



Introduction to Coding Using Ozobots and Scratch

What is coding?

Coding, in the simplest of terms, is telling a computer what you want it to do, which involves typing in step-by-step commands for the computer to follow. Computers are not clever, however, they are very obedient. They will do exactly what you want them to do, so long as you tell them how to do it correctly.

Learning to code has been likened to learning a foreign language, or perhaps more specifically a family of foreign languages. There are many different coding languages, each one designed with certain things in mind. Examples include C, a 'low level' but fast programming language that is good for anything graphically intensive like games; Javascript, which was specifically designed for dealing with web content; and Perl, a multi-functional language that is often referred to as the 'swiss army knife' of programming.

Why is coding important?

Code powers our digital world. Every website, smartphone app, computer program, calculator and even microwave relies on code in order to operate. This makes programmers who can code, the architects and builders of the digital age.

Over the next 10 years it is estimated that there will be 1.4 million jobs in computer sciences and only around 400,000 graduates qualified to do them. Jobs not directly linked to computer sciences - such as banking, medicine and journalism - will also be affected by the need for at least an understanding of programming and coding.

Choose an option to learn a little more about coding

Option 1: Visit the Code.org website to work through some of their tutorials or resources.

- Choose to work through a course at <https://studio.code.org/>. We suggest starting with course 2.
- Or choose a specific tutorial from the hour of code site. Here you can narrow down the choices by grade level, subject area, or technology tool. <https://code.org/learn>

Option 2: Visit bitsbox.com/go or bitsbox.com/hoc and walk through their online tutorials. Use the booklets we have here as resources.

- Learn how to build an app
- If you are ready, then build one of your own.



Ozobots

What are Ozobots?



They are small, smart and programmable robots that empower gamers and learners to code, play, and connect the physical and digital worlds. How do they work? They follow the colored patterns they roll over and each color combination tells them what to do, such as changing speed or direction.

Ozobots can be used with paper and markers or with apps that allow students to code them to dance and play.

Challenge:

- Start with the Brain Teasers Exercise. Fill in the blank spots with the proper code to complete the exercise.
- Using the Colonial America activity, see how Ozobots can be used in the classroom and applied to lessons.
- Try the Presidents activity
- Can you think of how you could use Ozobots in a lesson of your own? Create a path for the Ozobot to follow or share your idea with others

Additional Resources:

<http://ozobot.com/stem-education> <http://www.techlearning.com/blogentry/10525>

<https://www.commonsense.org/education/lesson-plans/mapping-with-ozobots>

<http://www.thelearningchambers.com/2016/10/how-to-integrate-ozobots-into-your-math.html>

<http://geteducative.weebly.com/ozobot.html>

<http://mspanasays.com/ozobot-engineers/>

<http://www.talkinpinata.com/blog/2016/6/5/5-ideas-for-implementing-ozobots>

<http://technology.rockingham.k12.va.us/showcase/ozobot-fun-and-fairy-tales-in-3rd-grade>

<http://www.ozoeasy.com/>



Scratch



Scratch is a free programming language and online community where you can create your own interactive stories, games, and animations.

How does this build pre-coding skills? Scratch is a kid-friendly way to learn programming. Rather than using anytax and semi-colons like in computer programming, you use graphical blocks to code in Scratch. A student writes code by snapping together blocks, much like LEGO bricks or pieces of a puzzle. Additionally, the blocks are designed to fit only in ways that make syntactic sense. This eliminates the dreaded syntax errors that often frustrate and discourage young computer programmers. To create a program, students drag-and-drop the blocks to create procedures.

Challenge:

- Take a few minutes to look through Meet>Hello Scratch, page 4, and Exploring Scratch, page 6.
- Try the tutorials that follow these introductory pages
- Complete the Ghost Hunt, page 18, Games Workbook
- Complete the Quizmaster ScratchCat, page 20, Projects Workbook
- How could you use this in your classroom? Take a few minutes to create an assignment for them.

Additional Resources:

<http://scratch.mit.edu>

<https://scratch.mit.edu/educators/>

<http://scratched.gse.harvard.edu/>

<http://edtechexperience.weebly.com/scratch-challenges.html>

<https://www.common sense.org/education/blog/how-to-use-scratch-for-digital-storytelling>

<http://www.scratchstuff.com/resources>

For young kids- there is an app for Scratch Jr. <https://www.scratchjr.org/>

<https://makelearn.org/2014/09/16/scratchjr-peel21st-blog-hop/>

<https://www.scratchjr.org/curricula/animatedgenres/full.pdf> <http://www.learninginspired.com/10-ways-to-use-scratch-jr-in-the-classroom>