



ChiS&E

Chicago
Pre-College
Science and
Engineering
Program

Fall Parent & Student Orientation & Registration (2023)

<https://chiprep.org>

Saturday, September 16, 2023

9:00 a.m. – 12:00 p.m.

Kenneth Hill, CEO & President ChiS&E

Agenda



- ★ **Welcome | Kenneth Hill, CEO & President ChiS&E**
ChiS&E Updates
- ★ **Special Message for ChiS&E Students – Mayor Brandon Johnson**
- ★ **Special Boeing Presentation**
- ★ **ChiS&E Fall Curriculum Overview**
- ★ **6th Grade New Course “Fundamentals of Algebra” 6th Grade Student Pre-Test**
- ★ **ChiS&E Registration Process**
- ★ **Breakout Sessions by grade level**
Fall Schedule Overview
Curriculum Overview
Registration
- ★ **Q & A**

Guest Speaker Introduction



Mayor, Brandon Johnson

Special Message for ChiS&E Students and Families



Boeing Special Presentation



ChiS&E Fall 2023 Program Overview

- ★ ChiS&E Program Overview
- ★ ChiS&E Fall 2023 Courses
- ★ ChiS&E Fall 2023 Class Schedule
- ★ ChiS&E Staff Introductions
- ★ Registration Process

Chicago Pre-College Science & Engineering Program (ChiS&E)

The Chicago Pre-College Science and Engineering Program (ChiS&E) provides highly-engaging, age-appropriate hands-on science and engineering activities for Chicago Public School (CPS) K-12 students and their parents. The program develops student and parent knowledge as well as a love of learning in areas of science, technology, engineering and mathematics.



Chicago Pre-College Science & Engineering Program Goals

- To raise **community awareness** about the importance of student success in science and mathematics.
- To illuminate **pathways to careers** in science, technology, engineering and math (STEM) professions.
- To **inspire passion for science and math** through hands-on activities that make engineering come alive.
- To **equip parents** to provide supportive STEM-related learning experiences for their children.
- To **highlight professional role models** within the African American and Latino engineering community.



Our Goal

To prepare our students to be:

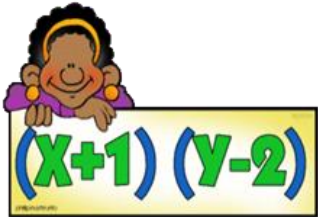
- Algebra Ready by Grade 8
- Calculus ready by High School



$$? a^2 + b^2 = c^2 ?$$
$$y = mx + b \quad ? \quad d = rt$$

Why Algebra & Calculus?

- ★ ACT connection
- ★ Algebra is present on math placement exams for college
- ★ Calculus is necessary for Engineering and science degrees



Our Strategy

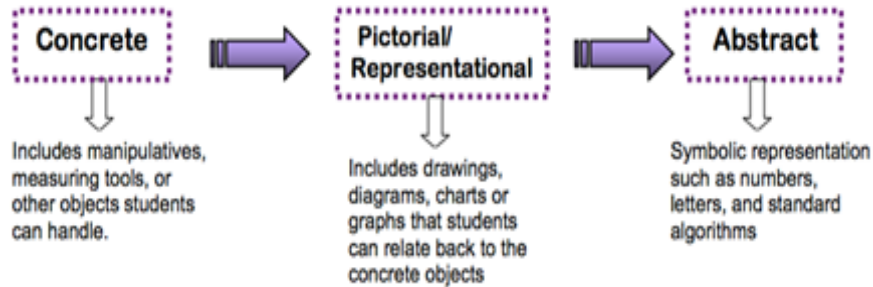


Image credit: © 2015 HSD Mathematics.

This STEM Algebra integration curriculum provides learning opportunities for students in Kindergarten through grade 3:

- Utilize math thinking tools
- describe their thinking,
- document their solution steps,
- provide rationales for their solution approaches.
- **extensive partner work** between **students and their parents** is implemented to facilitate cognitive stimulation and growth.



How do we do it?

- ★ Provide hands-on, **activity-based instruction** in science and engineering to parents and students in Grades K-5.
- ★ Create and inspire in both student and parent a **quest for math, science and technology education** and experiences beyond the K-3 grade levels.
- ★ **Expose** parents and students to science and engineering facilities in their communities via field trips and instructional classes in these locations
- ★ Provide parents and students opportunities to meet African American, Latino, and other **scientists and engineers**.
- ★ **Provide teacher training** for elementary school teachers who will teach the K-12 pre-engineering curriculum to parents and students



Location of (in person) STEM Sessions

K – 3:

Bronzeville Children’s Museum
Museum of Science and Industry
Langston Hughes STEM School



4 – 6:

Ida B. Wells Preparatory



7 – 12:

Kenwood Academy High School
University of Illinois at Urbana-Champaign (UIUC)

Engineering Curriculum Pathway



- K – Little Civil Engineer (+ Algebra Concepts)
- 1st – Little Chemical Engineer (+ Algebra Concepts)
- 2nd – Little Electrical Engineer (+ Algebra Concepts)
- 3rd – Little Mechanical Engineer (+ Algebra Concepts)
- 4th – Little Structural Engineer (bridge building)
- 5th – 7th Young Aerospace Engineers (Rockets & Drones) *Summer Series*
- 5th – Young Mathematicians (geometry)
- 6th – Fundamentals of Algebra
- 7th – Young Physicist's (physics & algebra)
- 8th – Young Computer Scientists (Computer Coding & Robotics)
- 9th & 10th – Algebra Topics for Calculus
- 11th & 12th - Electrical Engineering & Robotics
- 6th – 8th Summer Enrichment (Algebra, Engineering, and Computer Science)
- 9th – 11th Math Boot Camp @ University of Notre Dame

Expectations for Participation

Class begins promptly at 9:00 a.m. and will end on time at 12:30 p.m.

→ Requirements for participation

Student/Parent Symposium
Activity Based
“Side By Side Learning”
Grade K-5

Students & Parents will need to:

- Attend all scheduled sessions
- Participate fully in all classroom sessions
- Complete homework activities
- Submit student exit slips and parent surveys.



Parent Engagement (Side By Side Learning)

- As co-learners with their children, parents are critical to the success of the program.
- Parents attend two orientation sessions to better understand their multi-year commitment to participate in the program.
- Parent training is designed to enhance their science and technology awareness alongside their children.
- Using digital technology, parents document their experiences and share them with students' classrooms and with their families and communities.
- In addition, the family support team, made up of professionals from the fields of psychology, counseling, and social work, provide parent training and support.



University Partnerships



UNIVERSITY OF
ILLINOIS
URBANA - CHAMPAIGN



**Grainger College
of Engineering**

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN



THE UNIVERSITY OF
CHICAGO



DISCOVERY
PARTNERS
INSTITUTE

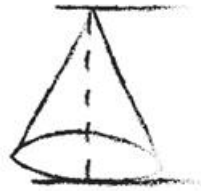
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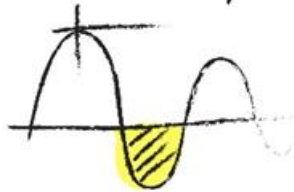
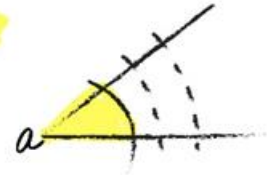
Grade 6 Fundamentals of Algebra

$$\begin{aligned}2x + y - 4 &= x - 2 \\2x + y &= x + 2 \\2x &= x + 2 - y \\x &= 2 - y\end{aligned}$$

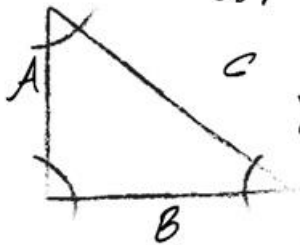


$$\frac{\sin}{\cos} = -90 < x < 90$$

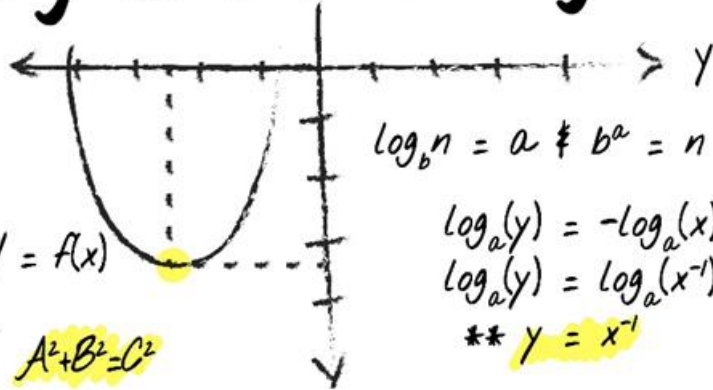
$$\sin(-a) = -\sin a$$



$$\begin{aligned}y &= b^x \\x &= \log_b y\end{aligned}$$



ALGEBRA



$$\log_b n = a \neq b^a = n$$

$$\log_a(y) = -\log_a(x)$$

$$\log_a(y) = \log_a(x^{-1})$$

$$** y = x^{-1}$$

$$(12-a) * (4+b) = 20$$

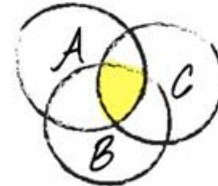
$$12-a = \frac{20}{(4+b)}$$

$$(4+b)$$

$$12-a = \frac{5}{b}$$

$$12b - ab = 5$$

$$12b = 5 - ab$$



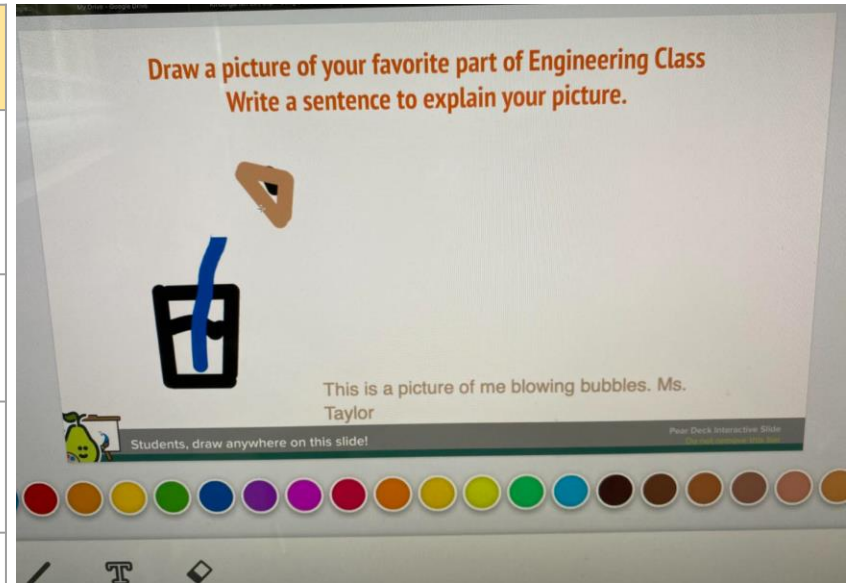
Primary Classes Grades Kindergarten through Grade 3



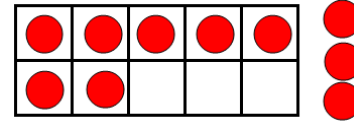
ChiS&E Class Schedule

Grades K - 3

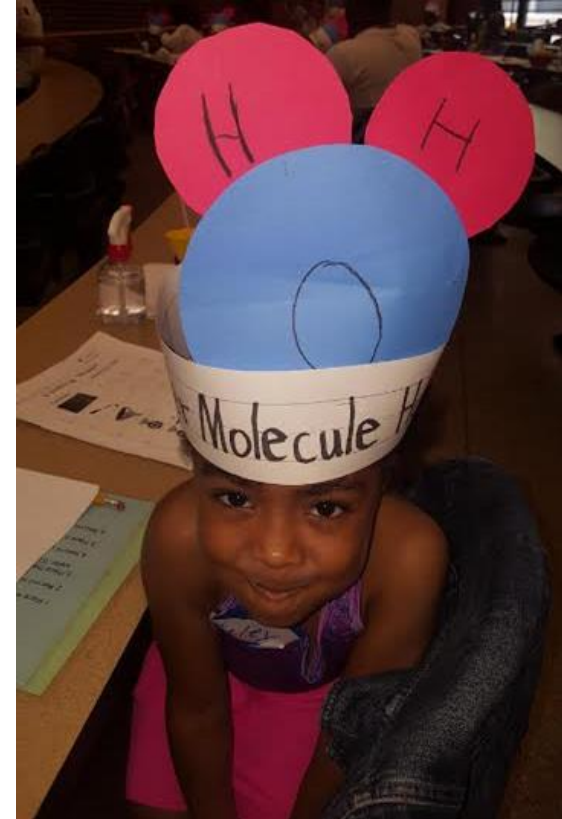
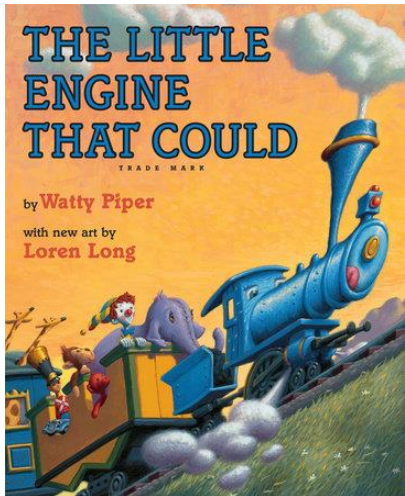
Time	Class
9:00 a.m. - 10:30 a.m.	Science & Engineering
10:30 a.m - 10:45 a.m.	Break
10:45 p.m. - 12:20 p.m.	Algebra
12:20 p.m. - 12:30 p.m.	Student Exit Slips & Parent Evaluations



Kindergarten- “Little Civil Engineers”



- ★ Introduction to the Engineering Design Process
- ★ Literature “The Little Engine that Could”
- ★ Exploring water concepts through hands on minds on investigations
- ★ Ten-Frame Math Thinking Tool



First Grade “Little Chemical Engineers”

Chemical changes involve changing a substance into another substance. Clues to look for when a chemical change has occurred:

- Color changes
- New substance forms
- Heat or light is given off
- Bubbles form



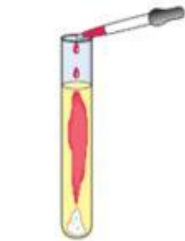
A new colour appears.



Heat, light, or sound is given off (or absorbed).



Bubbles of gas are formed. A new odour may be noticed.



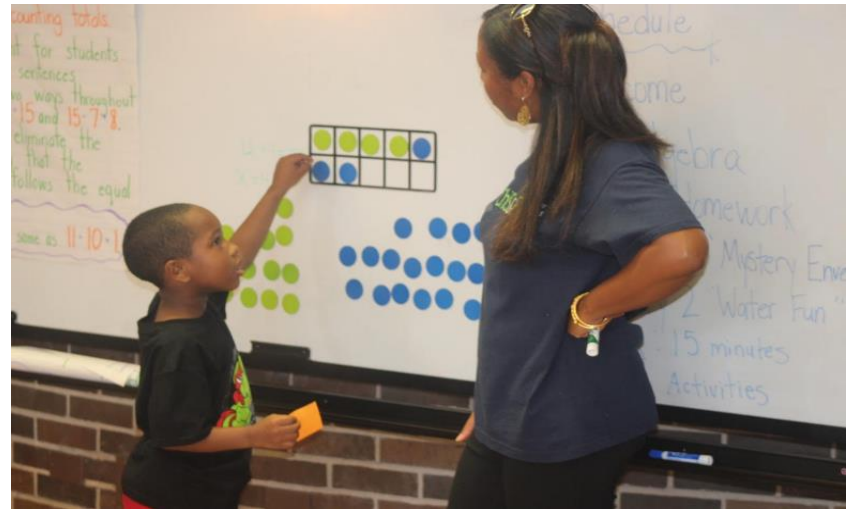
A solid material (called a precipitate) forms in a liquid.



The change is difficult or impossible to reverse.

Algebra Skills & Math Thinking Tools

- Ten-Frame
- Cuisenaire Rods
- Pattern Blocks
- Solving for **Unknown** Numbers

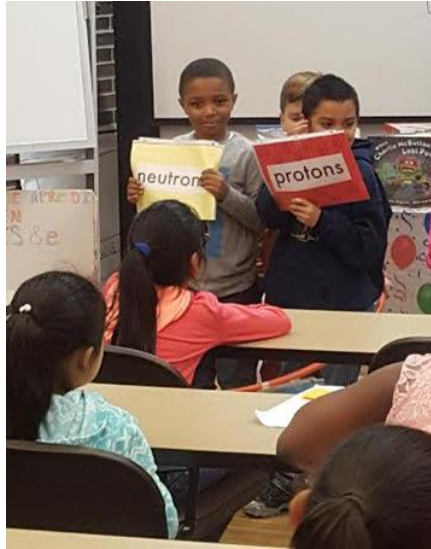


Second Grade “ Little Electrical Engineers”

- ❑ Exploring electricity concepts.
- ❑ Building simple circuits
- ❑ Using the Engineering Design Process

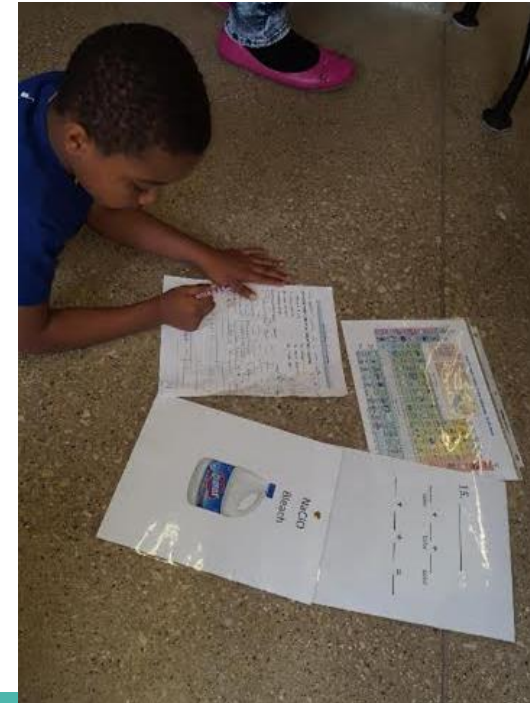
Algebra Skills & Math Thinking Tools

- ❑ Introduce Multiplication & division
- ❑ Integrate the Periodic Table of Elements
- ❑ Provide Problem Solving Strategies



The Periodic Table of the Elements, in Pictures

Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
1	H	Li	Na	K	Rb	Cs	Fr													
2		Be	Mg	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
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Third Grade “Little Mechanical Engineers”

- Exploring simple machines
- Using the Engineering Design Process to develop their own original invention.



Simple Machines



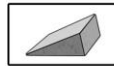
Wedge



Wheel and Axle



Lever



Inclined Plane

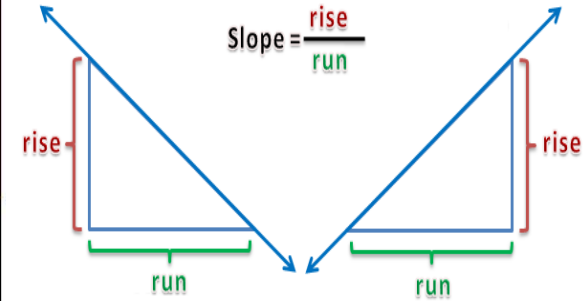
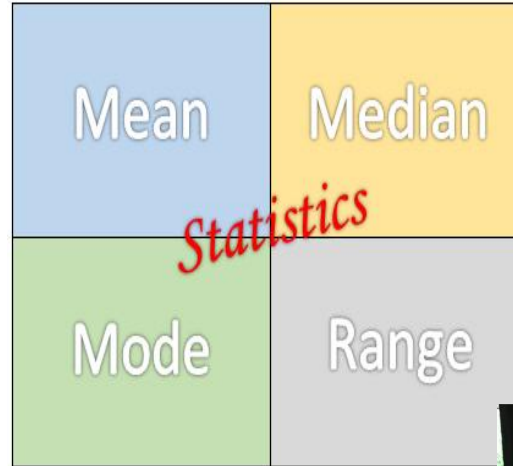


Screw



Pulley

Algebra Skills: Statistics & Slope



Class Schedule (Kindergarten) **SAVE THE DATES!**

Kindergarten

****Parents are required to attend each class session.****

(Bronzeville Children's Museum 9301 S Stony Is Ave, Chicago, IL 60617)

Class session #1 - Saturday, May 18, 2024, 9:00 a.m. – 12:30 p.m.

Class session #2 - Saturday, June 1, 2024, 9:00 a.m. – 12:30 p.m.

Class session #3 - Saturday, June 8, 2024, 9:00 a.m. – 12:30 p.m.

Class Session #4 - Saturday, June 15, 2023, 9:00 a.m. – 12:30 p.m.
(Field Trip: Museum of Science & Industry)

Fall Class Schedule (Grades 1-3) **SAVE THE DATES!**

Grades 1-3

****Parents are required to attend each class session.****

(Langston Hughes STEM School 240 West 104th Street, Chicago, IL 60628)

Class session #1 - Saturday, October 7, 2023 9:00 a.m. – 12:30 p.m.

Class session #2 - Saturday, October 14, 2023 9:00 a.m. – 1:30 p.m.

(Field Trip: Museum of Science & Industry)

Class session #3 - Saturday, October 21, 2023 9:00 a.m. – 12:30 p.m.

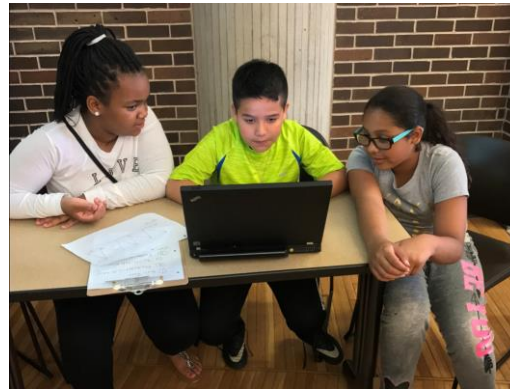
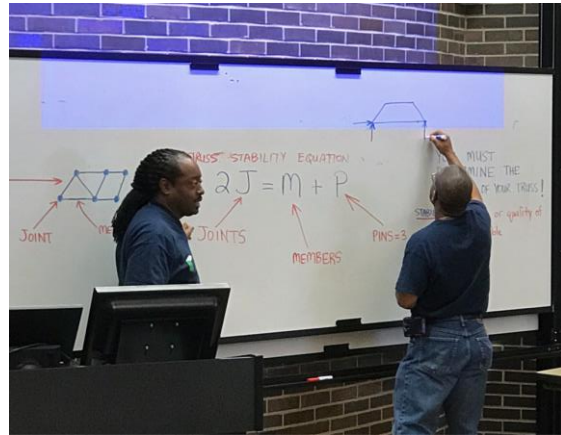
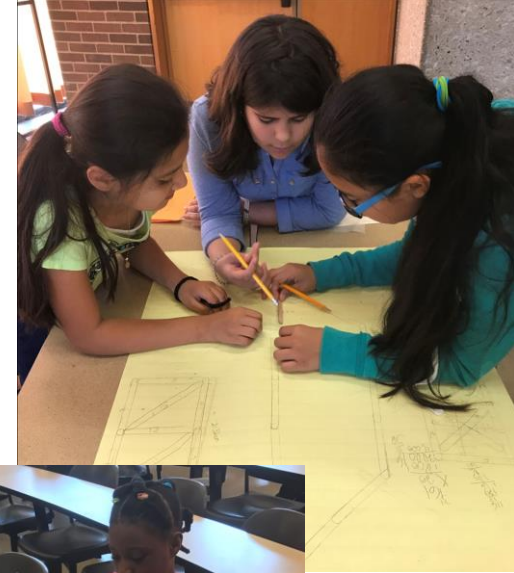
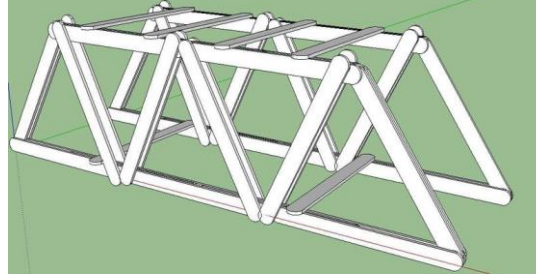
Class Session #4 - Saturday, October 28, 2023 9:00 a.m. – 12:30 p.m.

Intermediate Grades 4-6



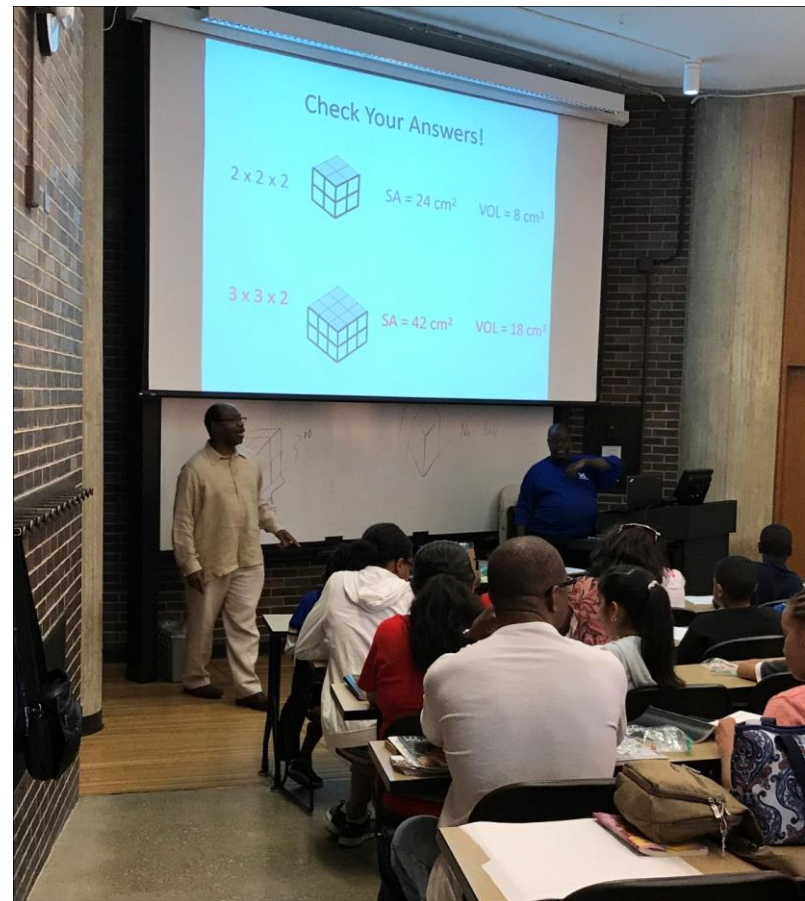
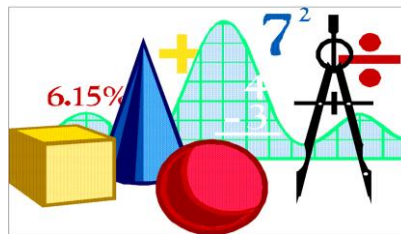
Grade 4 “Little Structural Engineers”

- ❑ Popsicle Bridge Building
- ❑ West Point Bridge Design
- ❑ Working in engineering teams
- ❑ Maintain a budget



Grades 5 Young Mathematicians “Geometry”

- ❑ Hands on Minds on Activities
- ❑ Parents as partners



Fall Class Schedule (Grade 4) **SAVE THE DATE!**



Grade 4

"Little Structural Engineers" ****Parents are required to attend the first class session.****

(Ida B. Wells Preparatory 249 E 37th St, Chicago, IL 60653)

Class session #1 - Saturday, November 4, 2023, 9:00 a.m. – 12:30 p.m.

Class session #2 - Saturday, November 11, 2023, 9:00 a.m. – 12:30 p.m.

Class session #3 - Saturday, November 18, 2023, 9:00 a.m. – 12:30 p.m.

Class session #4 - Saturday, December 2, 2023, 9:00 a.m. – 12:30 p.m.

Fall Class Schedule (Grades 5) **SAVE THE DATE!**

Grades 5 (Geometry)

****Parents are required to attend the ALL class sessions.****

(Ida B. Wells Preparatory 249 E 37th St, Chicago, IL 60653)

Class session #1 - Saturday, November 4, 2023, 9:00 a.m. – 12:30 p.m.

Class session #2 - Saturday, November 11, 2023, 9:00 a.m. – 12:30 p.m.

Class session #3 - Saturday, November 18, 2023, 9:00 a.m. – 12:30 p.m.

Class session #4 - Saturday, December 2, 2023, 9:00 a.m. – 12:30 p.m.

Fall Class Schedule (Grade 6) **SAVE THE DATE!**

Grade 6 (Fundamentals of Algebra)

(Ida B. Wells Preparatory 249 E 37th St, Chicago, IL 60653)

Class session #1 - Saturday, September 30, 2023, 9:00 a.m. – 12:30 p.m.

Class session #2 - Saturday, October 7, 2023 9:00 a.m. – 12:30 p.m.

Class session #3 - Saturday, October 14, 2023 9:00 a.m. – 12:30 p.m.

Class session #4 - Saturday, October 21, 2023 9:00 a.m. – 12:30 p.m.

Class Session #5 - Saturday, October 28, 2023 9:00 a.m. – 12:30 p.m.

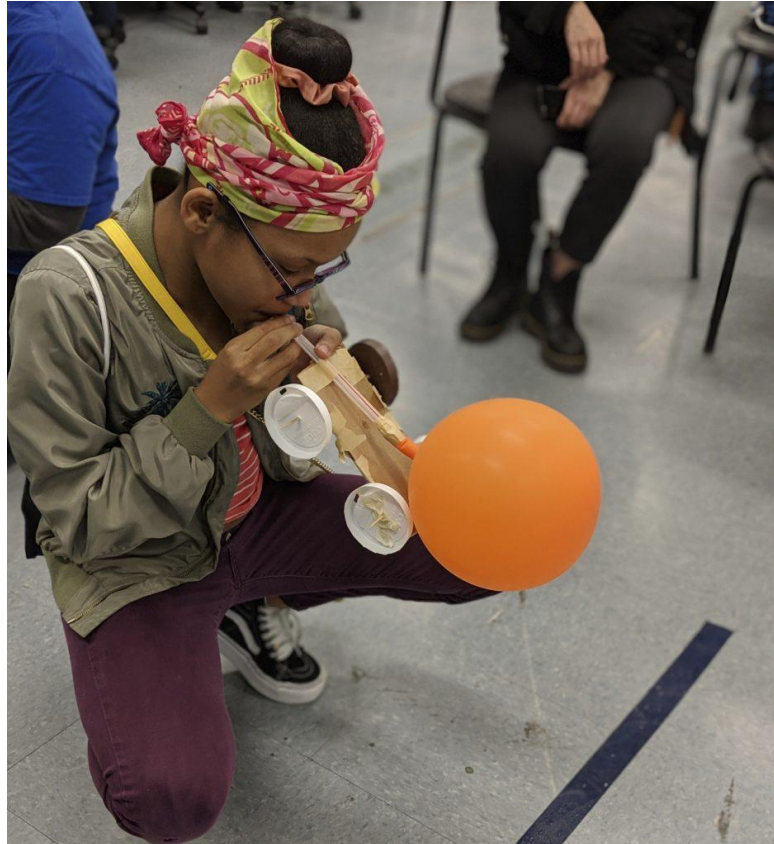
Class session #6 - Saturday, November 4, 2023, 9:00 a.m. – 12:30 p.m.

Class session #7 - Saturday, November 11, 2023, 9:00 a.m. – 12:30 p.m.

Class session #8 - Saturday, November 18, 2023, 9:00 a.m. – 12:30 p.m.

Class session #9 - Saturday, December 2, 2023, 9:00 a.m. – 12:30 p.m.

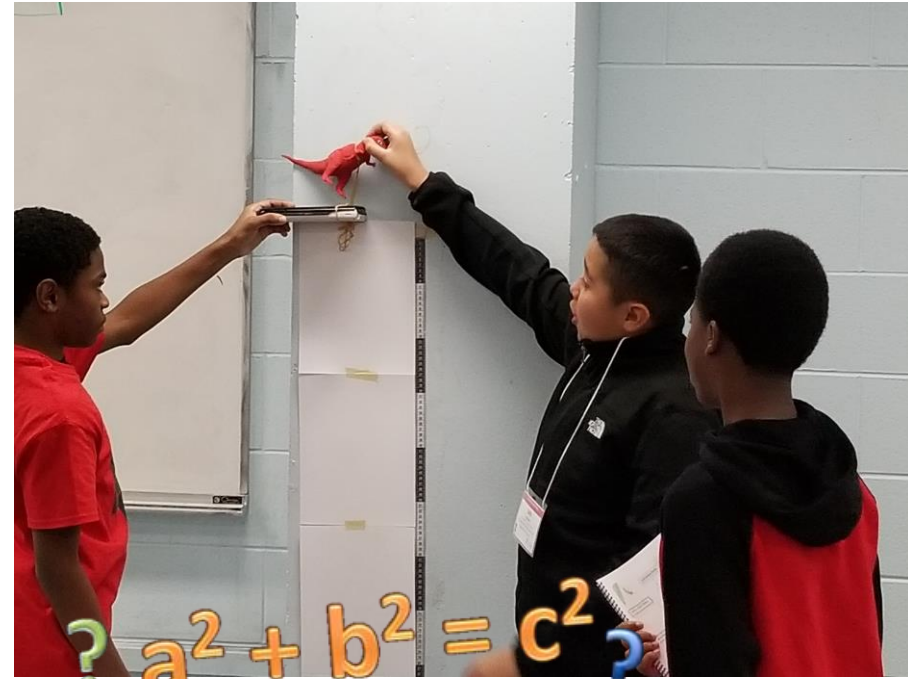
Middle School Grades 7 & 8



Grade 7 “Young Physicist’s” & Algebra

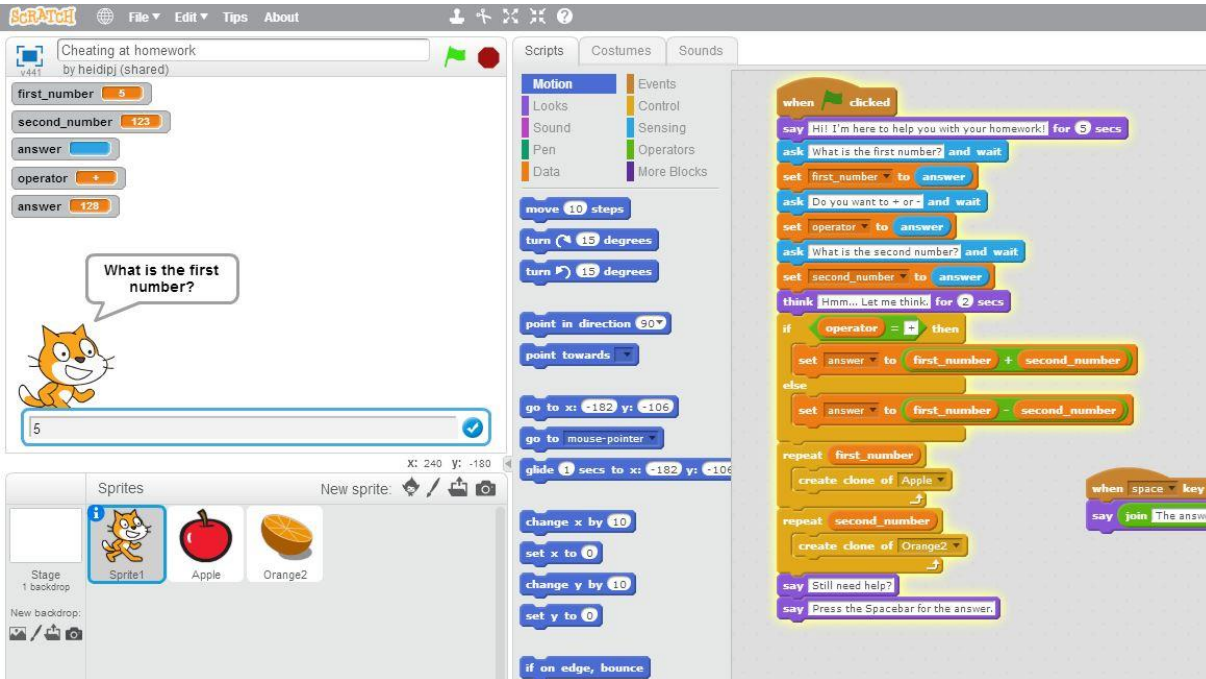
Algebra as a language for physics

- ❑ Real world connections
- ❑ Intro to graphing calculators
- ❑ Physics data collection and analysis
- ❑ Intro to Y intercept

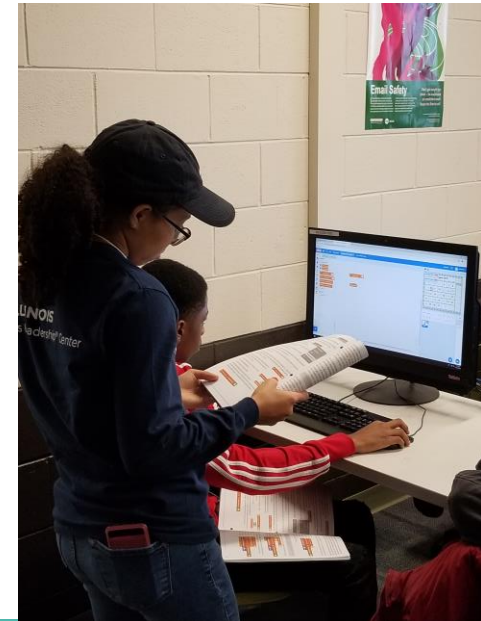


$$a^2 + b^2 = c^2$$
$$y = mx + b$$
$$d = rt$$

Grade 8 “Young Computer Scientist” & Robotics



- Scratch Coding
- Robotics
- University of Illinois teaching assistants



Fall Class Schedule (Grade 7) **SAVE THE DATE!**



7th Grade: Mathematics of the Physical World (Physics and Algebra)

(Kenwood Academy High School 5015 S Blackstone Ave, Chicago, IL 60615)

Class session #1 - Saturday, October 14, 2023, 10:00 a.m.-12:30 p.m.

Class session #2 - Saturday, October 21, 2023, 10:00 a.m.-12:30 p.m.

Class session #3 - Saturday, October 28, 2023, 10:00 a.m.-12:30 p.m.

Class session #4 - Saturday, November 4, 2023, 7:00 a.m.- 5:30 p.m.

Family Field Trip to the University of Illinois, Urbana Champaign

STEM X Event

Fall Class Schedule (Grade 8) **SAVE THE DATE!**



8th Grade: Computer Science with Scratch Programming

(Kenwood Academy High School 5015 S Blackstone Ave, Chicago, IL 60615)

Class session #1 - Saturday, October 14, 2023, 10:00 a.m.-12:30 p.m.

Class session #2 - Saturday, October 21, 2023, 10:00 a.m.-12:30 p.m.

Class session #3 - Saturday, October 28, 2023, 10:00 a.m.-12:30 p.m.

Class session #4 - Saturday, November 4, 2023, 7:00 a.m.- 5:30 p.m.

Family Field Trip to the University of Illinois, Urbana Champaign
STEM X Event

Explore Grainger Engineering

October 6 or November 10

» *Transportation provided from Kenwood Academy*

Full day visit to the University of Illinois for High School Students and Families!

Hear from current students and connect with:

- » *Cultural houses*
- » *Women in Engineering*
- » *Morrill Engineering Program*
- » *Women's Resource Center*
- » *Office of Minority Student Affairs*
- » *Financial Aid & Scholarships*
- » *Engineering Student Groups and Organizations*



Register Here:
go.illinois.edu/explore-grainger



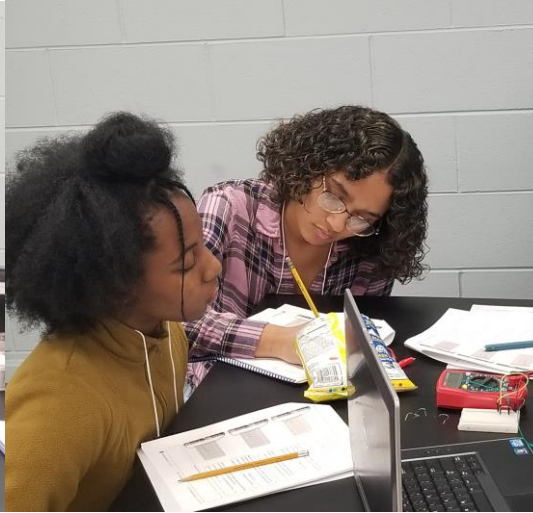
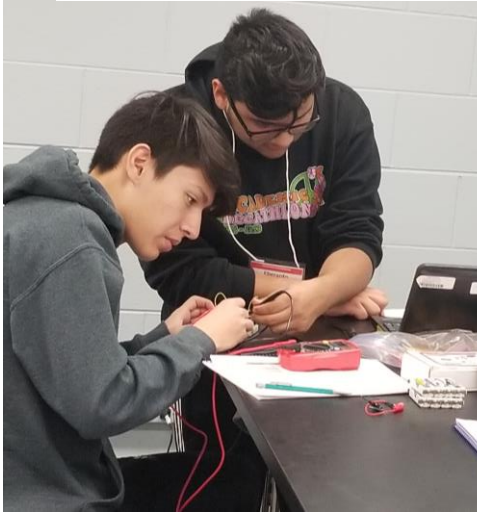
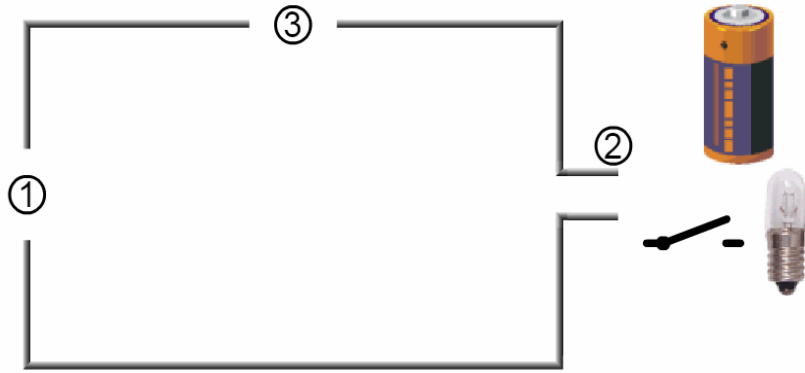
High School Grades 9-12



Grades 9 & 10 “Algebra Topics for Calculus”



Grades 11 & 12 Electrical Engineering & Robotics



Fall Class Schedule (Grades 9 & 10) **SAVE THE DATE!**



Grade 9 & 10 *Algebra Topics for Calculus*

(Kenwood Academy High School 5015 S Blackstone Ave, Chicago, IL 60615)

Class session #1 - Saturday, October 7, 2023 9:00 a.m. – 12:30 p.m.

Class session #2 - Saturday, October 14, 2023 9:00 a.m. – 12:30 p.m.

Class session #3 - Saturday, October 21, 2023 9:00 a.m. – 12:30 p.m.

Class Session #4 - Saturday, October 28, 2023 9:00 a.m. – 12:30 p.m.

Class session #5 - Saturday, November 4, 2023, 9:00 a.m. – 12:30 p.m.

Fall Class Schedule (Grades 11 & 12) **SAVE THE DATE!**



Grades 11 & 12 | Electrical Engineering & Robotics

(Kenwood Academy High School 5015 S Blackstone Ave, Chicago, IL 60615)

Class session #1 - Saturday, October 14, 2023, 10:00 a.m.-12:30 p.m.

Class session #2 - Saturday, October 21, 2023, 10:00 a.m.-12:30 p.m.

Class session #3 - Saturday, October 28, 2023, 10:00 a.m.-12:30 p.m.

Class session #4 - Saturday, November 10, 2023, 7:00 a.m.- 5:30 p.m.

Family Field Trip to the University of Illinois, Urbana Champaign
STEM X Event

ChiS&E Fall Student Showcase

Grades 1-12



Saturday, December 9, 2023

10:00 am – 12:00 pm

Students will share their Fall projects with families.

Families are required to attend.

Summer Enrichment Rising 7th, 8th, & 9th

SAVE THE DATE!

Rising 7th 8th 9th grade

Engineering, Algebra, & Computer Science (Raspberry Pi)

June 24th – July 19th, 2024

9:00 a.m. – 3:00 p.m.

Monday - Friday

Field Trips Every Friday

Grade: Rising 5th-7th (Current 4th – 6th)

“Young Aerospace Engineers”



- NASA Rocketry
- Drone Technology
- Parents as partners



Ingenuity
NASA Helicopter
currently on Mars



Perseverance Rover
currently on Mars



SLS (Space Launch System)
World's most powerful rocket!
Image Credit: NASA



Procedures: "Let's Build the Flyer!"

Build

1. Give each student the materials listed below.

2. Have students work in pairs to create a flyer for the school's upcoming event. They should use the information on the flyer to create a flyer that is both informative and visually appealing.

3. Have students present their flyers to the class and give feedback to each other.

4. Have students work in pairs to create a flyer for the school's upcoming event. They should use the information on the flyer to create a flyer that is both informative and visually appealing.

5. Have students present their flyers to the class and give feedback to each other.

6. Have students work in pairs to create a flyer for the school's upcoming event. They should use the information on the flyer to create a flyer that is both informative and visually appealing.

7. Have students present their flyers to the class and give feedback to each other.

8. Have students work in pairs to create a flyer for the school's upcoming event. They should use the information on the flyer to create a flyer that is both informative and visually appealing.

9. Have students present their flyers to the class and give feedback to each other.

10. Have students work in pairs to create a flyer for the school's upcoming event. They should use the information on the flyer to create a flyer that is both informative and visually appealing.

Summer Series Schedule (Grades 5-7)

SAVE THE DATE!

Grades 5 – 7 (Young Aerospace Engineers)

July 24th – July 28th, 2024

9:00 a.m. – 2:00 p.m.

Field Trip, July 27th Adler Planetarium

More details to come!

Applications open March 2024

ChiS&E Fall 2023- Primary Team - Grades K-3



Subject	Staff
"Little Civil Engineers" Kindergarten Science Instructor	Dr. Maxine Jackson & Angela Clark
"Little Civil Engineers" Kindergarten Algebra Instructor	Dr. Qiana Walker & Marlene Tyler
"Little Chemical Engineers" Gr. 1 Science Instructor	Angela Clark & Antoinette Harth
"Little Chemical Engineers" Gr. 1 Algebra Instructor	Marlene Tyler
"Little Electrical Engineers" Gr. 2 Science Instructor	Resilda Nune & Asucena Lopez
"Little Electrical Engineers" Gr. 2 Algebra Instructor	Dr. Qiana Walker & Dr. Maxine Jackson
"Little Mechanical Engineers" Gr. 3 Science Instructor	Michelle Danielley
"Little Mechanical Engineers" Gr. 3 Algebra Instructor	LaTina Taylor

ChiS&E Fall 2023 -Intermediate Team - Grades 4-6



Subject	Staff
"Little Structural Engineers" Gr. 4 Instructor	LaTina Taylor
"Little Structural Engineers" Gr. 4 Instructor	Melvin Slater
Young Mathematicians- Geometry Gr. 5 Instructor	Jake Navarez
Young Mathematicians- Geometry Gr. 5 Instructor	Marlene Tyler
Young Mathematicians- Geometry Gr. 6 Instructor	Michelle Danielley
Young Mathematicians- Geometry Gr. 6 Instructor	Alonzo Hoskins

ChiS&E Fall 2021 - Middle School Team - Grades 7 & 8



Subject	Staff
7 th Gr. Physics & Algebra Instructor	Soyini Walton
8 th Gr. Computer Science/Scratch Instructor	Damien Edwards

ChiS&E Fall 2023 - High School Team - Grades 9 -12



Subject	Staff
Grades 9 &10 Algebra Topics for Calculus	Sharon Edwards
Grades 9 &10 Algebra Topics for Calculus	Jesse Boyce
Grades 9 & 10 Algebra Topics for Calculus	Willie Straughter
11 th & 12 th Grade Electrical Engineering & Robotics	Kendall Coleman

ChiS&E Fall 2023 Registration

Fall 2023

ChiS&E Registration Link



Chicago Pre-College Science & Engineering Program ([ChiS&E](#)) Fall 2023 Registration

Hello Students, Families, & Friends

Please take a few moments complete the form below to register your child to participate in the [Chicago Pre-College Science & Engineering Program \(ChiS&E\)](#). Fall 2023 STEM programming.

Fall 2023 Class Schedule

Kindergarten - "Little Civil Engineers" (+Algebra Concepts)

****Parents are required to attend each class session.****

Spring 2024

Class session #1 - Saturday, May 18, 2024 9:00 a.m. – 12:30 p.m.

Class session #2 - Saturday, June 1, 2024 9:00 a.m. – 12:30 p.m.

Class session #3 - Saturday, June 8, 2024 9:00 a.m. – 12:30 p.m.

Class session #4 - Saturday, June 15, 2024 9:00 a.m. – 12:30 p.m. (Field Trip: Museum of Science & Industry)

Grade 1 - "Little Chemical Engineers" (+Algebra Concepts)

Grade 2 - "Little Electrical Engineers" (+Algebra Concepts)

Grade 3 - "Little Mechanical Engineers" (+Algebra Concepts)

****Parents are required to attend each class session.****

[\(Langston Hughes STEM Elementary, 240 West 104th Street, Chicago, IL 60628\)](#)

Class session #1 - Saturday, October 7, 2023 9:00 a.m. – 12:30 p.m.

Class session #2 - Saturday, October 14, 2023 9:00 a.m. – 12:30 p.m. (Field Trip: Museum of Science & Industry)

Q & A

