

Bloxels

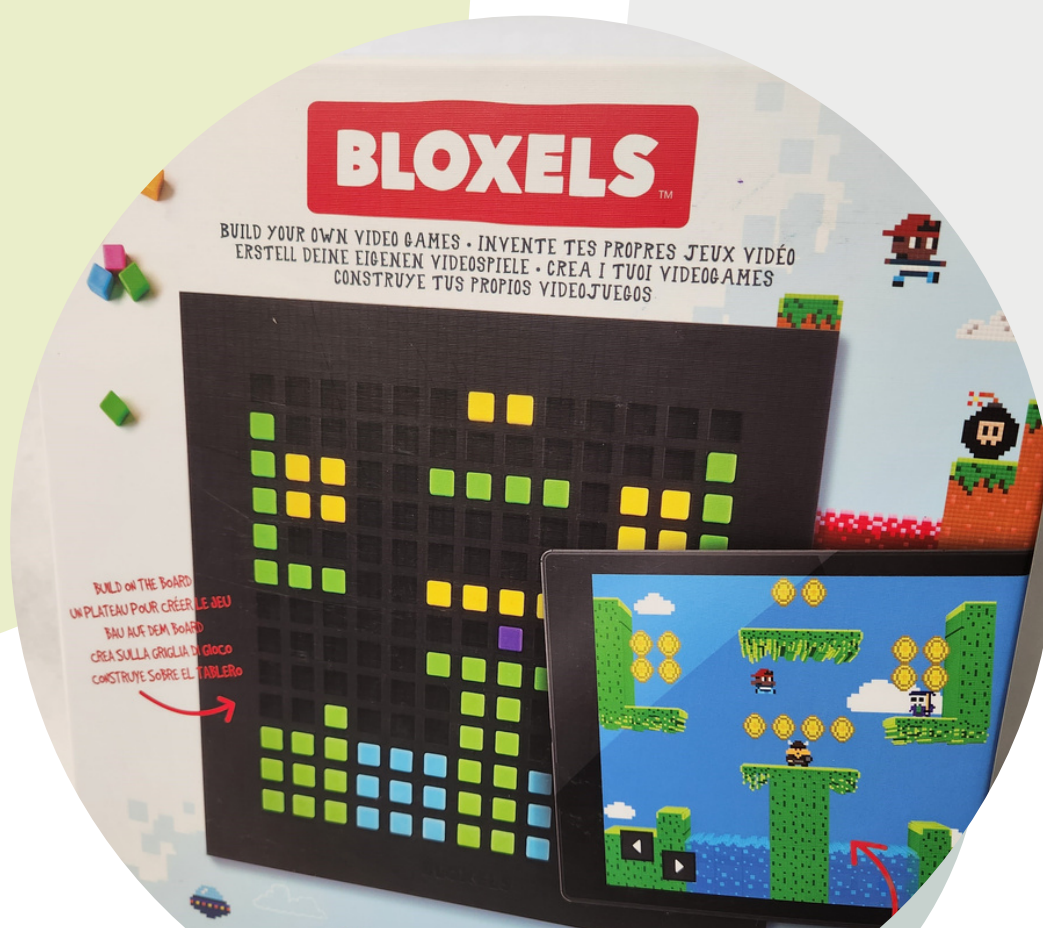
Difficulty Rating: Moderate

Overview: Bloxels is a lesson in programming disguised as a chance to play video games in school! Using the app on the iPads and the Bloxel blocks students can create their own side-scroller video games.

Number of Students: We have enough Bloxel kits for 12 students, however if the class is larger than that they could work cooperatively in pairs.

Example Lesson (time: 40 minutes): Using the included booklet, have students follow along with you and create the tutorial game together. After you've finished, let them play games others have made around the world via the app, or continue their projects to make their own unique games.

For a longer unit that could last a week, you can have the students work in groups as a game studio. Groups will need to plan out their hero, enemies, layout, and story as well as decide how to divide up the workload to meet their deadline. A good tie in for inspiration for their stories would be recent units from social studies or language arts.



Cubelets

Difficulty Rating: Easy

Overview:

Cubelets are cubes that you can combine together to make robots. The BLACK cubes are the Sense cubes, they allow the robot to detect outside stimuli such as sound, heat, and distance. Next, we have the WHITE Action cubes; these react to the stimuli detected by the Sense cubes and can spin, turn tires, make noise, produce light or display strength of a stimulus via LED lights.

Number of Students: 12-24 students. We have 6 kits total, each has 2 power cubes needed to make a robot work.

Introductory Lesson (time: 40-60 minutes):

- Introduce by asking students what makes a machine a robot? What things do robots need to function? A good thing to point out is that they will need the Power cube for whatever Cubelet creation they make
- Allow students to free play and explore. When a group discovers the Temperature Sense cube, call the attention of the class and ask them “would a cube that detects change in temperature be useful in a room temperature room?”
- Easy challenge: have students make a robot that drives doing a wheelie.
- Hard challenge: have students make a robot that can drive and steer without being touched. It needs to be able to go straight, right, and left without being touched by the operator.



Dash

Difficulty: Easy; Moderate for beginning readers

Overview: These robots will be zooming all over with the help of controls on our iPads. They can be programmed with drag and drop coding, allowing students to understand the basics of coding before diving into any specific language. They can also be used in a joystick mode for free play.

Number of Students: 12-48 students. We have 12 Dash Robots total which can be used in groups as large as 4.

Example Lesson (time: 46-60 minutes): Dash's driving school introduces students to drag and drop coding. Instructors can use SMART boards to demonstrate what students should be doing on their iPads. Younger students may need to do this lesson over a period of a couple days



Dot

Difficulty: Easy; Moderate for beginning readers

Overview: These Robots are programmed with drag and drop coding, allowing students to understand the basics of coding before diving into any specific language. They are exactly the same as Dash, but they are not mobile and perfect for classrooms in which zooming around robots would be hard to accommodate.



iPads

Description: 20 iPads in protective cases. We have many educational apps that can be used with without other technology. If there's a specific app you want installed we can look into accommodating that request. Additionally, the iPads are stored in a rolling suitcase that you can use during the duration of the loan.

Example Lesson:

Besides using the iPads for the apps you could also have the students conduct a scavenger hunt. You can do the standard "find this and take a picture" or have them find questions to answer and record videos of them giving the answers.



Lego Mindstorms Ev3

Difficulty: very challenging and requires intermediate coding skills to go beyond the tutorials.

Overview: Lego Mindstorms are Lego robot kits. There are tutorials and learning projects you can do, and once you have that figured out the sky really is the limit. These kits will need iPads for students to program the robots.

Number of Students: We have 10 kits that the students can use in groups of up to 4 students.

Sample lesson: Have the students work in groups to make the Lego rover. Once it is built, program the rover to navigate an obstacle course.



Ozobots Classroom Kit

Difficulty: Easy, but modifications may be needed for colorblind students.

Overview: Ozobots are walnut sized robots that can follow lines drawn with markers and can be given commands through color codes.

Number of Students: 18-36, we have 18 Ozobots and sets of markers; however, any brand of markers can be used as long as you have black, red, green and blue.

Example Lesson (time: 40-60 minutes):

Have the students create a course for their Ozobot. It must be a loop or rectangle that goes around the paper, leaving at least 1inch of paper between the line and edge of paper, and have a line that crosses the center. Students can use any codes they want, but the Ozobots are not allowed to cross that center line.

Students will most likely neglect to use the codes to give directions at intersections in favor of the cool moves. Ask for their attention and see which groups have success with their Ozobot never taking the center line. Highlight the importance of giving the Ozobot clear instructions and directions, then do our follow up activity of guiding the Ozobot through a maze.



Sphero

Difficulty: Moderate, accommodations will be needed for students who struggle with reading paragraphs.

Overview: Spheros are advanced robots with an array of sensors that allow students to program to a higher degree than the Dash and Dot robots. These clever orbs can do a lot!

Number of Students: up to 24, we have 6 Spheros that can be used with larger groups especially when doing precise movements that may need to be discussed and debated before initiated.

Sample Lesson (time: minimum 2 class periods): Have students work through the “Introduction to Sphero Edu” and learn how to use conditional formatting. Then when they have mastered that their final challenge will be the “Jurassic Code: Spheroraptor Escape”, in which they will need to program the Sphero to escape on its own out of an enclosure with just one entrance/exit. It sounds simple but students will be demonstrating all of their knowledge as their code will need to tell the Sphero to monitor if it is in motion, to change direction if not in motion, and to repeat that.

The Sphero lessons and activities have questions built into them, and you can track the students progress through the lessons and their score through the teacher portal. Part of the “Jurassic Code” is to submit their code to you for grading.



Turing Tumble

Difficulty Rating: Moderate

Overview: Turing Tumble teaches computer logic to students and is also a fun puzzle game. Students will be given a required pattern of marbles the machine needs to produce, and a diagram of parts with spare parts. Students will need to figure out where to place the spare parts in order to get the desired output from the machine.

Number of Students: 15-45, there are 15 kits in total. Groups of 2 students per kit work best, but will work with 3.

Example Lesson (time: 40 minutes) using the provided book, you can have students spend several days working through the various puzzles. One class period is enough time to get an understanding of the concept, but several hours would be needed to let the students run through the entire game.



Makey Makey

Difficulty Rating: Easy

Overview:

Make game controllers, musical instruments, and countless inventions. Turn everyday objects like bananas into touchpads! Connect the world around you to your computer!

Number of Students: 12-24 students working singularly or in pairs

Introductory Lesson/Setup (time: 30 minutes)

We recommend using the "First Time Set Up! Banana Piano!" from Makey Makey's website as your first lesson to familiarize students with Makey Makey. There are plenty of amazing follow up lessons on their website.



Little Bits

Difficulty Rating: Moderate

Overview:

littleBits are easy-to-use electronic building blocks that snap together with magnets to make learning about circuitry and electronics exciting and engaging. Connect them together to create complex circuits in seconds.

Number of Students: 12-24 students working singularly or in pairs

Introductory Lesson (time: 60 minutes)

This lesson provides a structured way to introduce littleBits to your students. They will start by exploring Bit Basics. Once they've built their understanding of these core ideas they will engage in short rounds of mini-challenges to explore all their Bits, gain confidence, and spark their imagination.



Osmo

Difficulty Rating: Easy

Overview:

Osmo kits turn a simple iPad into an augmented reality station. Each “genius” kit includes letter pieces, number pieces, and tangrams. Each Pizza Co. kit includes all the pieces needed to play the Osmo Pizza Co. game.

Number of Students: Osmo Genius; 14-28 students working singularly or in pairs Osmo Pizza Co.; 5-15 students working singularly or in groups of up to 3.

Introductory Lesson (time: 30 minutes)

1. Have your students start the “Introduction to Tangram” game. It will lead them through 13 puzzles starting with 2 shapes and ending with 6 shapes. Go around asking students to identify the shapes and colors.
2. Then play “Tangram” on easy. Students will journey the Tangram world by solving animal puzzles.
3. Throughout the lesson, ask students to identify shapes, colors, and the bigger shapes that 2 smaller shapes come together to create. Look out for the orange parallelogram - the trickiest shape!

