THE EDUCATION FUND

FOR EXCELLENCE IN MIAMI-DADE PUBLIC SCHOOLS

2022-2023

Ideas with IMPACT

Idea Packet Sponsored by:

FPL

Finch! The Singing, Bird Brained Bot!

Project Finch! The Singing BirdBrained Robot!

Name Michael Sakowicz

Email msakowicz@dadeschools.net

School iPrep Academy North

Mail Code 7459

BIRDBRAIN LLC TECHNOLOGIES®

INSPIRING CREATIVE ROBOTICS

For information concerning Ideas with IMPACT opportunities including Adapter and Disseminator grants, please contact - Audrey Onyeike, Program Director
Ideas with IMPACT, The Education Fund | 305-558-4544, Ext. 113
audrey@educationfund.org | www.educationfund.org

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Sample Florida Common Core/CTE Standards

1.0 Demonstrate proficiency using specialized computer coding software.

2.0 Develop an awareness of programming languages.

3.0 Demonstrate proficiency using common software applications.

4.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.

5.0 Demonstrate comprehension and communication.

6.0 Demonstrate knowledge of different operating systems.

7.0 Demonstrate proficiency in basic programming.

LAFS.6.RI.1.AP
Provide a summary of the text based on details from the text.
Identify the main idea of a text.
Identify key details related to the main idea of a text.
Identify a factual summary/statement about the text.

SC.6.P.12.SS.1
Recognize that speed describes how far an object travels in an amount of time.

MAFS.6.G.1.AP.1b
Decompose complex shapes (polygon, trapezoid, and pentagon) into simple shapes (rectangles, squares, triangles) to measure area.

Additional Standards Provided By BirdBrain Technologies

https://learn.birdbraintechnologies.com/standards/

Disclaimer/Notation: *The above standards are specific to 6th-9th grades; however, this project meets standards for all grade levels (K-12) in reading/language arts, social studies, visual arts, and many other content areas that integrate to a STEAM initiative. A multitude of Common Core standards are easily met across the curriculum using the following plans and lesson ideas.*

Goals, Objectives, and background

The idea come to mind from a little birdie that landed on my finger some months ago! I received a Finch Robot as a trial for my classroom, hoping to be able to integrate and use for all learners, and use the supplied curriculum to augment what I was already teaching. As I went through the course and lessons and realized how well this would work for my students, I thought of the EdFund and how many other teachers in the district would be able to use the Finch Robot to teach all other grade levels and abilities of learners to code!

"*Finch! The Singing, BirdBrained Robot!"* engages students to be engaged, creative, forward thinking, logical, computer science and STEAM-designation ready- all while having an amazing class experience together! With easy-to-follow lessons and fun assignments, Finch Robot should land on the shoulder [*or desk*] of every Miami-Dade County Public Schools' educator!)

The Finch Robot allows students to learn the basics to block-based AND python coding languages by seeing the finch move in all directions that are entirely dictated by the user's programs. Students will learn trial and error debugging technique as well as how to code larger programs. Student activities include but are not at all limited to geometric shapes and patterns, 'line follow' tracks, and unlimited potential of self-creation. Other activities such as feedback interaction based on if/else statements in coding with python once students feel comfortable with line-based coding fundamentals in lessons.

The number of students working on the project with one Finch Robot can range from induvial or small groups (4-5 students) at a time. Whole group assignments can work well with the class by having students submit code and then the educator choosing whose code to run at a given time- onto the robot. This allows students to eagerly see their creation come to life one by one. Peer feedback is also valuable during this time. The age range can be from 8/9/10 years old in elementary school all the way to high school as the python code base package has many levels to work with and can be stopped when younger learners hit a wall that may be- beyond that scope of pedagogy. All levels of learners from ESE to GIFTED to inclusion populations can enjoy Finch projects as it allows a wide understanding of programming in a tangible and fun way.

Materials

One of the many great things about this project is the adaptation level. Educators need only a Finch Robot and a tablet to get started. BirdBrain Technologies has apps for iPad, Android, and Fire tablets (which may be important for tablet-only elementary class settings). For classes with laptops or desktops (PC/Mac/Chromebook), you too you will be fully prepared to unlock the same high ceiling potential of your students.

The more adaptation the better- and with just a little floor space, the Finch Robot can move around and come to life. Creativity is key, and physical books are not needed, just the online curriculum, which has all bases covered. Different add-ons may include markers, poster board, large-format paper, and other creative tools, to allow the robot to move around and draw. I previously have used carpet tape and markers and posterboard to add to the experience for students. Beyond those materials, creativity with students is key as well.

Resources

The internet is always a wealth of information; however, it can be a vast realm of too much for some students. I caution educators to allow students to look up information that specifically pertains to the project-based learning as being administered to keep learners on track. Guest speakers from industry such as Microsoft and other tech companies are a FANTASTIC way to more connections to this project and a list of virtual guests can be included in the package to educators if so desired.

How has this project benefited your students' academic achievement?

(ie. test scores, attendance, attitude changes, student projects, etc.)

Finch Robot has greatly improved not only student participation and overall attendance (*students WANT to show up for class labs when this project has engaged*!), however it has also afforded students to learn rudimentary levels of coding, (using block and Python), which in turn allows students to perform well on more advanced coding projects, such (*JS/HTML/C#/Java*). Allowing students to first grip coding with a hands-on creative manner removes barriers that often shuns many students away from computer science. I love that the EducationFund program grant has opened many avenues that parents and students may previously had not known existed.

Teachers Outcomes and Takeaways From Workshop

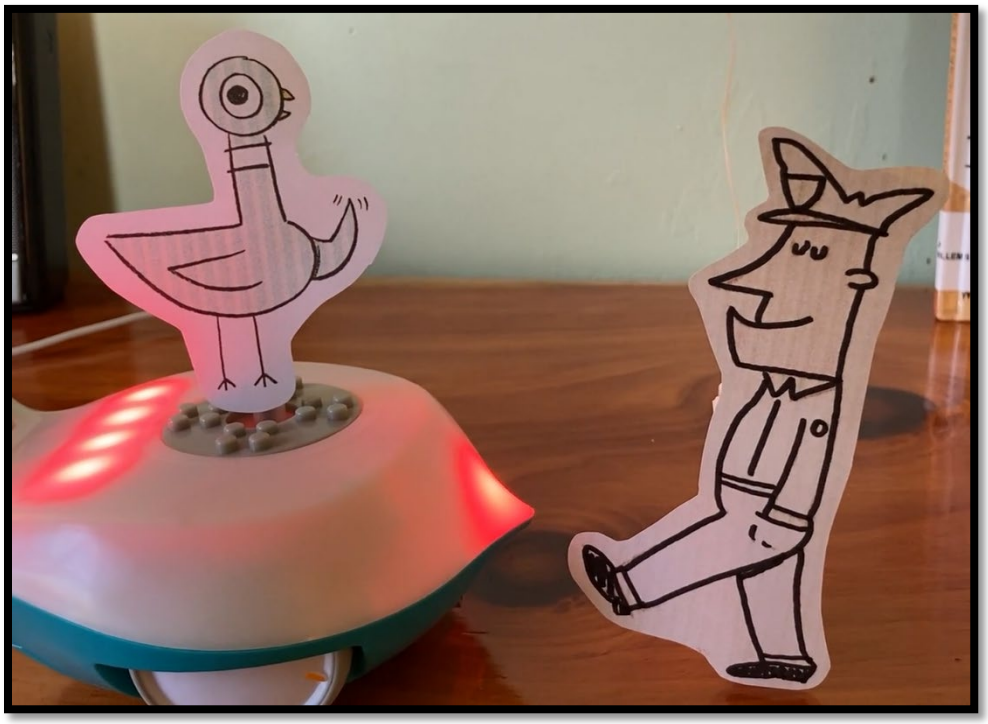
Teachers will... 1) Get to meet and play with Finch Robot and learn many different '*avenues*" the robot can move through! 2) See how simple (*never stressful*) the curriculum is for teachers, as well as their students! 3) View the different student grade level and ability levels that student may come in with and will still fall in love Block-Based and Python coding languages. 4) Learn how to adapt these lessons and activities within not only their own class labs, however also around the school within other general education areas! 5) Bring in community guest speakers/leaders and peers, who can build upon the fun, engaging methods of this curriculum and project base!

Overall Value

Finch Robot is a fun, exciting, and energetic way to bring students to code! Not just for fun, educators will see complete engagement, rigor, and response from students! Do you want to help your students' reading, writing, math, and science scores? Introducing a coding language project will aid your students' abilities by allowing their brain to expand in different ways never thought of before! Logical and computational thinking is not only becoming more of a requirement within the Florida Department of Education (www.fldoe.gov), but there is also data to prove how students move forward in primary, secondary and post-secondary school subjects. Parents also love to see their children doing something innovative, and your school will stand out from the rest! Teams that program and code, show huge gains general education areas (There is data going back for years which can be reviewed!)

Estimated cost for a teacher to adapt the project

At the low end, educators can expect to use about $150 of funds for each robot unit (3 units would be $450). Adding the cost of incidentals, such as markers, posterboard, construction/drawing paper, etc. should add about $25-50 and so $475-$500 would be the high-end cost.



Curriculum Area(s)

Math/Science/Computer Science/Engineering/Robotics/IT or PC Technology

Project Overview

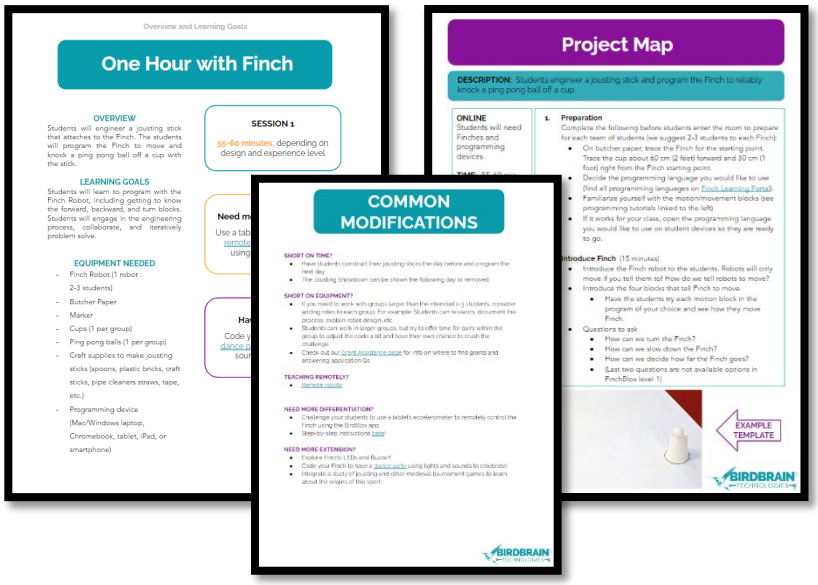
Educators can and should take liberty to customize the project experience to cater to all levels of learners and will know how to best serve their own students' needs, to bring the best opportunity to work with real components and parts that are easy to manipulate. The following links are direct from the BirdBrain Technologies curriculum writers and provide a great blueprint/baseline to get started with computer science. These are not the end all solutions and we hope you will feel free to expand on these lessons you and your population of students see fit, all while having a great time learning to program the Finch!

Start Teaching Now!

https://www.birdbraintechnologies.com/finch-start-teaching/

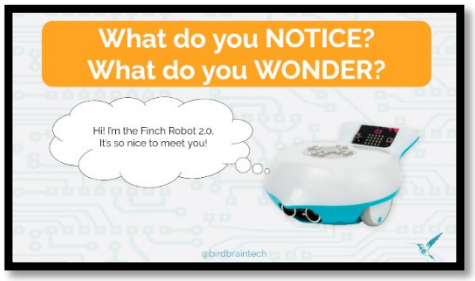
Step-By-Step (One Hour With Finch) Lesson Plan/Guide (For Teachers)

https://docs.google.com/presentation/d/1c7_GWsCB1Ytizyv7k3RbF0JyTAD_3I99oGYWPZUQhLY/edit#slide=id.g121b10247a3_0_44



Finch's First Day!

https://docs.google.com/presentation/d/1h3DXtCc6t_GusIJjushUxFWJDLJ_Rt_Xq6AbzHOy1pQ/edit#slide=id.g1237d0889c6_1_457



Finch Robot Activities Library!

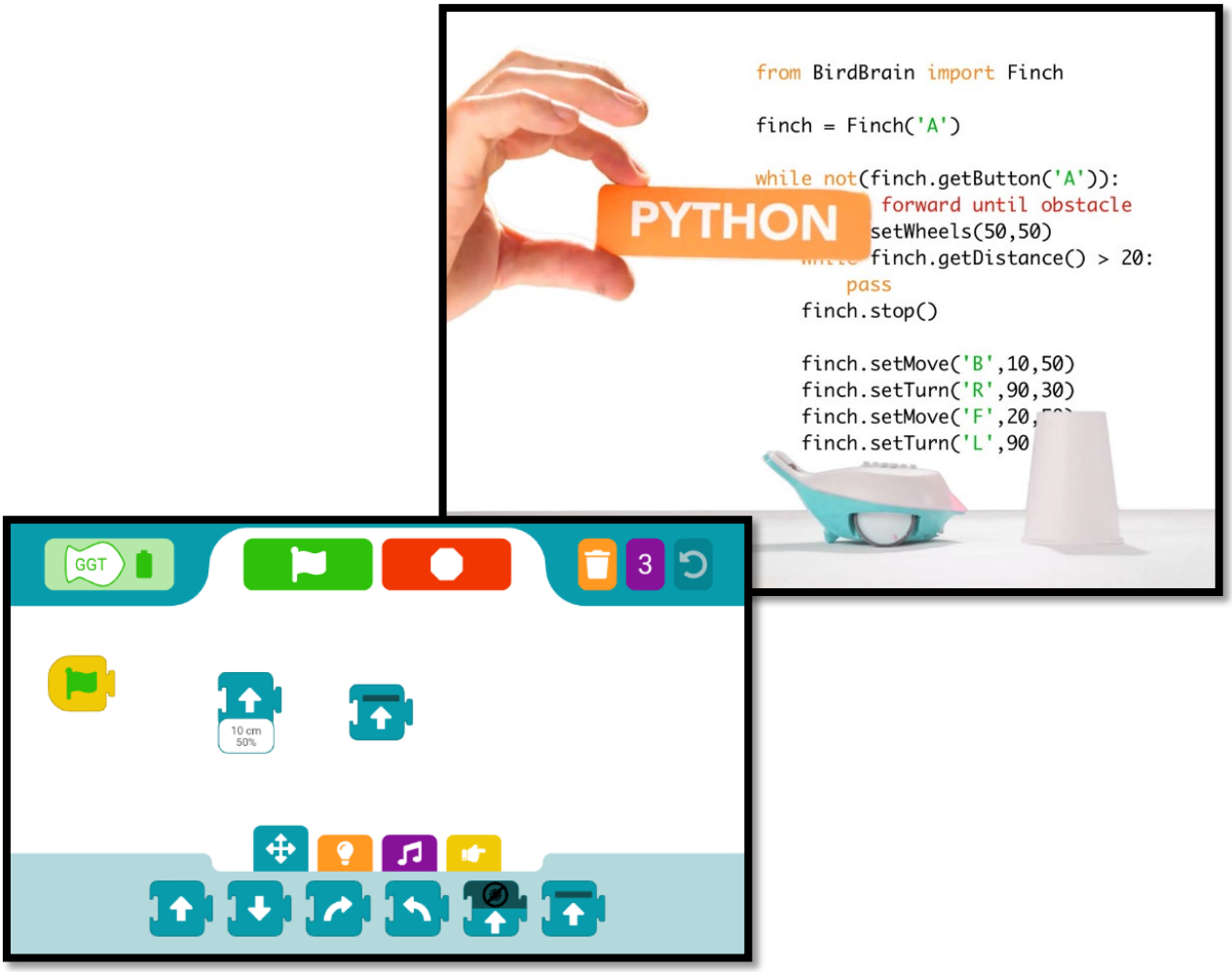
The following link provides many pre-made activities, ideas and fin ways to delivery the Finch Robot to your students!

https://learn.birdbraintechnologies.com/finch/activities/

Going Virtual or Hybrid?! That Works Too!

There are many different modalities to learning, especially as we have learned in recent years; and to that point, Finch Robot fits very well with a hybrid or virtual environment. All coding platforms from Block to Python are accessed through a “web-based” portal, therefore, can be taught online or in person. Students can access the same online lessons and create their own experiences right from their own home.

In some cases, a school or teacher may be able to have individual students own or borrow their own Finch Robot, allowing the student to see the Finch in action in person. Alternatively, students may still submit code as an assignment and an educator can run a project on the classroom device. The options for a hybrid or virtual classroom are endless and each educator will best cater to their populations’ needs!

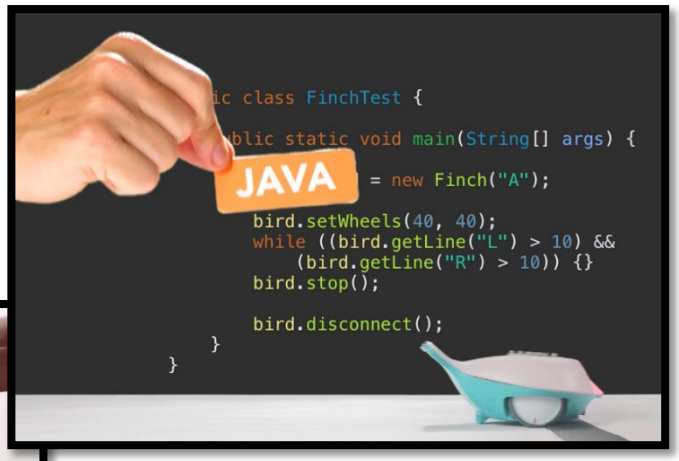


Sample BirdBrain Project Scoring Rubric

Category	High 5	Medium 3	Low 1	No credit 0
Programming of Finch	Program showcases variety of relevant Finch capabilities, like varying directions, stopping & going, & changing colors; Finch changes action at least 8 different times,	Program is straightforward and demonstrates most relevant Finch capabilities; Finch changes at least 6 different times	Program fails to showcase the Finch's relevant capabilities; Finch changes at least 4 different times,	Program very basic, or program not produced
Choreography /Movement	Programming of moves matches music precisely. Finch changes actions as music changes tempo or as lyrics/mood shift	Programming of moves attempts to--and mostly does--match music in tempo, lyrics, and/or mood	Programming exists and Finch moves, but does not sync movement with music	Finch did not move or did not appear to dance
Light Show	The lightshow is in sync with the music, uses fitting variation, and displays dramatic, meaningful effects	The lightshow is in sync with the music but does not show much variation or meaning	Some limited light features appear, but not in sync with the music	No light at all.
Costume and/or props	Costume/props clearly indicate the decade/style of performance	Costume/props attempt to indicate decade/style of performance	Minimal or irrelevant costume/props used	No costume/props used
Fulfillment of Requirements	Requirements met, including duration (45-60 seconds) & location (within 6x6)	Requirements mostly met; perhaps slightly over or under time, or Finch goes out of bounds	Requirements partly met, but time of show may be significantly shorter than required	Not met
Song Choice	Appropriate	N/A	N/A	Not appropriate

Daily accountability Log: 10 points
Reflection: 15 points

Total: 55 points



Websites/Learning Ideas/Resources

https://www.youtube.com/c/Birdbraintechnologies42/videos
BirdBrain Technologies (Finch) YouTube channel

https://www.birdbraintechnologies.com/products/finch-robot-2-0/
Finch - BirdBrain Technologies Homepage

https://www.replit.com
(Replit is web-based IDE used to type and run computer programs. Students can explore, learn, and code from tutorials, and educators can create team too!)

https://www.careeronestop.org/ExploreCareers/Assessments/interests.aspx
(Career exploration site which includes a 'career exploration' survey/assessment for all ages; to help determine where in the IT/STEAM world interests may be!)

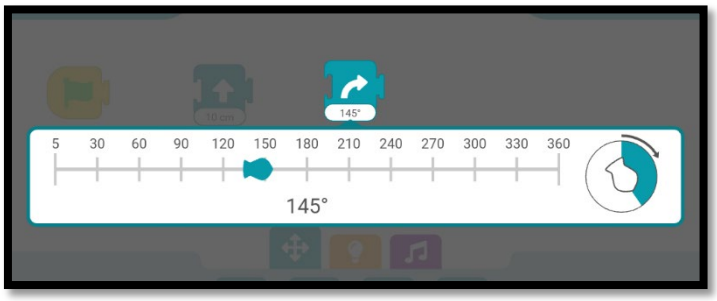
https://www.w3schools.com/python/
(Learn Python! You and your students can do it with easy to follow steps!

http://steam.dadeschools.net/#!/fullWidth/1860
(Is your school interested in getting a STEAM designation? It is a lot easier than you think! Check out this page for more!)

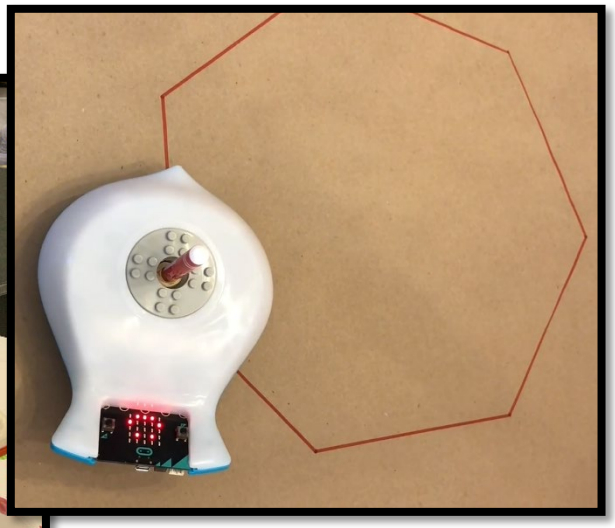
http://compute-it.toxicode.fr/
(A colorful take on understanding coding from a different type of perspective – a gaming mechanism as well!)

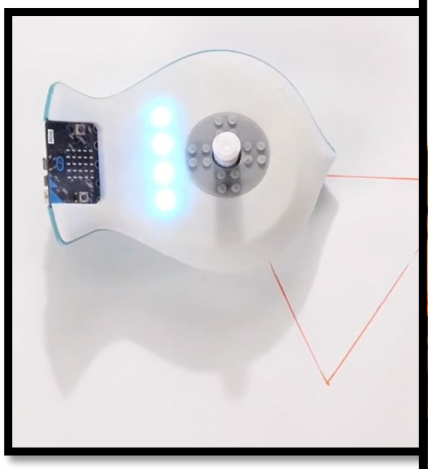
https://www.khanacademy.org/computing/hour-of-code/hour-of-code-lessons/hour-of-drawing-code/pp/project-self-portrait
(Student can create ART by using JAVA with Khan Academy's easy to use and script interface! Fantastic for all ages and levels!)

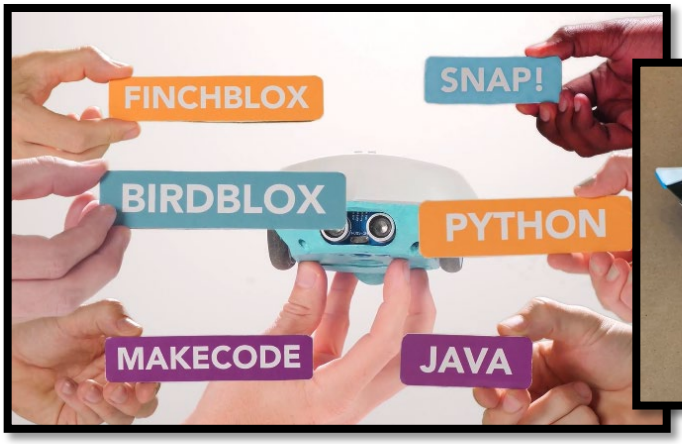
http://earsketch.gatech.edu/landing/#/
(Music and coding come together with this amazing resource from Georgia Technical Institute of Technology!)

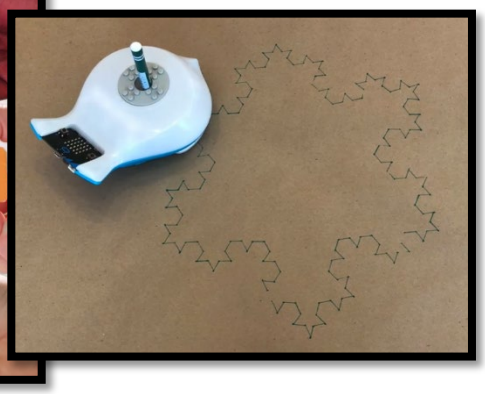


Project Kit Resource Samples









BirdBrain Technologies Mission Statement

To inspire deep and joyful learning in all students through creative robotics.

About BirdBrain Technologies

BirdBrain Technologies' products, the Finch Robot and the Hummingbird Robotics Kit, enable all teachers to cultivate creativity and computational thinking. Founded at Carnegie Mellon University in 2010, BirdBrain is a research-based company that promotes gender equality and diversity in computer science and robotics.

We aim to assist educators in bringing computer science and engineering design into any classroom using our free classroom-tested and standards-aligned learning materials. We also work collaboratively to support educators with our professional development to integrate robotics district-wide. Our products have been used by thousands of teachers around the world to bring creative robotics into the classroom!

We Believe That

1) Success is achieved not when we make a sale, but when:
a. Students have used our products in innovative ways, and
b. Teachers are supported to make our products their own.
2) Working with schools and teachers is the most equitable way to help the most students.
3) Students benefit most when classroom instruction emphasizes creative, non-routine work.
4) Educational products should be designed to be easy to start and should grow with students as they build their skills.
5) All students, regardless of background, have a right to learn in deep and joyful ways and make personally meaningful creations.

Please support and purchase BirdBrain products at: https://birdbraintechnologies.com
LinkedIn | Facebook | Twitter | Instagram

References/Credits: All BirdBrain Technologies components, images, likeness and lessons have been approved for use for this dissemination presentation with expressed consent by BirdBrain Technologies Labs, LLC.