, such as Agile Project Management, and pair programming. By the end of the course, students will not only have the skills to build their own apps, but also improved teamwork and time management skills. This course is taught by professional mobile app developers in the Mobile Makers Dev Shop in downtown Chicago for a true bootcamp experience.

Notes:
- All students are required to bring their own Mac laptop computer (not a tablet) for this course. An iOS device is also recommended (such as an iPod Touch, iPhone or iPad). Students interested in this course but unable to bring a Mac laptop should contact the Equinox Program Coordinator.
- Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship. See page 46 for details.
- Residential students will live on campus and travel on the CTA purple line each day to the Mobile Makers location for class.
- Partnership course—please see tuition chart for more information.

Offered: Session 1
High School Credit Offered: 1 semester

About This Partnership: The Mobile Makers Academy, located in San Francisco and Chicago, offers iOS application development boot camps that turn novices into employable programmers and developers in eight weeks. Mobile Makers’ expert instructors will turn Equinox students into app developers with a compressed, accelerated version of their established bootcamp curriculum.

New! 98. Ruby on Rails: Web Apps for Everyone with the Starter League

Have you ever had an idea for an app but didn’t know how to begin building it? In this course, students will learn HTML, CSS, Ruby, APIs, and SQL in order to build real, functional prototypes. The course is project-based; students will build mobile and database-backed applications to learn and practice programming techniques, and cap the class by building their own application using the skills developed in the course. No technical experience is required, just a strong desire to learn and practice application programming.

Notes:
- Residential students are required to bring their own laptop computer (not a tablet) for work outside of class; commuter students must have access to a computer in their home.
- Residential students will live on campus and travel on the CTA purple line each day to the Merchandise Mart for class.
- For information about the Starter League, please see page 34.
- Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship. See page 46 for details.
- Partnership course—please see tuition chart for more information.

Offered: Session 2
High School Credit Offered: 1 semester

About This Partnership: The Mobile Makers Academy, located in San Francisco and Chicago, offers iOS application development boot camps that turn novices into employable programmers and developers in eight weeks. Mobile Makers’ expert instructors will turn Equinox students into app developers with a compressed, accelerated version of their established bootcamp curriculum.

Design & Engineering

Admission Criteria: SAT Crit. R ≥ 510 + SAT M ≥ 520; ACT R ≥ 22 + ACT M ≥ 22; ACT S ≥ 23; or Admission Portfolio

99. Engineering Design with Northwestern University’s Segal Design Institute

Prerequisite: Algebra II

How do we look at problems, large and small, and create designs that solve them? What does it take to move from problem to ideation to product? In small, flexible teams, students work with clients to solve authentic problems using human-centered design. Teams design a unique solution following a series of steps, including study and frame the problem, collect data through user observation and testing, prototype, iterate and tell the story. The goal of the course is to create a functioning prototype that is a solution to the presented problem. Students in this course spend time in the design shop at the Ford Motor Company Engineering Design Center on campus and work with Northwestern instructors and design engineers.

Note: Partnership course—please see tuition chart for more information.

Offered: Session 1

High School Credit Offered: 1 semester

About This Partnership: The Segal Design Institute at Northwestern is a nationally renowned group of designers and faculty who “see design as the deliberate shaping of the environment in ways that satisfy individual and societal needs. It is a process as much as an outcome, helping to identify core issues, addressing both current and future needs.” (Segal Design Institute website: www.segal.northwestern.edu/about/).

New! 100. Arduino Microcontrollers in Robotics & the Internet of Things

Prerequisite: Algebra II

In this exciting Robotics course, students learn about the fundamentals of digital electronics, an array of sensors, motors, wireless technologies, display technologies, and the fundamentals of the family of Arduino microcontrollers. Applying their new knowledge, students develop skills to program the firmware to build Internet of Things (IoT) devices and an autonomous robot. All programming will be done in C, a dominant language of the robotics and iOS application development industry.

Notes:
- Partnership course—please see tuition chart for more information.
- This course may meet daily in a development shop in downtown Chicago. If so, students will travel downtown daily via the CTA.
- Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship. See page 46 for details.

Offered: Session 2

High School Credit Offered: 1 semester

About This Partnership: Windy City Lab is the brainchild of former IBM Deck5 Software developer Kevin McQuown whose passion for digital electronics inspired this maker space at the new Catalyze Chicago. Windy City Lab believes there is no substitute for learning-by-doing, asking questions, and getting your hands dirty with others. Windy City Lab creates a development shop experience for students interested in stretching their programming and robotics knowledge to new realms.
Civic Leadership Institute

A service-learning program in downtown Chicago
Sunday, July 5–Friday, July 24, 2015

Make Chicago your classroom this summer!
• Learn about social issues
• Serve communities in need
• Develop leadership skills
• Make a difference

Change the world. Start here.
Northwestern University’s Civic Leadership Institute (CLI) combines hands-on education, meaningful service, powerful speakers and seminars and an unforgettable residential experience for a summer that students frequently describe as “life-changing.”

101. Service, Leadership & Community Transformation Honors
Young people often receive the message that they can’t make a difference. That they don’t have the knowledge, skills or motivation to influence issues like poverty, healthcare, education or the environment. That they’re powerless to create change.

Yet there are countless stories that prove this is not the case. Four college students started a sit-in that fueled the civil rights movement, and thousands of young people powered the peaceful protests that ended legal segregation. One 13-year-old, with a group of 7th grade classmates, founded a youth-led organization that has fought against child labor and built schools and health clinics in villages around the world. Those are just a few examples.

What power, passion and resources do you possess? At the Civic Leadership Institute, you’ll begin your discovery.

CLI students explore the complex challenges that affect our communities and develop the knowledge, experience and leadership skills they need to make a positive impact on the world.

Experience Chicago
CLI participants live and learn in the heart of downtown Chicago. This ideal central location offers unparalleled access to Chicago’s Loop and historic neighborhoods throughout the city. Service experiences immerse students in vibrant communities like Bronzeville, Chinatown and Pilsen, while recreational activities allow students to explore cultural sites and tourist attractions like Navy Pier, Millennium Park and the Magnificent Mile. Living downtown provides students with an exceptional opportunity to experience all that this incredible city has to offer!

NOTES:
• Service-learning credit offered:
  25 to 100 hours
• Residential students only

ADMISSION CRITERIA: Above-grade-level SAT or ACT test; OR ≥ 90th national percentile rank in verbal or reading on standardized achievement test OR an Admission Portfolio

For More Information
Civic Education Project
Phone: 847/467-2572
E-mail: cep@northwestern.edu
Web: www.ctd.northwestern.edu/cep

For students completing grades 7 or 8 interested in service-learning, please consider:
42. Taking Action: Leadership & Service Honors
(Please see detailed course description on page 30).

“The field experiences made everything we had learned in the classroom real and tangible.”
—2014 Civic Leadership Institute student
Summer Program Course Types

Three types of courses are offered in the Summer Program. Each serves a unique educational purpose and has different eligibility requirements.

Enrichment Courses (Spark, Solstice, Civic Leadership Institute):
Enrichment courses allow students to study a topic with depth and breadth. Course content is advanced and complex, but not presented at an accelerated pace.

Enrichment Intensive Courses (Apogee, Spectrum):
Enrichment intensive courses dive deeply into advanced content, similar to enrichment courses, but the content is presented at a faster pace, often covering a semester or year’s worth of material in a compacted format, resulting in accelerated learning.

Credit Intensive Courses (Apogee, Spectrum, Equinox):
Credit intensive courses are rigorous, high school honors and Advanced Placement® courses taught at a fast pace. The courses allow students to access advanced coursework earlier than is typical in schools. Instructors compact a semester or year’s worth of curriculum into a shorter time frame.

Course Eligibility

All course types have specific eligibility requirements.

The preferred documentation for all course types is an above-grade-level test score taken in a Talent Search program such as Northwestern University’s Midwest Academic Talent Search (NUMATS). Examples include the following:

- Results of an EXPLORE® test taken in grades 3, 4, 5 or 6
- Results of an ACT® or SAT® test taken in grades 6, 7, 8 or 9

Above-grade-level tests provide a more accurate picture of students’ academic needs and readiness for advanced coursework than grade-level assessments. For more information on above-grade-level testing, visit www.ctd.northwestern.edu/numats. Spring testing dates are available.

Students applying for Enrichment and Enrichment Intensive courses may submit scores from a nationally normed, standardized grade-level assessment.

NOTE: When submitting test scores for admission to any course, the test must have been taken within the last two years.

Enrichment Course Test Score Requirements
(All Solstice Courses, Civic Leadership Institute)

- Participation in above-grade-level EXPLORE®, ACT® or SAT® testing: No specific scores, but program staff reserves the right to request additional information to make an admission decision OR
- Nationally normed, grade level achievement test (e.g., ISAT, MAP, ITBS, etc.):
  - English & Language Arts, Social Science & Humanities, or Business & Entrepreneurship courses: 90th percentile or above in verbal or reading subtest.
  - Mathematics courses: 90th percentile or above in quantitative or math subtest.
  - Science, Computer Science & Technology, Design & Engineering courses: 90th percentile or above, subtest requirements vary.

Enrichment Intensive Test Score Requirements
(Most Apogee Courses, Some Spectrum Courses)

- Above-grade-level testing:
  - EXPLORE® test taken in grade 5 or 6, see course descriptions for specific score requirements.
  - SAT® or ACT® test taken in grade 6, 7, 8 or 9, see course descriptions for specific score requirements.
- Nationally normed, grade level achievement test:
  - English & Language Arts, Social Science & Humanities, or Business & Entrepreneurship courses: 95th percentile or above in verbal or reading subtest.
  - Mathematics courses: 95th percentile or above in quantitative or math subtest.
  - Science, Computer Science & Technology, Design & Engineering courses: 95th percentile or above, subtest requirements vary.

Credit Intensive Test Score Requirements
(Algebra I and Java in Apogee, Most Spectrum Courses, All Equinox Courses)

- Above-grade-level testing:
  - Apogee & Spectrum Only: EXPLORE® test taken in grade 5 or 6, see course descriptions for specific score requirements.
  - Spectrum & Equinox: ACT® or SAT® test taken in grade 6, 7, 8 or 9, see course descriptions for specific score requirements.

Students without Test Scores

If no requisite test scores are available or scores do not meet the requirements listed in the course description sections, applicants may submit an Admission Portfolio. For details on what to include in a portfolio, see the Admission Portfolio Applicant section on page 47.

English Language Requirements

Because courses are taught in English, test scores are used to assess proficiency. TOEFL (or TOEFL Jr. for grades 4–8) or IELTS scores are required or students for whom English is not the first language. If testing is not available, students should submit a portfolio that includes the following materials:

- English Language Portfolio Form
- Teacher Recommendation completed by an educator who instructs the student in English
- Writing sample or interview

Please contact the Summer Program staff if you would like to be sent information on completing an English Language Portfolio.

Prerequisites

Some courses require that students complete prerequisites in order to qualify for admission. Prerequisites are listed at the beginning of each course description. Students must submit proof of prerequisites (e.g., transcripts, report card, etc.) to be considered for enrollment.
Performance Evaluations, Transcripts & Syllabi

Evaluations
Students in all courses receive a narrative evaluation. The evaluation includes a rubric rating the student’s skills in core areas, comments on the student’s performance in class and recommendations for future study. Evaluations are sent to families via e-mail, usually in late September.

Students in graded courses receive a letter grade and credit-bearing courses include amount of credit earned through Center for Talent Development. For all credit-bearing courses at CTD, a grade of C- or better is considered successful completion. As CTD is accredited through the North Central Association Commission on Accreditation and School Improvement (NCA CASI), students may be able to earn credit at their academic-year school for courses successfully completed through CTD.

NOTE: The acceptance of CTD credit(s) at a student’s academic-year school depends on that school’s institutional policy about the recognition of credit from outside institutions. Students who are interested in pursuing credit for a CTD course at their school should discuss this option with their academic counselor or school administrator before applying to the Summer Program.

Transcripts
Students in enrichment and enrichment intensive courses typically do not require transcripts, since no grades or credit are awarded. Still, students may request that CTD send an official transcript to their school on the program application. Students in credit intensive courses may request that CTD send their evaluation and an official transcript to their school by indicating this on the program application. Additional transcripts (for college applications, scholarships, etc.) may be requested for a fee using the Transcript Request Form, which is available on the Summer Program website.

Syllabi
Students will receive a course syllabus on Opening Day. As syllabi are in development until just prior to the first day or class, most are not available until then. Syllabi for select courses held in 2014 are available on the Summer Program website.

Campus Life
Program Experience
The programs provide learning experiences matched to students’ identified abilities, inspire a love of learning, and offer a community of intellectual peers.

Typical Daily Schedule
(times may be earlier or later depending on the program)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:15 a.m.</td>
<td>Breakfast</td>
</tr>
<tr>
<td>8:15 a.m.</td>
<td>Commuter students arrive/walk to class</td>
</tr>
<tr>
<td>8:30 a.m.</td>
<td>Class starts</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>Lunch</td>
</tr>
<tr>
<td>12:15 p.m.</td>
<td>Class continues</td>
</tr>
<tr>
<td>2:45 p.m.</td>
<td>Class ends/commuter students may depart</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Afternoon activity (commuters encouraged to participate)</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>Commuters picked up from activities</td>
</tr>
<tr>
<td>5:30 p.m.</td>
<td>Dinner (optional for commuters)</td>
</tr>
<tr>
<td>6:30 p.m.</td>
<td>Evening study sessions (commuters invited but not required to participate)</td>
</tr>
<tr>
<td>8:15 p.m.</td>
<td>Evening activity</td>
</tr>
<tr>
<td>10:00 p.m.</td>
<td>Students must be in their own rooms</td>
</tr>
</tbody>
</table>

Activities
Activities are an important part of the experience, and they help provide a healthy balance of work and play. After class students may participate in a variety of afternoon and evening activities (selections vary by program). Favorites include visiting the beach on Lake Michigan, playing Capture the Flag, visiting the University Student Center, participating in Ultimate Frisbee and soccer games, and engaging in various crafts. Quiet time is an option for students who wish to study or relax with friends.

Students in residential programs enjoy a broad range of activities, such as off- and on-campus theater, concerts, movies, museums, dances and talent shows. The learning that occurs outside of class, through casual conversation, study periods, and recreational activities, is just as important as that which occurs in class. For this reason, we require residential students to remain with the Summer Program throughout each session, including weekends and holidays. If you are not comfortable having your child remain in the program over the weekend, enroll him/her as a commuter student. Due to safety and supervision concerns, weekend activities are offered to residential students only.

Instructors
Center for Talent Development selects instructors based on their mastery of subject matter, experience, enthusiasm and the ability to differentiate instruction. CTD instructors are particularly skilled at providing engaging and thought-provoking learning experiences for academically talented students.

Residential Life
For students who prefer to experience a residential living and learning community, the Summer Program provides a residential option in Solstice, Apogee, Spectrum and Equinox at Northwestern University. All Civic Leadership Institute students are required to be residential.
Students reside and eat in university residence halls under the supervision of specially trained residential staff.

Students in Solstice, Apogee, Spectrum and CLI are housed by age and by gender and, when possible, by discipline. Students in Equinox are housed by course (males and females are on the same floor/wing but have separate rooms and bathroom facilities).

A residential coordinator in each program oversees residential life including staff, activities, health and social issues. Residential assistants are assigned to supervise small groups of students.

Commuters

Students who prefer to reside at home may commute. (CLI students may not be commuters.) Commuters may choose to participate in afternoon activities and evening study sessions.

Commuters in grades 4–8 are dropped off and picked up at central locations monitored by CTD staff members. Students may not be dropped off at any location other than the designated drop-off and pick-up points, as they must check in with the Commuter Assistant for safety and attendance purposes. Equinox commuters may be dropped off at a spot convenient to their classroom, take public transportation or drive themselves to campus.

Lunch is provided to commuter students in a university dining hall.

Commuters participating in an evening study session may stay for dinner for a per meal fee (Northwestern site only).

For the convenience of its commuter students, CTD provides a carpool list for those who request to be included on it. Please indicate your interest in being placed on this list by checking the carpool list box on the Summer Program Application.

Computers

Residential students in Apogee are encouraged to bring their own laptops or tablets with them to assist with their coursework. Some Apogee courses require students to bring a computer. Check course descriptions for details.

Students in Spectrum and Equinox are required to bring a laptop or tablet with word processing software and the ability to connect to the Internet. Courses in these programs make frequent use of technology. A portable printer is helpful for students in writing and humanities courses. Some courses require a laptop (instead of a tablet). See course descriptions for details.

Civic Leadership Institute students are not required to bring a tablet or laptop.

Because of the short duration of our programs, neither CTD nor Northwestern University provides technical support, including e-mail or Internet accounts, for personal computers. Students are given access to the Northwestern Guest wireless network on campus after arrival and orientation.

2015 Summer Program Fees & Application Procedure (Grade 4–12 Programs)

All applicants are encouraged to apply early, as courses typically begin to fill and close as early as mid-March. Complete applications are reviewed as they are received starting January 15. Courses are filled on a first-come, first-served basis.

The Summer Program online application is available on the Summer Program website at www.ctd.northwestern.edu/summer. Applications submitted on or before April 15, 2015 will be charged the Early Application rate. Applications submitted after April 15, 2015 will be charged the Regular Application rate. Note that applications close on June 8, 2015, which is also the withdrawal deadline for full fee refunds (minus the withdrawal processing fee). Although CTD tries to accommodate late applications, enrollment may not be possible. Please be sure to complete the application online, including all supporting materials, as applications are reviewed only after all supporting documents and information has been received. As of June 8, 2015, applications that remain incomplete will be deemed inactive, will not be reviewed and no follow up contact will be made.

NOTES:

- Applications are completed online or by requesting that a paper application be sent to you.
- If you have questions, please e-mail Summer Program staff directly: summer@ctd.northwestern.edu.

Application Review Process

Once the Summer Program office receives a completed application (which means all supporting materials have been received), it is forwarded to the appropriate Program Coordinator for review. Once an enrollment decision is made, the program coordinator will notify the applicant via e-mail using the primary e-mail address provided in the application. The process takes approximately four weeks from the time a completed application is received. Incomplete applications are not reviewed nor do they “hold a spot” in the desired course. Due to the volume of applications, the review process may take longer in April, May and June.

Course Availability

Complete applications are reviewed in the order received. A course listed as available on the website at the time an application is submitted may be filled before that application is processed due to the queue of applications awaiting processing.

Program Fees (Per Session)

<table>
<thead>
<tr>
<th>Solstice (2-week program)</th>
<th>EARLY APPLICATION TUITION RATE</th>
<th>REGULAR APPLICATION TUITION RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuter Student</td>
<td>$1,475</td>
<td>$1,575</td>
</tr>
<tr>
<td>Residential Student</td>
<td>$2,550</td>
<td>$2,650</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Apogee (3-week program)</th>
<th>EARLY APPLICATION TUITION RATE</th>
<th>REGULAR APPLICATION TUITION RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuter Student</td>
<td>$2,115</td>
<td>$2,215</td>
</tr>
<tr>
<td>Residential Student</td>
<td>$3,650</td>
<td>$3,750</td>
</tr>
</tbody>
</table>

“I felt very at home in the program.”

—2014 Equinox student
Spectrum & Equinox

In addition to standard courses, Spectrum and Equinox offer several unique, cooperative courses with Northwestern University departments and external organizations. Equinox also includes 5-week AP® Science courses. Tuition for these specialized offerings varies by course; see below for details.

Spectrum & Equinox Standard Courses (3-week)

<table>
<thead>
<tr>
<th></th>
<th>EARLY APPLICATION</th>
<th>REGULAR APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuter Student</td>
<td>$2,115</td>
<td>$2,215</td>
</tr>
<tr>
<td>Residential Student</td>
<td>$3,650</td>
<td>$3,750</td>
</tr>
</tbody>
</table>

Spectrum & Equinox Partnership Courses (3-week)

Spectrum: HTML & CSS Intensive; 3D Printing & Product Design, and An Epicure for the Common Kitchen
Equinox: Engineering Design; iOS & Swift Bootcamp; Ruby on Rails; Arduino Microcontrollers; Environmental Engineering: Saving the Planet

<table>
<thead>
<tr>
<th></th>
<th>EARLY APPLICATION</th>
<th>REGULAR APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuter Student</td>
<td>$3,400</td>
<td>$3,500</td>
</tr>
<tr>
<td>Residential Student</td>
<td>$4,900</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

Equinox: AP® Biology & AP® Chemistry, and AP® Physics I (5-week)

<table>
<thead>
<tr>
<th></th>
<th>EARLY APPLICATION</th>
<th>REGULAR APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuter Student</td>
<td>$2,700</td>
<td>$2,800</td>
</tr>
<tr>
<td>Residential Student</td>
<td>$5,200</td>
<td>$5,300</td>
</tr>
</tbody>
</table>

Civic Leadership Institute (3-week)

<table>
<thead>
<tr>
<th></th>
<th>EARLY APPLICATION</th>
<th>REGULAR APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$4,300</td>
<td>$4,400</td>
</tr>
</tbody>
</table>

NOTES:
- Residential fees cover tuition; room and board; books; basic materials; and health center fees.
- Commuter fees include tuition, books, basic materials, and lunch.
- Selected courses carry a lab or materials fee; amounts vary by course (see course descriptions for fee details).
- All applications must be accompanied by a $500 tuition deposit. Payment in full must accompany each application submitted after June 8, 2015.
- Students applying for more than one session must pay tuition deposits for each session.
- Tuition balances must be paid by check, money order or credit card within 30 days of acceptance in the program. For students who receive their program acceptance after June 8, 2015, the final payment is due upon notification of acceptance. Students with an outstanding balance after June 8, 2015, may lose their place in the program. Unless a payment plan has been approved, accounts must be paid in full by Opening Day or students will not be allowed to check in and attend class.

Refunds & Withdrawals

- All requests for tuition refunds and/or withdrawals must be made in writing and either e-mailed or mailed to CTD by June 8, 2015. Check with CTD to confirm receipt of request.
- A $60 withdrawal processing fee will be assessed except in the following cases: all of the student’s course choices are closed or canceled or financial aid is not adequate for participation. Refunds of tuition deposits will be less this fee.
- The tuition deposit is non-refundable after June 8, 2015.
- If a student withdraws in writing between the June 8, 2015 deadline and the start of the program, CTD will refund 50% of the program fees paid, less the deposit and withdrawal fee.
- Students who withdraw after the start of a program receive no refund.
- Students dismissed for disciplinary reasons are not eligible for any refund.
- Refund processing may take eight weeks, starting from the time a written request is received by CTD.

Financial Aid & Scholarships

CTD offers need-based financial aid awarded as requests are received, starting in January. Families are encouraged to apply early as the amount of aid available is limited. The Financial Aid application deadline is April 15, 2015.

- For students enrolling in 3-week program computer technology courses (e.g., Programming in Python, Java, HTML/CSS etc.), two need-based scholarship opportunities exist: the Sandra Dennhardt Scholarship and the Gary Greenberg Scholarship. For information on application procedures visit the financial aid section of the Summer Program website. The application deadline for these scholarship applications is April 15.
- The amount of financial aid awarded varies from partial to full tuition, and awards are based on family income and extenuating circumstances (e.g., loss of job, unforeseen medical expenses, etc.). Most families awarded aid have a total household income of less than $50,000.
- Financial aid is awarded for one program and one session per child.
- To be considered for financial aid, families must complete the Financial Aid Application, available once a family has applied through the online application. All supporting materials (tax information, statement of need, etc.) must be included in the financial aid submission in order for an application for financial aid to be considered.
- The amount of financial aid granted and the balance due are reflected on an invoice included in program acceptance materials. Any outstanding balance must be paid by June 8, 2015, unless arrangements have been made with CTD for a payment plan.

Payment Plan

A five-month payment plan is available. To apply, you must submit the payment plan application form available on our website. The payment plan application is due within 30 days of receiving your acceptance notification or by April 15, whichever comes first. The fee for using the payment plan is $50. Families that are eligible for financial aid will not be assessed the service charge for using the payment plan.
International Applicants

The CTD Summer Program has been identified by the Student and Exchange Visitor Program (SEVP) and Northwestern University as an academic program that requires a student visa for any non-U.S. citizen/permanent resident. Any admitted student who is not a U.S. citizen, U.S. permanent resident or in another visa category that allows for study requires sponsorship for a student visa. Failure to comply may negatively impact a student’s ability to secure another non-immigrant visa in the future.

If English is not your child’s primary language, submit TOEFL, TOEFL Jr., or IELTS scores. Students need a good command of written and spoken English to succeed in the fast-paced, intensive courses. For information about TOEFL or TOEFL Jr. tests, contact TOEFL/TSE services at www.ets.org. For information about IELTS, contact IELTS services at www.ielts.org. If testing is not possible, students are required to submit an English Language Portfolio, consisting of the following:

• English Language Portfolio form
• Teacher recommendation form completed by an educator who instructs the student in English
• Recorded speaking sample or Skype interview

Please contact the Summer Program staff if you would like to be sent information on completing an English Language Portfolio.

Visa & Passport Requirements

• Non-U.S. citizens are required to have the appropriate student visa (for more information visit www.travel.state.gov/visa/temp/types/types_1268.html).
• All non-U.S. citizens are required to have a passport to attend summer programs in the U.S. The passport must be valid for a minimum of six months after the completion of the program. Accepted students who require visa sponsorship may incur additional fees to cover processing and mailing costs. Invoices for additional fees will be sent via e-mail to families and payment is due upon receipt.
• Accepted students must report to the Northwestern University International Office with their visa paperwork and passport to complete check-in paperwork.

Getting Started: Applicant Types

You may apply online at www.ctd.northwestern.edu/summer or contact the CTD Summer Program office to request an application form be sent to you.

NOTE: CTD’s Summer Program does not accept faxed applications.

To begin the application process, select the applicant type best suited to you based on the descriptions below.

New Applicant or New Scores

You must meet any one of the following three criteria.

• You have never attended a Center for Talent Development (CTD) program and you have qualifying test scores. (Spectrum and Equinox require above-grade-level test scores: EXPLORE® taken in grade 5 or 6 or SAT® or ACT® taken in grades 6, 7, 8 or 9.)
• You have previously completed a CTD course of the same type (e.g., enrichment, credit intensive, etc.), but you are now applying for a course in a subject area different than the course you successfully completed and you have qualifying test scores.
• You have previously attended a CTD program, but you are applying for a course with more selective admission criteria (i.e., credit intensive course) and you have the requisite test scores.

Recent Participant

You must meet the following criterion.

• Within the past two years, you have successfully completed a CTD course of the same course type and with the same admission criteria as the one for which you are applying.

Admission Portfolio Applicant:

You must meet the following criterion.

• You do not have qualifying test scores because either you have (1) never taken a nationally normed standardized achievement test or, for credit intensive courses in Apogee, Spectrum or Equinox, an above-grade-level test such as the ACT® or SAT® in grades 6 through 9 OR (2) you have taken a nationally normed standardized test, or for Spectrum or Equinox, an above-grade-level test, but have not achieved a qualifying test score.

Application Information

• The tuition deposit ($500) should be made by credit card, check or money order payable to Northwestern University. (If applying after June 8, 2015, you will be required to submit the full, regular tuition fee.) Tuition deposits are required for each session for which the student is applying.
• The admission essay for Spectrum and Equinox (approximately 250 words) must be wholly conceived of and written by the applicant on the topic for the program you selected.
• Prerequisites, if required, are listed in the program pages at the beginning of the course description. Upload proof of prerequisite completion for your first-choice course. Typically, this requirement is fulfilled with a transcript or report card.
• Above-grade-level test scores refer to the EXPLORE® taken in grade 5 or 6 or the ACT® or SAT® taken in grades 6 through 9. Grade-level standardized test scores should be nationally normed tests taken within the last two years (i.e., Terra Nova, ISAT, Iowa Test of Basic Skills, etc.). See page 43 for eligibility requirements.
• The report card or transcript (Spectrum and Equinox) you provide should be the most recent evaluation of your child’s school performance.
• One teacher recommendation is required for Spark and Solstice students, and must be from the current year, primary teacher for the Admission Portfolio. Two teacher recommendations are required for the Admission Portfolio for Apogee, Spectrum and Equinox applicants. At least one recommendation must be from a current year teacher in the subject area of the course you are applying to attend.
• Recommendations should be from teachers who can speak directly to your child’s abilities in the subject area closest to the first-choice course (e.g., the current year science teacher for a chemistry course).
• The link to the online recommendation form is available on the Summer Program website. Applicants are responsible for sending the link to their recommending teachers. Applications to the program are not complete or reviewed until recommendations are complete.
Application Materials Checklist
Use the following charts to determine what materials are required.

Solstice, Apogee or Civic Leadership Institute

<table>
<thead>
<tr>
<th>Application Form</th>
<th>RECENT PARTICIPANT</th>
<th>NEW STUDENT OR NEW SCORES APPLICANT</th>
<th>ADMISSION PORTFOLIO APPLICANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition Deposit</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Statement or Essay</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Proof of Prerequisites (see course description for 1st choice course)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Test Scores</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Report Card</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Teacher Recommendation (two required for Apogee)</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>TOEFL/TOEFL Jr. scores or English language Portfolio*</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* Students whose first language is not English

Spectrum or Equinox

<table>
<thead>
<tr>
<th>Application Form</th>
<th>RECENT PARTICIPANT</th>
<th>NEW STUDENT OR NEW SCORES APPLICANT</th>
<th>ADMISSION PORTFOLIO APPLICANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition Deposit</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Statement &amp; Essay</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Copy of Above-Grade-Level Test Scores (EXPLORE®, ACT® or SAT®)</td>
<td>X</td>
<td>X</td>
<td>X (if available)</td>
</tr>
<tr>
<td>Copy of Grade-Level Standardized Test Scores</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Transcript (unofficial or official)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Proof of Prerequisites (see course descriptions for 1st choice course)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Two Teacher Recommendations</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>TOEFL/TOEFL Jr. scores or English language Portfolio*</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* Students whose first language is not English

Essay Questions
All Spectrum, Equinox and Civic Week Institute students are required to submit an essay (approximately 250 words) conceived and written by the applicant.

Spectrum Essay Topic:
“None of us is as smart as all of us.”—Ken Blanchard

Describe a time when you had to compromise and negotiate in order to do a great job on a task with a difficult partner or group. What did you learn from that experience?

Equinox Essay Topic:
“It is easy to pretend that nobody can change anything, that we are in a world in which society is huge and the individual is less than nothing: an atom in a wall, a grain of rice in a rice field. But the truth is, individuals change the world over and over, individuals make the future, and they do it by imagining that things can be different.”—Neil Gaiman

Describe a time when you wanted something significant to change in your life or in your world. What was it? What efforts did you undertake to change and why? What did you learn from the experience?

Civic Leadership Institute Essay Topic:
CLI is a service-learning program focused on social issues, leadership and civic engagement. What do you hope to gain from your participation in CLI?
Center for Talent Development, Northwestern University
Dynamic Pathways for Gifted Learners

Center for Talent Development (CTD) at Northwestern University is dedicated to helping gifted students, age 4 through grade 12, reach full potential. We provide research-based assessment, advanced programs and resources to enhance a child’s schooling. Our signature approach to talent development delivers personalized options and guidance for young people with high ability. Program pathways lead students on a journey of intellectual, emotional and social growth. By extending support to families and educators, we help exceptional students discover their unique voice, explore opportunities, cultivate a love of learning and become bold, creative achievers and contributors.

Special Event for Families: Opportunities for the Future Family Conference
CTD hosts a family conference just prior to the start of the Summer Program. It offers parents the chance to learn from experts in gifted education about talent development, social and emotional issues and educational options. Students in grades 4 through 12 attend workshops on their favorite subjects and explore career paths.

Date, Time & Location: Saturday, June 27 from 1 to 5 p.m. on Northwestern University’s Evanston campus.

All details, including speakers, workshop sessions and fees will be posted on the CTD website in January: www.ctd.northwestern.edu

Northwestern University’s Midwest Academic Talent Search (NUMATS)
The foundation for a lifelong journey of achievement and fulfillment. Research-based assessments identify exceptional academic ability and connect students to tailored programs and opportunities. Parents and educators gain invaluable information to create challenging, dynamic pathways that nurture individual potential.

Gifted LearningLinks
Individualized pathways through online learning that expand access to advanced subject matter and foster personal interests. Motivated students progress at the time, place and pace right for them and enjoy one-on-one engagement with instructors.

Weekend Enrichment Programs
Weekend opportunities for discovery that allow gifted students to focus their curiosity and passion on a specific interest area. A wide variety of advanced and unique courses range in duration from a single weekend to eight consecutive Saturdays.

Civic Education Project
Pathway to leadership and civic engagement that combines service-learning with academic study and reflection. Bright, impassioned students engage in social issues first-hand and develop skills to change the world.

National Association For Gifted Children
The National Association for Gifted Children (NAGC) is an organization of parents, teachers, administrators, other professionals and community leaders addressing the unique needs of children and youth with demonstrated gifts and talents as well as those children who may be able to develop their talent potential with appropriate educational experiences. Visit the NAGC website to join this organization and add your name to the ranks of supporters working to raise awareness of the needs of gifted learners nationwide. Learn more at www.nagc.org.

Students associated with Center for Talent Development are held to all responsibilities of members of the Northwestern University community. Northwestern University and Center for Talent Development reserve the right to change without notice any statement in this brochure concerning, but not limited to, rules, policies, tuition, fees, courses, and faculty. Northwestern University does not discriminate or permit discrimination by any member of its community against any individual on the basis of race, color, religion, national origin, sex, pregnancy, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship, veteran status, genetic information, or any other classification protected by law in matters of admissions, employment, housing, or services or in the educational programs or activities it operates.

For advice or assistance regarding this policy, contact the Office of Equal Opportunity and Access, 720 University Place, Evanston, Illinois 60208-1145. Phone: 847/491-7458.
Center for Talent Development
Northwestern University.

Summer Program
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e-mail  summer@ctd.northwestern.edu
web    www.ctd.northwestern.edu/summer

Center for Talent Development
2015 Summer Program
For academically gifted students age 4–grade 12