Makerspace Teacher Training Program

Presented by Propeller and IDIYA, powered by Capital One Bank

Program Overview

Poised to transform learning in our schools, the maker movement counteracts traditional standards, testing and uniformity, providing a fresh approach to learning that emphasizes creation and creativity – products and processes born from tinkering, playing, experimenting, expressing, interacting and collaborating – and exploits new digital tools to make, share and learn across space and time, do-it-yourself (DIY) style. We believe every school needs a place where students can learn the digital skills of advanced manufacturing and expand their curriculum to include the creative environment of a makerspace.

Apply Online at bit.ly/MakerspaceTeacherTraining

Deadline: November 23, 2015 at 5:00pm (CST)

Program Benefits

- Teachers receive training on and will become proficient in cutting-edge makerspace and digital literacy technologies, such as 3D printing and modeling, Arduinos, and instruction on how to operate CNC routers, laser cutters, vinyl cutters, table saws, wood shop equipment, etc.
- Teachers participating in the training will receive a class set of Arduinos.
- Each teacher will be eligible for one student class field trip to the IDIYA makerspace.
- One school will be selected to receive an in-house makerspace (buildout Summer 2016) including the following equipment: (3) 3D printers, (1) laser cutter, computers, CNC Mill, hand tools, cordless drills, air filtration, vacuum, Arduino library, soldering irons, buildout, furniture and fixtures, consulting and buildout assistance.

Curriculum Topics & Program Dates

**All sessions are Saturday mornings from 10am-12:30pm and take place at the IDIYA makerspace facility at 2705 S. Broad St., New Orleans, LA 70125.*

January 9, 2016 – Intro to Makerspace

Participants will be introduced to the maker movement and will be able to state the history of making and invention. Participants will be challenged with an initial project to make something creative. Participants will then be re-tested at the end of the course through a capstone project that will demonstrate improvement in their making and technological ability.

January 16, 2016 – Intro to 3D Printing

Participants will download a 3D model of their choosing and print the model using a 3D printer. Participants will troubleshoot the print and use the settings of the printer to improve print quality. They will then be given a challenge of improving a print that would otherwise fail.

January 23, 2016 – CAD 1 - Tinkercad for grades 6 - 8

Participants will be introduced to computer-aided design (CAD) using the Tinkercad software and create a 3D model with emphasis in geometry and measurement. Participants will be able to use the basic tools within the program to create and manipulate a real life 3D model.

January 30, 2016 – CAD 2 - Fusion 360

Participants will be able to use more advanced 3D design techniques to create a 3D model based on a real world object. Then participants will modify their digital design to enhance the physical model in preparation for a 3D print.

February 13, 2016 – CAD 3 - 3D Printing

Participants will print and troubleshoot the models created in CAD 2. Participants will be able to modify the 3D print settings in order to achieve the maximum quality for their print. They will embed a physical object within their 3D print in order to test the tolerances of their model and print quality.

February 20, 2016 – littleBits 1 - Circuits

Participants will be introduced to the littleBits development platform through basic circuitry. They will demonstrate knowledge in simple physical circuits by utilizing Ohm's law and drawing circuit schematics.

February 27, 2016 – littleBits 2 - Programming

Participants will create code to utilize the circuits created in littleBits 1. They will be able to declare and use variables, perform basic calculations, and use loops for iteration.

February 27, 2016 – littleBits 3 - Integrated Arduinos

They will learn how to code an integrated Arduino Uno using a language based on C/C++. Participants will be able to read input and output from their circuits and have the Arduino Uno make decisions based upon those inputs.

March 12, 2016 – Arduino 1 - Intro to Arduino Uno

Participants will be able to identify and describe the different parts of an Arduino Uno and how they can be used within a circuit. They will program the Arduino Uno to interact with LED's in order to create different light patterns through coding.

March 19, 2016 – Arduino 2 - Circuitry

Participants will create a circuit with a breadboard, jumper wires, and circuit components, programming the Arduino Uno to interact with that circuit. They will modify the circuit based upon different input information, and have the Arduino Uno control a variety of output devices including servos, LED's, and speakers.

March 26, 2016 – Arduino 3 - Modify Your World

Participants will modify a device using circuitry and an Arduino Uno in a way that improves the operation of that device. Participants are asked to create a unique design and build a working prototype.

April 2, 2016 – Adobe Illustrator 1 - Intro to Laser Cutting

Participants will be introduced to Adobe Illustrator in preparation for integration with a laser cutter. They will demonstrate proper laser cutter operation through the creation of a unique object utilizing several different file formats and physical materials.

April 9, 2016 – Adobe Illustrator 2 - Laser Cutting Design

Participants will be able to utilize the Adobe Illustrator software to create more advanced models to be used in the laser cutter. They will demonstrate vectoring, line tracing, scanning, and use of color for speeds and feeds.

April 16, 2016 – Makerspace Pedagogy 1

Participants will be able to set-up and organize a makerspace classroom for middle school students. They will demonstrate best practices for classroom success through proper planning and classroom management techniques.

April 23, 2016 – Makerspace Pedagogy 2

Participants will develop sustainable techniques to utilize in their classrooms for optimum student success. They will create a plan for potentially struggling students and demonstrate best practices for student-centered project creation.

May 7, 2016 – Capstone Project

Participants will give a presentation to the cohort regarding a culminating project of their own choosing. They will submit a plan for implementing previously learned technologies in their classrooms. Participants will establish a help network to aid with potential struggles throughout the year.

Makerspace Instructor: Andrew Winstead

Andrew Winstead grew up in Fort Smith Arkansas, where he was active in Boy Scouts, becoming an Eagle Scout at the age of 15. Influenced by one of his high school teachers, he pursued a career in education while attending the University of Arkansas. Andrew graduated in 2009 with a degree in Physics and again in 2010 with a Master of Arts in Teaching. He taught his first three years in El Dorado, Arkansas, and it was during this time that he discovered his educational niche. Andrew had the opportunity to attend a robotics workshop sponsored by NASA and organized through Louisiana Tech University. He quickly became addicted to coding and technology implementation in the classroom. He has taught robotics with the Arduino development platform to over 300 students, along with AP Computer Science and several traditional math and science courses. He was a member of the pilot class for Operation Spark, and attended computer science training through Project Lead the Way. Andrew currently runs his own makerspace at Sci High in New Orleans, where he has seen great success with igniting a passion for hands-on learning among his students.

School Eligibility

- Must be located in Orleans Parish
- Priority will be given to schools that serve a 51%+ Free and Reduced Meal (FARM) population, as measured by the National Council on Education Statistics. To look up your most recent FARM population through the National Council on Education Statistics, please click this link, select Orleans Parish, click on your school

name, scroll down to the bottom, and divide the total FARM population by the total population enrolled at your school.
- (optional) Space and interest from the school leader for an in-house maker space, including the above mentioned equipment

Teacher Eligibility

- Teachers must commit to attending 13 out of the 16 sessions.
- Teachers must teach public school students in grades 6-8 in Orleans Parish.
- Teachers demonstrate interest in incorporating makerspace technology and curriculum in his/her regular teacher curriculum.
- Teachers will be required at end of program to submit plan to incorporate digital literacy and makerspace tools in their classrooms for the 2015-16 and 2016-17 school years.
- Teachers must fill out the online application here bit.ly/MakerspaceTeacherTraining by Monday, November 23, 2015 at 5pm, and we will notify you of your acceptance by Friday, December 11, 2015.

FAQ

When will the school and teachers knew if they have been selected for the in-house Makerspace?

Schools and teachers will be notified by May 15, 2016 which will be followed by a buildout in June 2016.

What's the criteria for selecting which school will receive the in-house makerspace?

Makerspace award selection will be conducted by a committee made up of representatives from Capital One Bank, IDIYA, and Propeller. The process will include an interview and written presentation. Selection criteria will include the following categories:

- Successful completion of the curriculum and demonstrated proficiency/mastery of content by both teachers from the school.
- Quality of lesson plans submitted.
- Demonstrated support from the school administration.
- Viability of building a makerspace within the school site. We estimate a minimum of 1,500 square feet minimum for space.
- Implementation plan from the school regarding how the makerspace will be utilized.

How much money does my school need to contribute in order to participate in the teacher training program and field trips?

The program is completely funded by Propeller and Capital One Investing for Good, so we do not charge a fee to participants or their schools.

If selected, when would the buildout of the makerspace begin?

The buildout would begin in June 2016 and to be completed by July 2016.

Can my school participate in the teacher training program if we do not have the space for a makerspace?

Yes, your school can still participate in the teacher training program component with the understanding that you may not be selected as the school to receive the in-house makerspace and its equipment.

My school houses students in grades K-8. Is the teacher training program limited to schools that only have grades 6th-8th?

No, your school can house students in grades K-8, but only the teachers teaching students in grades 6-8 can participate in the program.

Would my teachers' participation in this program interrupt my school's daily operations?

No, the weekly trainings will take place on Saturdays from 10AM-12:30PM and should not interfere with your daily operations.

How many teachers from my school are allowed to participate in the teacher training program?

We encourage each school to select two teachers to apply to our teacher training program. If fewer than two teachers or more than two teachers are interested, please contact Savannah Wheeler at swheeler@gopropeller.org.

When will the program begin?

The program will begin the first week of January 2016 and will end May 2016.

How many sessions am I required to attend?

You are required to attend 13 out of 16 sessions since each training is full of vital information.

What would I do in an average day of training?

For each class, teachers will demonstrate understanding and proficiency in the objective by completing the hands-on project assignment on their own.

Am I required to complete any projects?

Yes, each teacher will be required to submit lesson plans demonstrating how and when they will incorporate the maker objectives learned in their subject area.

If my school is not selected for the in-house makerspace, do I still receive something that states I have been trained as a Subject Matter Expert (SME) for the program?

Yes, all teachers who complete the course will receive a certificate of completion

What are the student objectives?

Students will build their own projects and demonstrate understanding through projects they can take home.

About Propeller: A Force for Social Innovation

Propeller: A Force for Social Innovation is a 501(c)3 nonprofit dedicated to supporting social innovation in New Orleans. We drive social, environmental, and economic impact in New Orleans by incubating ventures that have the potential to solve our city's most pressing issues. Our vision is to build a critical mass of entrepreneurs tackling key challenges in our issue areas of food security, water management, healthcare, and educational equity. GoPropeller.org

About IDIYA

The maker movement represents a technology-based extension of the do-it-yourself (DIY) culture. Makers are driven towards developing new pursuits in both engineering and the arts through unique applications of technologies. Makers are shortening the path from idea to realities, and eventually entrepreneurship, by creatively combining traditional and modern tools with community collaboration. IDIYA helps facilitate this movement by providing a place where members of our community come together to share ideas, tools, and skill-sets. myIDIYA.com

About Capital One Bank

Capital One Financial Corporation, headquartered in McLean, Virginia, is a Fortune 500 company with branch locations primarily in New York, New Jersey, Texas, Louisiana, Maryland, Virginia, and the District of Columbia. Its subsidiaries, Capital One, N.A. and Capital One Bank (USA), N. A., offer a broad spectrum of financial products and services to consumers, small businesses and commercial clients. We apply the same principles of innovation, collaboration and empowerment in our commitment to our communities across the country that we do in our business. We recognize that helping to build strong and healthy communities – good places to work, good places to do business and good places to raise families – benefits us all and we are proud to support this and other community initiatives. www.capitaloneinvestingforgood.com