

Creative Corner





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C O D E





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Some products and options may also become unavailable in which case, if I know I will delete the slide.









The Drivers

The convergence of:

- STEM Education
- The Maker Movement
- Digital Curricula
- Affordable Electronics
- The Internet of Things
- Crowdfunding
- Communities of Learners







he Internet













A Perfect Storm



Jackie Gerstein shares this great <u>Thinglink</u> on the Perfect Storm for Maker Education

"Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results."

John Dewey









Makedo











<u>Makedo</u> tools are designed for fast, simple and sturdy cardboard construction. Kids can choose from <u>a range of sets</u> or <u>Ready To Build</u> Kits. Teachers should check out the <u>Education</u> pages. Makedo is on <u>Vimeo</u>, <u>Facebook</u> and <u>Twitter</u>.



LittleBits









<u>LittleBits</u> uses colour-coded modular units which click together via magnets to learn about electronics and more. Of special interest are the <u>Cloudbit</u> and <u>Smart Home Kits</u>. LittleBits has special <u>education</u> <u>section</u> as well as <u>lessons plans</u> and a great <u>projects section</u>.















<u>SAM Labs</u> brings together a set of bluetooth capable wireless blocks and a drag and drop app to allow users to engage in coding, electronics and the Internet of Things. SAM Labs sells a range of kits including a Cloud Raspberry Pi block. They also have a great



Circuit Scribe











<u>Circuit Scribe</u> combines a conductive ink pen with which you can draw circuits and a <u>range of kits</u> containing a steel worksheet plus magnetic modules to complete the circuits. Make sure you sign up to use the <u>Circuit Scribe Sketch</u> online visual editor (check out the <u>movie</u>) as well



Makey Makey











<u>Makey-Makey</u> grew out of MIT and is styled as the Invention Kit for the 21st Century. It contains an arduino based circuit board, USB connector and alligator clipped wires. Makey Makey is one of the first mainstream computer interfaced Makerspace 'toys'. Find out more about Makey-Makey at Making With Makey Makey.



Bee-Bot and Blue-Bot











The <u>Bee-Bot robot</u> and the <u>Blue-Bot</u> are programmable floor robots. The see through Blue-Bot has more built in capability including the ability to turn in increments of 45 degrees as well as being able to perform repetitions in programs.



littlecodr







<u>Littlecodr</u> is a card game designed to introduce kids ages 4-8 or more to coding. It uses Action Cards to create a set of instructions, Mission Cards to work through and Lab Cards allow kids to expand on what they have learned.



Robot Turtles









Code Master Programming Logic Game











<u>ThinkFun Code Master Programming Logic Game</u> is a board game that teaches core programming concepts. On each level, players program an avatar to use conditional tokens to harvest power crystals and reach the destination portal via pathways.



Code Monkey Island Game











<u>Code Monkey Island</u> is a board game for ages 8 and up which introduces programming concepts such as control and data structures, Boolean logic and operators and more. It takes about a minute to learn the rules and 45 minutes to play.















<u>Osmo Coding</u> uses hands-on physical blocks to control Awbie, a playful character who loves delicious strawberries. Each block is a coding command that directs Awbie on a wondrous tree-shaking, strawberry-munching adventure.



Codeybot











<u>Codeybot</u> is an educational robot that teaches basic programming through an array of interactive features. Unlike many other robots, Codeybot connects via it's onboard wi-fi. Students can modify Codeybot's LED display and program a route, dance or adventure for it to take



LEGO WeDo 2.0













Ozobot





<u>Ozobot</u> is a tiny robot that uses a <u>color code language</u> to navigate game based activities. Ozobots use sensors to follow tracks which can be hand drawn or constructed using <u>apps</u>. The <u>OzoBlockly app</u> is a visual programming language for the robots. Ozobots come with sample tracks



Sphero











<u>Sphero</u> is a robotic ball that you control and program using your phone or tablet. Teachers can download the education focussed <u>Sprk</u> lessons. Learn more about Sphero at <u>On A Roll: A Little Robotic Code</u>. Also check out the <u>Tickle app</u>.



Edison



Meet Edison... ☑ Affordable ☑ Programmable ☑ LEGO® compatible

<u>Edison</u> is a very affordable robot which is Lego compatible, easy to program and has built-in programs that are activated by driving over <u>downloadable barcodes</u>. Edison has <u>lesson plans</u> linked to the Australian Curriculum and is programmable using <u>Free EdWare Graphical</u> programming software. See more at Edison: A Great Aussie 'Bot



Plum Geek Wink











<u>Wink</u> is an Arduino based robot designed to help transition students from graphical programming to more powerful written code languages. It's low cost and smarts are perfectly suited to STEM education and learning workshops. Check out the <u>educators section</u>.



mBot











The easy-to-assemble <u>mBot</u> is a neat Arduino based robot which can be programmed via the Scratch inspired mBlock application. The mBot can use an add-on Bluetooth or 2.4GHz wireless module. Teachers should check out the <u>Course Download Page</u>. Check out also the other Makeblock robots and options



Dash and Dot











<u>Dash & Dot</u> are a pair of programmable robots which combine play and learning for children ages 5+. Connecting via Bluetooth with built in sensors, users can program them via <u>Blockly</u> and <u>other apps</u>, (and later with Objective C and Java). Check out more at <u>Wonder Workshopping</u> With Dash and Det



Kamigami











<u>Kamigami</u> are programmable robots designed for children aged eight and up. They feature tool-free DIY construction, simple <u>iOS or Android</u> <u>app control</u>, and an array of sensors that let them work together or against one another.



TiddlyBot











Based on the Raspberry Pi, the <u>TiddlyBot Kit</u> adds robot powers such as movement, multi-colored lighting,line-drawing and following. This can be used to help learn and teach programming as well as for playing games. Great for schools and at home.









The <u>CoDrone</u> is a quadcopter that you program using Arduino. Check out the <u>CoDrone Community</u> for more information on how to program your drone.



Parrot Mini-Drones







<u>Parrot</u> offer a range of introductory mini-drones which are suitable for school settings because in addition to having a flight control app they can also be programmed using either Tickle or Tynker apps. Parrot has also recently established an <u>education portal</u>.



LightBlue Bean











<u>LightBlue Bean</u> is the original Bean Arduino microcontroller with a programmable Low Energy Bluetooth module which runs on a coin cell battery and is ideal for use as a long-term sensor or data logger. An updated version which addresses some issues in the movie above will <u>soon be available</u>.



Lilypad Arduino











The <u>LilyPad Arduino</u> is designed for e-textiles and wearables projects. It can be sewn to fabric and similarly mounted power supplies, sensors and actuators with conductive thread.



Hummingbird Duo





<u>Hummingbird Duo</u> from <u>BirdBrain Technologies</u>, (see the <u>full range</u>), introduces kids to robotics using everyday materials. The Duo can be programmed using Scratch as well as <u>Python</u>, <u>Java</u>, <u>Processing</u> and CMU CREATE<u>.</u> The DUO offers a <u>support materials</u> and you can register for a <u>free teacher's account</u> in order to access and share ideas.







Raspberry Pi







The <u>Raspberry Pi</u> is a series of credit card-sized single-board computers developed in the UK. The latest range includes the Raspberry Pi 3 and the budget Raspberry Pi Zero.Note the Raspberrry Pi requires peripherals to function including screens, keyboards, cables etc. You could also consider



Pine64











The <u>Pine 64</u> is a new low price option similar to Raspberry Pi. It is arguably more powerful than the Pi with a couple more options however deliveries are on back-order at present.















<u>Arduinos</u> are open-source hardware, software, and microcontroller-based kits that have been developed by a range of vendors. The boards are designed for building digital devices and interactive objects that can sense and control physical devices. Arduinos come in a <u>range of formats</u>.



Raspberry Pi vs Arduino vs Pine 64





This <u>article from Tech</u> <u>Times</u> provides a comparative look at the main features of Raspberry Pi, Arduino and the Pine 64.



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Tickle App











<u>Tickle</u> is a visual programming language very similar to Scratch which has an online version as well as an <u>iOS app</u> which can be used to program a range of popular devices. Check out more at <u>Can I Tickle Your Fancy</u>. See also the <u>Tynker app</u> as an alternative.



Please note my video above has not captured the whole screen and some icons referred to in the commentary



- <u>Kickstarter</u> is a crowdfunding space and source of some great products
- <u>Indiegogo</u> is another crowdsourcing space with a specific education section
- Edsurge is a community driven database of educational products
- <u>Graphite</u> from CommonSense Media provides reviews on a range of apps games and websites for the classroom
- <u>MakeEd</u> from <u>Make Magazine</u> aims to create opportunities for young people to learn through making
- <u>What's the Maker Movement and Why Should I Care?</u> Written by Gary Stager, (see also the companion book Invent To Learn)













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