

STEAM

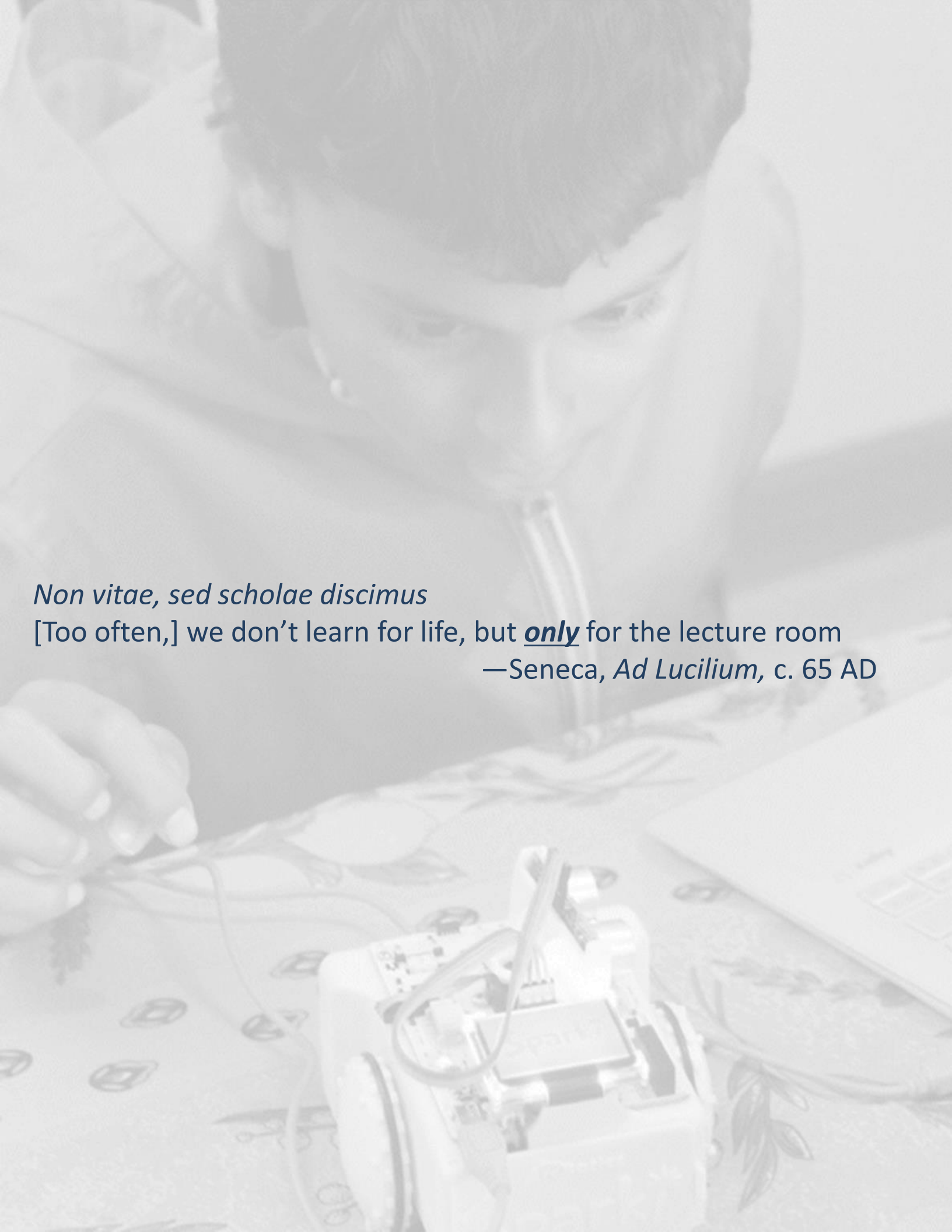
Science | Technology | Engineering | Arts | Math

2018 Winter & Spring Center Catalog



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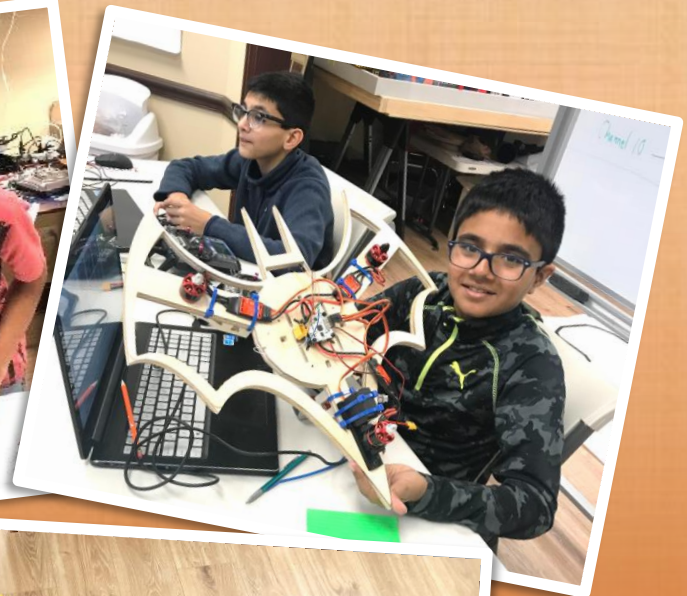
Non vitae, sed scholae discimus

[Too often,] we don't learn for life, but only for the lecture room

—Seneca, *Ad Lucilium*, c. 65 AD

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Extensive

Participation

We engage with TinkRers across a variety of ages. Depending on age, TinkRers can enroll in one of three tracks, each with a different focus.

Eligible ages

We group our TinkRers into three different age groups:

- Ages 7+
- Ages 9+
- Ages 12-15

We also happily work with 1st graders; please call us to ask about details.



Tracks

We organize our experiences across three tracks, each of which has different age-eligibility requirements:

Track	Description	Age availability		
		7+	9+	12-15
Exploration	Introductory <u>6-week</u> projects that provide exposure to wide ranges of topics, e.g., coding, robotics, design.	✓		
Emphasis	<u>12-week</u> sequence of projects that provide depth in a particular subject area.	✓	✓	✓
Immersion	<u>Nine-month</u> sequence of immersive STEAM projects that build upon one another to truly deepen learning.			✓

Engaging

How We Engage with TinkRers

We engage with TinkRers across our age groups differently. Depending on their age, we use an instructional model which offers TinkRers two types of sessions:

1. Each TinkRer attends a once-weekly Instructor-Led session.
2. Once-weekly Open-Lab sessions are available to age groups 9+ and up.



1. Instructor-Led Sessions

Availability: All age groups

During these sessions, instructors will teach, guide, and support TinkRers on specific elements of their projects related both towards skillset development and problem-solving enhancement.

2. Open-Lab Sessions

Availability: TinkRers in 9+ age groups and above

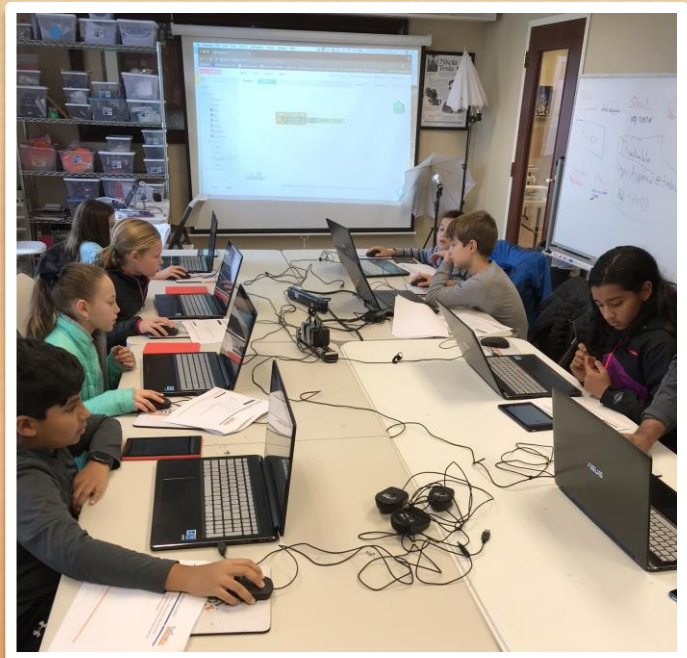
During these instructor-supervised sessions, focus is placed on creative exploration and inspiring curiosity. TinkRers are provided full use of our Engagement Center to further hone their skillsets and find new ways to solve the problems outlined in their projects. TinkRers will interact with other TinkRers from different projects and age groups to discuss problems, generate new ideas, and collaborate on solutions that they might not have otherwise devised on their own.

Imaginative

Open Lab—something truly special

For TinkRers aged 9 and above, we offer something truly unique to TinkRworks called Open Lab. During these sessions, TinkRers are free to make further progress on the projects in which they are currently enrolled, or...they are allowed to explore any STEAM topic of interest to them, all under guided supervision of our instructors!

Over the past year, TinkRers of various age ranges have made beautiful pieces of electronic artwork, catapults with wireless-launching capabilities, electronic devices to measure heart rates, carbon-monoxide sensors, laser trip wires, wearables (including hats with LEDs, pillows with lights and sounds, shirts with embedded lights), 3D-printed chassis for robots, and, of course, 3D-printed fidget spinners.



Open Lab is a place where TinkRers get a chance not just to dream, but to bring their dreams to life. **Open Lab is included with all 9+ enrollments**; multiple timeslot options are available and can be schedule separately.

“Open Lab is my favorite part of TinkRworks—I get to make anything I can imagine.”

—5th Grade TinkRer

“I can’t get enough of Open Lab!” —6th Grade TinkRer

“Open Lab is a parent’s dream. My daughter would come every day if she were allowed.”

—TinkRer parent

Immersive

Weekly Engagement Summary

Hourly engagement per week will be different based on the age group of the TinkRers, and will comprise of combinations of Instructor-Led Sessions and Open-Lab Sessions. The total weekly engagement hours for any project or track are summarized as follows:

Age Group	# of weekly sessions		Session duration		Total weekly engagement
	Instructor-Led	Open-Lab	Instructor-Led	Open-Lab	
7+	1	0	1.25 hours	N/A	1.25 hours
9+	1	1	1.5 hours	1.5 hours	3 hours
12-15	1	1	1.5 hours	1.5 hours	3 hours

As an example, a 9+ TinkRer enrolled in an Exploration Project is enrolled for a total of 5 weeks. During the project, the TinkRer would come to our Engagement Center two times per week (once for an Instructor-Led Session and once for an Open-Lab session), for a total of 3 hours per week, or 15 hours for the entire project (3 hours per week across 5 total weeks).



Enrollment

Pricing

Base pricing is provided below and is dependent upon age group, project length, and also project type. With the exception of the 7+ year old age group, pricing includes both weekly Instructor-Led Sessions and Open-Lab Sessions (Open Lab sessions are to be scheduled separately).

Age Group	2018 Base Pricing		
	Exploration Projects ¹	Emphasis Track ²	Immersion Track ³
7+	\$229	\$599	N/A
9+ 12-15	N/A	\$939	\$2,249



Please note that some projects may have additional material fees in addition to the base prices listed above. Also, some classes have term lengths that are different from those described above; prices of these classes will be explicitly cited.

Additional Discounts

Sibling discounts and referral discounts both apply. Sibling discounts are 10% off for each sibling concurrently enrolled. Referral discounts of 5% come in the form of course credits and apply to both the referring party as well as the party referred.

Begin the Journey

Enrollment is now open and will continue until projects and tracks are filled or until the first day of any given project/track. Here are two ways to enroll:

1. **Online enrollment** through our website: www.TinkRworks.com.
2. **Phone enrollment** by calling us directly at 708-401-5956 anytime Monday-Friday from 9:30 am – 7:30 pm CT, and on Saturdays from 10:00 am – 5:00 pm.

Comprehensive

2018 Winter & Spring Project Snapshot: 7+

To facilitate the selection process, a high-level snapshot of our projects and tracks is outlined below. Detailed descriptions of each project start on Page 11.



Week Starting

Age	Days & Time	Week Starting											
		Jan.				Feb.				Mar.			
		8	15	22	29	5	12	19	26	5	12	19	26

7+

Monday
5:30 – 6:45 pm

Intro to 3D Design
Jan 22 – April 16

Tuesday
4:15 – 5:30 pm

Intro II: Lego Mindstorms
Jan 23 – April 17

Wednesday
4:15– 5:45 pm

Art Electric
Jan 24 – Feb 28

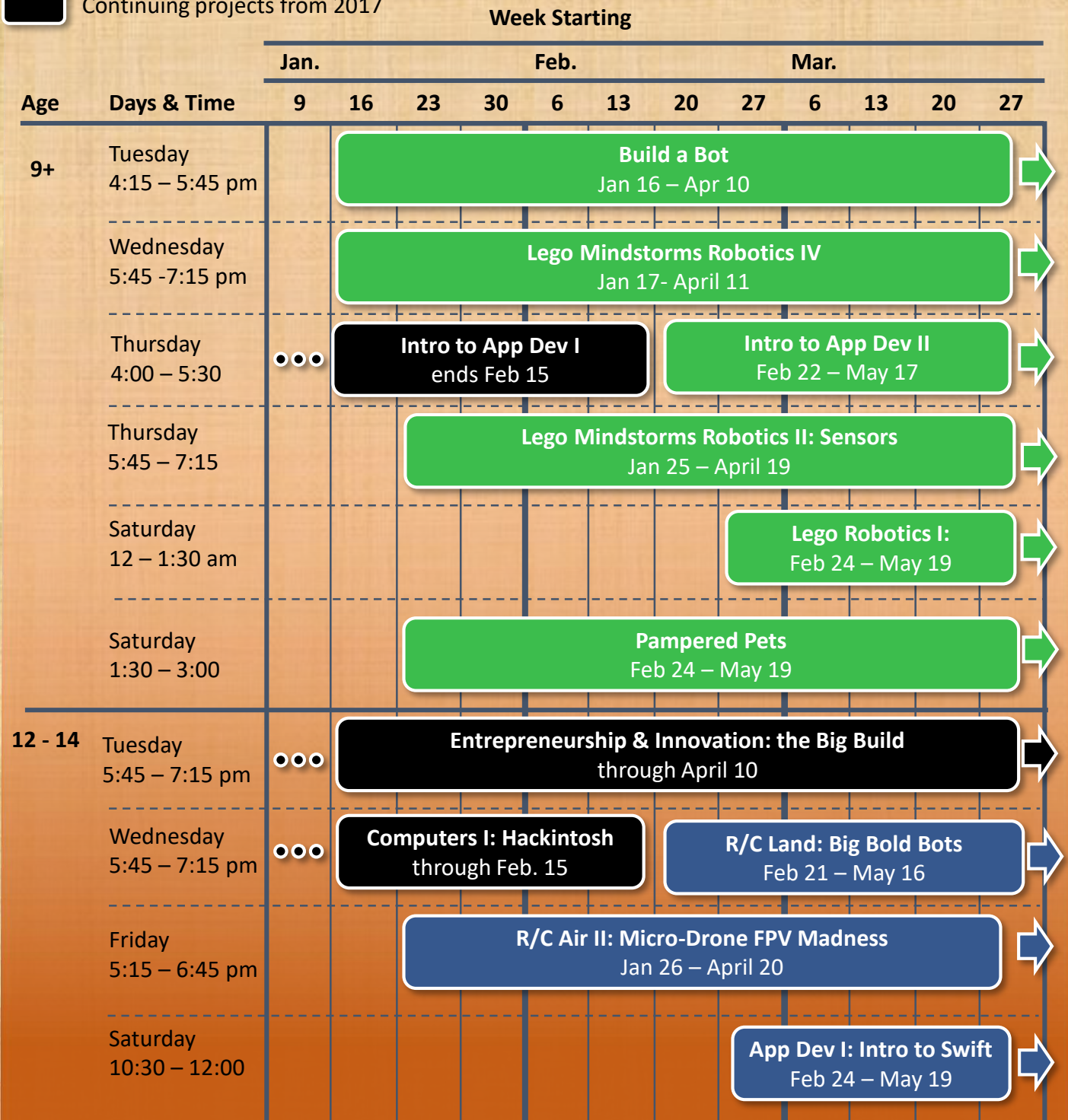
Comprehensive (cont.)

2018 Winter & Spring Project Snapshot: 9+ and 12+

Project Legend

- Age 9+ new projects
- Age 12-14 new projects
- Continuing projects from 2017

Detailed descriptions of projects are provided starting on Page 11. All dates and times listed are for Instructor-Led Sessions only; Open Lab Sessions are to be scheduled separately.



2018 Winter & Spring Projects

Ages 7+

During the Winter & Spring 2018 season, we offer **one Exploration-Track Project** for the 7+ age group and **two Emphasis-Track Projects**. The selected Exploration project focuses on developing balanced capabilities across our disciplines, while the Emphasis projects focus in specific areas of making and design.

Age 7+ Emphasis-Track Project (12 weeks)*



1. Into to 3D Design

Price: \$599

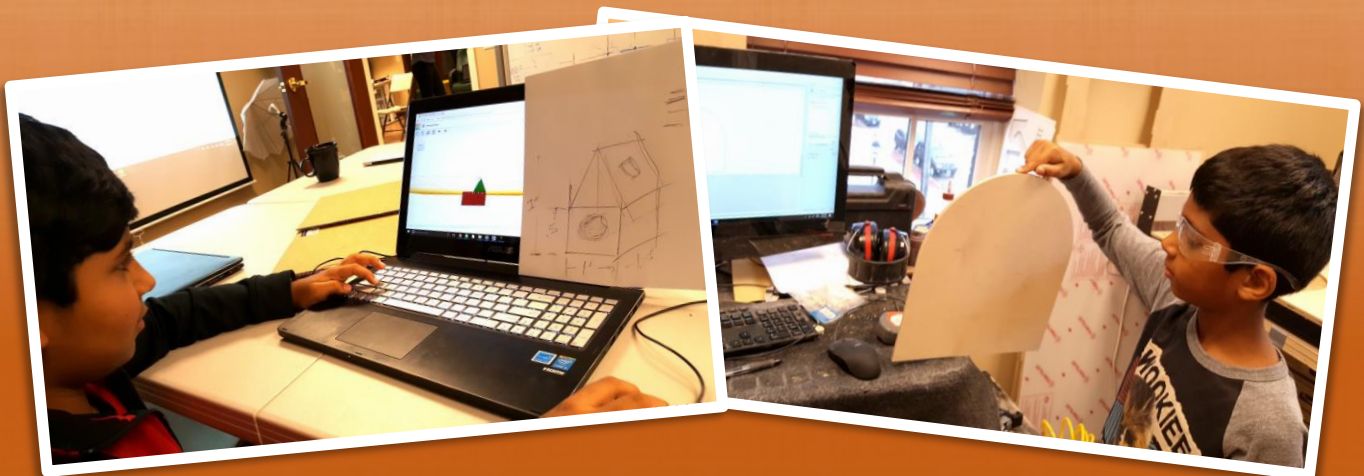
Mondays

Dates: January 22nd – April 16th

Times: 5:30 – 6:45 pm

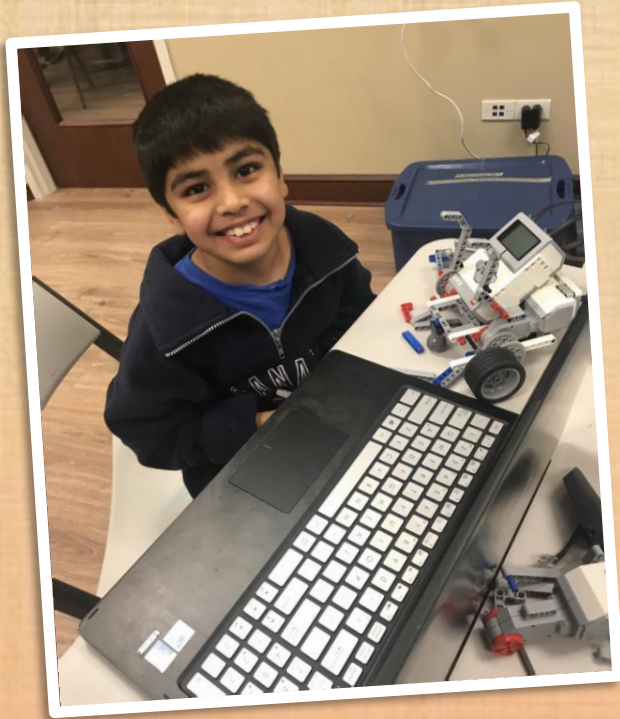
In this class, TinkRers will learn basic skills of design and digital making to take a design from idea to product before their very eyes! The class will focus on prototyping technologies, including 3D printing. TinkRers will learn to freehand sketch and edit design dimensions before converting these sketches to software for fabrication. For the 3D printing, TinkRers will learn and perfect their TinkerCAD skills to create 3D printable models. In the end, TinkRers will combine these newly learned skills to create their very own project such as a TinkRtoolbox, complete with 3D printed tools, a diorama filled with objects they create, or a furnished doll house.

The skills TinkRers will develop include drafting, dimensioning, spatial awareness, CAD design, and 3D printing.



2018 Winter & Spring Projects

Ages 7+ (continued)



“You guys are sneaky—I don’t like math but you guys tricked me into using it and I didn’t know it. For the first time I really understand it!”

—3rd Grade TinkRer

Age 7+ Exploration-Track Project (5 weeks)



2. Intro to Robotics II: Lego Mindstorms

Tuesdays

Price: \$599

Dates: Jan. 23rd to April 17th

Times: 4:15 – 5:30 pm

The Intro to Lego Mindstorms Robotics classes are exciting beginner classes for 7 and 8 year-old TinkRers to learn all about the basics of creating robots using Lego Mindstorms technology! In this intermediate beginner class, TinkRers will hone and expand the skills they learned in the first Intro to Robotics Class. They will be introduced to more parts and sensors, as well as compete to create more complicated builds and increase their EV3 programming skills. This class is a fun and engaging introduction to the world of robotics for youngsters and will help prepare them for more advanced classes and First Lego League (FLL).

Prerequisite: Intro to Robotics I, or instructor consent

2018 Winter & Spring Projects

Ages 7+ (continued)

Age 7+ Emphasis-Track Project (6 weeks)



3. Art Electric

Price: \$279

Wednesdays

Dates: Jan. 24th to Feb. 28th

Times: 4:15 – 5:45 pm

In Art Electric, children will bring artwork to life by combining electronics with the artwork they create! During this 6-week project, children will first choose a wooden template—such as animals, trees or snowmen—and then use LEDs, sensors, micro-computers, and of course lots of paint, to create beautiful artwork. They then will code the electronics to light up and play different sounds when people approach. Best of all, the children take their electronic artwork home with them at the end!



2018 Winter & Spring Projects

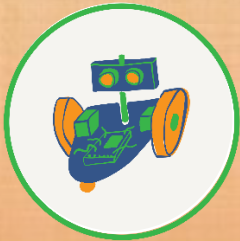
Ages 9+

For our 9+ age group, we offer a breadth of engagements spanning robotics, app development, digital design, and electronics. In total, we offer 6 Emphasis-Track offerings of 12 weeks.

In addition to the dates/times below, 9+ TinkRers also have access to a weekly **Open Lab session** which parents can schedule separately.



Age 9+ Emphasis-Track Project (12 weeks)*



1. Build-a-Bot

Tuesdays

Dates: Jan. 16th to April 10th

Times: 4:15 – 5:45 pm

Price: \$939

During Build-a-Bot, TinkRers will design and build their own robotic chassis, and will learn how to incorporate motors, sensors, and other electronics to bring their robot to life! After learning about each of these electrical components, children will then spend time integrating them and installing them on their chassis. TinkRers will spend time coding their robots to perform movements, sense their environment, and delight their humans with light and sound displays. TinkRers will also teach their robots to perform navigation tasks such as follow walls and avoid obstacles!



2018 Winter & Spring Projects

Ages 9+ (continued)

For the 9+ age group, in addition to the dates/times below, TinkRers also have access to a weekly **Open Lab session** which parents can schedule separately.

*Age 9+ Emphasis-Track Project (12 weeks)**



2. Lego Mindstorms Robotics IV: **Passive and Active Attachments**

Price: \$939

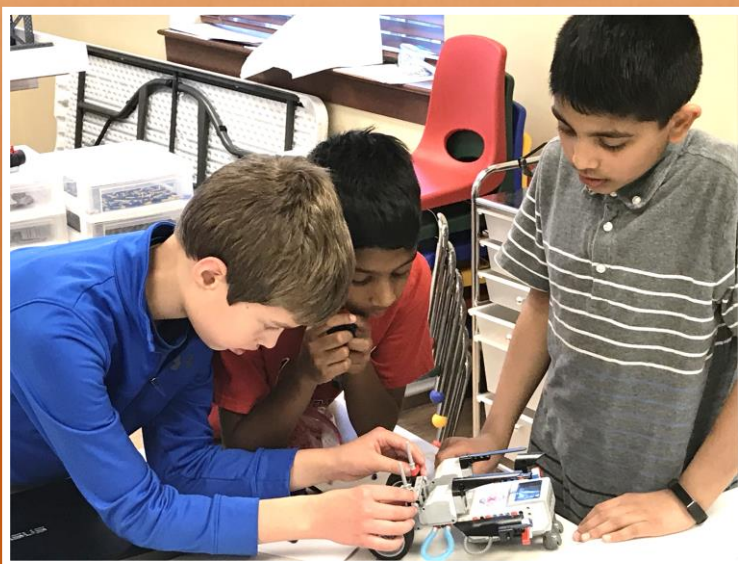
Wednesdays

Dates: Jan. 17th to April 11th

Times: 5:45 – 7:15 pm

In this fourth installment of TinkRwork's program in Lego Mindstorms Robotics, TinkRers will learn about the importance of Passive (those not using electronics) and Active attachments (those using electronics) to hoist, clench, drag, and drop items. TinkRers will learn about attachments such as trap doors, rakes, carabiners, and fork lifts, and integrate them into robotic devices that they build and code. As always, TinkRers will test their skills and robots by facing many carefully-crafted challenges that are both fun and highly relevant. This project is an absolute must for those aspiring to enter the field of competitive robotics! Bring it on!

Prerequisite: *Lego Mindstorms Robotics III or consent of instructor.*



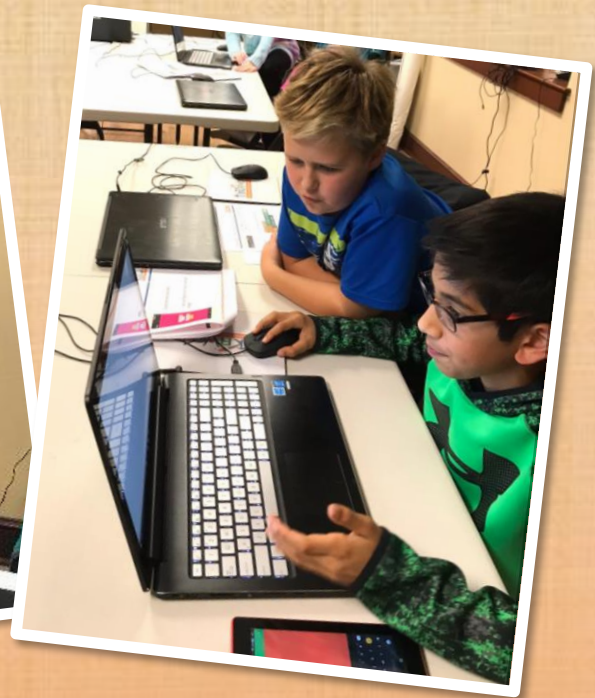
***“TinkRworks opens
the door to where
innovation and
imagination meet!
So well run...”***

—TinkRer parent

2018 Winter & Spring Projects

Ages 9+ (continued)

For the 9+ age group, in addition to the dates/times below, TinkRers also have access to a 1.5-hour weekly **Open Lab session** which parents can schedule either ahead of time or during the first session.



Age 9+ Emphasis-Track Project (12 weeks)*



3. Intro to App Dev II

Price: \$939

Thursdays

Dates: Feb. 22nd to May 17th

Times: 4:00 – 5:30 pm

App Dev II builds on the skills your child developed in Introduction to App Development and...**allows TinkRers the opportunity to develop apps for Android devices (e.g., Kindle Fire).** This 12-week project will reinforce the fundamentals of application development for tablet computers and introduce new capabilities that will allow TinkRers to create richer applications such as video games and quiz apps.

Prerequisite: Intro to App Dev I or instructor consent

2018 Winter & Spring Projects

Ages 9+ (continued)

For the 9+ age group, in addition to the dates/times below, TinkRers also have access to a weekly **Open Lab session** which parents can schedule separately.

Age 9+ Emphasis-Track Project (12 weeks)*



4. Lego Mindstorms Robotics II: Sensors Price: \$939

Thursday

Dates: Jan 25th to April 19th

Times: 5:45 – 7:15 pm

Building upon the foundational learnings of Lego Robotics I, this 12-week follow-up project allows TinkRers to tackle more complex challenges with robots they design from scratch, often times using multiple simultaneous sensors to accurately sense the environment and react to it. Advanced building techniques will be taught to TinkRers that will allow them to design and build reliable robots suitable across a variety of different courses and terrains. A large portion of this project will also be around developing enhanced coding techniques where TinkRers will learn—and implement—concepts such as nested conditional statements, variables, and sophisticated logic statements. This is a wonderful follow-up course for TinkRers interested in continuing their Lego Mindstorms adventure!

Prerequisite: Lego Mindstorms Robotics I or instructor consent.



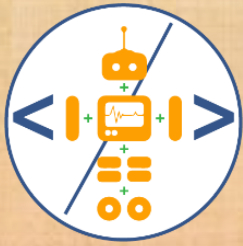
*“Why can’t we have
TinkRworks as a
subject in school?
—4th Grade TinkRer*

2018 Winter & Spring Projects

Ages 9+ (continued)

For the 9+ age group, in addition to the dates/times below, TinkRers also have access to a weekly **Open Lab session** which parents can schedule separately.

Age 9+ Emphasis-Track Project (12 weeks)*



5. Lego Mindstorms I: Introduction to Lego Robotics

Price: \$939

Saturdays

Dates: Feb. 24th to May 19th

Times: 12:00 – 1:30 pm

This class is perfect for TinkRers who seek a foundational entry into robotics and using Lego Mindstorms technology! In this 12-week project, TinkRers will learn robotic nomenclature and build their first set of bots by using three-dimensional visual environments enabling the development of 3D spatial relationships. TinkRers will gain significant familiarity with the structural elements (beams, axles, pins) and electrical elements (sensors, "the brick", motors) of the robots, and once their builds are completed, they will learn how to bring their bots to life through use of the Lego Mindstorms coding environment, EV3. TinkRers will program their bots and complete various challenges, thereby developing their understanding of critical robotic-design and understanding of coding elements while improving their logic and analytical capabilities. Welcome to the exciting world of LEGO Mindstorms Robotics!



"I've found something I really love and something that is different from anything I've ever done before. Thank you for starting [TinkRworks]. I love everything about it and owe you something big!"

—3rd Grade TinkRer

2018 Winter & Spring Projects

Ages 9+ (continued)

For the 9+ age group, in addition to the dates/times below, TinkRers also have access to a weekly **Open Lab session** which parents can schedule separately.

Age 9+ Emphasis-Track Project (12 weeks)*



6. Pampered Pets

Price: \$939

Saturday

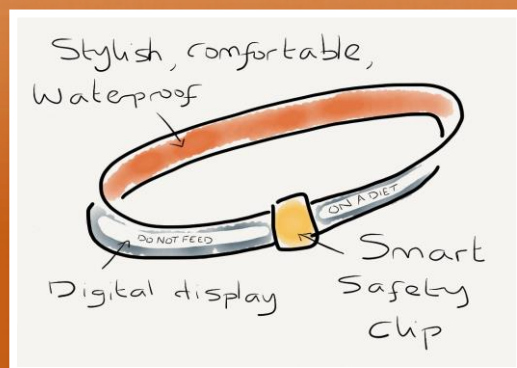
Dates: Feb. 24th to May 19th

Times: 1:30 – 3:00 pm

TinkRers and TinkRpets alike will love the gadgets created for their tech-savvy Pampered Pet! During this project, TinkRers will be developing projects such as a Smart collar and leash for their dog or cat, smart food and water dishes or monitoring systems for a pet door!

As part of their project, TinkRers will have access to a variety of different technologies that they can incorporate into their smart collar and leash combination. As an example, TinkRers may wish to incorporate LEDs into their project to improve visibility during night time walks, a thermometer to monitor whether the temperature is safe for pet walking, a speaker that plays phrases your pet would say, and even a mini GPS so that the pet owners can track the coordinates of their pets. TinkRers will use Arduino mini computers to program the colors and sounds the collar. They will also learn about infrared signaling and program some of their pet gadgets to be remotely controlled!

Be prepared to be the coolest and most tech savvy pet owner on the block!



“TinkRworks is quite possibly the most elite STEM learning center in the nation and possibly worldwide”

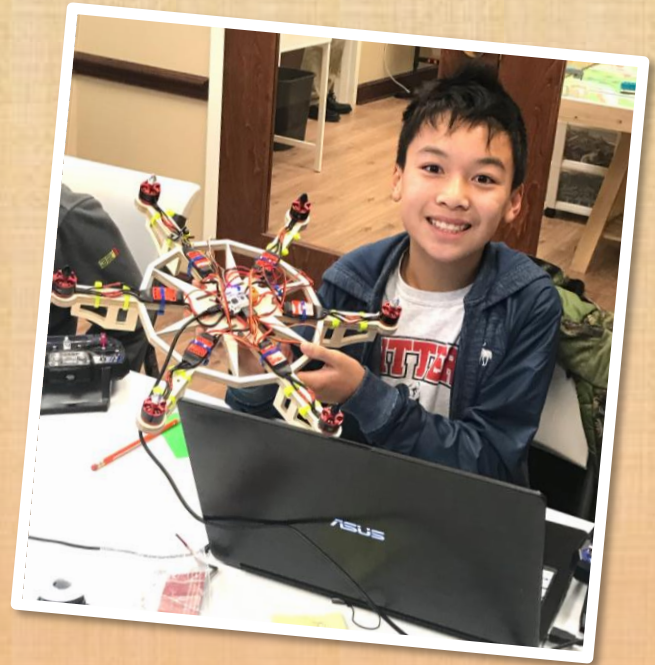
—TinkRer parent

2018 Winter & Spring Projects

Ages 12-15

For our 12-15 age group, we are offering three emphasis track of 12 weeks. In addition to one course that introduces iOS coding, two more cover in depth design, making and coding of drones and robots.

In addition to the dates/times below, 12-15 TinkRers also have access to a weekly **Open Lab session** which parents can schedule separately.



Ages 12-15 Emphasis-Track Project (12 weeks)*



1. R/C Land I: Big Bold Bots

Price: \$1,228**

Wednesdays

Dates: Feb. 21st to May 16th

Times: 5:45 – 7:15 pm

Big Bold Bots is the class for the TinkRer who really **loves robotics**. In this class, TinkRers will design and build a large-scale 30-50 pound robot to serve their needs. They will start with CAD software to design and construct their chassis. Once their frame is built, they then will then incorporate high-powered drill motors with gearboxes onto their frames and will attach their wheels (the same ones used in the combat-bot shows that some of the TinkRers watch!). Once done, they will incorporate electronic speed controls and a wireless receiver, and then establish manual control to their robot through a wireless transmitter. Once done, they then will integrate a Raspberry Pi computer on their powertrain and program their Big Bold Bots to perform autonomous tasks of their choosing. As part of this program, TinkRers will be exposed to the Python language.

Bring on the Big Bold Bot, baby!

*Dates and times subject to change. For the most up-to-date information on our programs, please visit www.TinkRworks.com

**Includes material costs of \$289 for electronics outlined above plus several other electronic items.

2018 Winter & Spring Projects

Ages 12-15 (continued)

For the 12-14 age group, in addition to the dates/times below, TinkRers also have access to a weekly **Open Lab session** which parents can schedule.

Ages 12-15 Emphasis-Track Project (12 weeks)*



2. R/C Air II: Micro-Drone FPV Madness

Price: \$1,039**

Fridays

Dates: Jan 26th to April 20th

Times: 4:15 – 5:45 pm

TinkRers will soar to new heights (or at least hit the ceiling!) as they learn the fundamentals of remote-control wireless communications through the building, coding, and flying of **micro drones** – perfect for flying inside your house during the Chicago winter. As part of this 12-week project, TinkRers will not only design and build their own microdrones that launch from their hands, **but they will incorporate video transmitters in their drone and then learn to fly them with their very own first-person view (FPV) goggles that they will take home!**



In this project, TinkRers will dive into the world of wireless design and build a fully-functioning wireless system that links their flight transmitter to their drone by using advanced electronics including motors, receivers, and a flight-controller board that they will program to tune their drone to the way they fly.

These drones will be fast, nimble, and **SAFE**—ideal for indoor flying and racing. Experienced and beginner pilots alike are invited to partake in this exhilarating class. Definitely, this is a one-of-a-kind opportunity in the Chicagoland area!

*Dates and times subject to change. For the most up-to-date information on our programs, please visit www.TinkRworks.com -21-

**Includes material costs of \$100 for electronics outlined above plus several other electronic items.

2018 Winter & Spring Projects

Ages 12-15 (continued)

For the 12-15 age group, in addition to the dates/times below, TinkRers also have access to a weekly **Open Lab session** which parents can schedule separately.

Ages 12-15 Emphasis-Track Project (12 weeks)*



3. App Dev I: Intro to Swift for iOS

Price: \$939

Saturdays

Dates: Feb. 24th to May 19th

Times: 10:30 – 12:00 am

The iPhone has revolutionized mobile devices, and not only has it sparked the creation of millions of Apps developed by large corporations, but also the app development done by school-aged kids in their spare time! This ecosystem enables anyone to create any App that they can imagine. This 12-week course will introduce TinkRers aged 12-15 to building Apps on an iPad! To do so, TinkRers will learn the fundamentals of the Swift programming language, and then come up with ideas for an App that they'd like to build. With instructor guidance (and approval), they'll then work to make that App become reality! Best of all, they will be able to use their app at home on their own iOS device (iPAD, iPhone, etc.) and show their friends and family. Let's get started!

Prerequisite: Previous experience with a text based programming such as JAVA, C, Python or instructor approval.





Sparking CREATIVITY
Fostering INNOVATION
Sharpening PROBLEM-SOLVING skills

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