Curriculum: Roll the Dice

Original Rendition of a Classic

Language: JavaScript	**https://goo.gl/ 11bR4s**
Cross-Curricular Ties: Math	
Age Range: 12–18	
Duration: 30–60 minutes	
Scan the QR Code to see an example of what your students will make.	

Overview

Dice games are classics when it comes to having fun with your family, but they are also classics when it comes to introducing computer science! Programming dice can be a great way to get a huge impact with minimal coding. This is one of the reasons that dice lessons make their way into almost all entry-level coding classes. Here, we provide a small twist on one of our favorites.

Lesson Objectives

- Learn to read basic JavaScript
- Use random numbers to simulate dice
- Identify mathematical techniques in existing code
- Use the Web to teach themselves additional JavaScript commands

Materials and Resources

- Paper
- Pens or pencils
- Dice (up to 3)
- Computer with internet

Preparation

Play a quick guessing game with your students.

- Ask students to predict what number you are going to roll on a die.
- Roll the die.
- Ask whether it was the number that they predicted.
- How did you know it wouldn't be a 0? How about a 10?
    - Six-sided dice have a known minimum and maximum number.
- How could I roll a 10?
    - Roll more than one die.

Tell students that they will be building their own dice game on the computer. Using a few lines of JavaScript, students will simulate having their computer roll dice, then alert them as to what they rolled. Here's the catch: Students will be teaching themselves!

Guide students to the "Roll the Dice" project page located at https://goo.gl/btu63T. This will give them all that they need to investigate their way through their first steps at coding. It will even guide them to JSFiddle.net, which is an all-in-one online coding platform that will let them write JavaScript immediately.

Activity

Turn students loose with their first JSFiddle program, located at https://jsfiddle.net/ya8srgar. This, combined with their guiding Google Doc will give them all they need to play around for the day. Their programs have some great comments and examples to help illustrate what they're supposed to be doing.

Once they move on to the second program, at https://jsfiddle.net/xqxznb2m, they will have blanks where they need to copy what already exists into a new context. This is great for helping them branch out and try some coding on their own.

Finally, they'll fork off their own program and choose three challenges from the provided Google Doc. Giving them the freedom of choice will allow them more ownership over their education, as will turning them loose to find the answers using a search engine. There's no shame in finding examples of others solving problems that you're working on in the early stages of coding . . . or the late stages, for that matter!

For your convenience, samples of the JavaScript exercise have been provided at the end of this lesson.

Wrap Up

JavaScript is a fantastic language for writing applications for any platform. Whether on a Mac, PC, or a smartphone, practically anyone can pull up a JavaScript site.

This exercise was meant to illustrate the exploratory nature of programming. Often, you'll need a little kickstart, but if you're brave enough to venture out on your own and try new things, you can discover quite a lot without formal teaching. This is *vital* to the world of computer science.

Have a discussion around this idea with your class. Here are some other questions to prompt their thinking:

- How did you feel when you first saw the code?
- Did it help to go through everything line by line?
- Were you tempted to look up other coding concepts to make your program do something new?
- What were you most afraid of?
- Were you able to get over that fear?

What It’s All About

Computer science is all about learning to learn. Don’t be afraid to make your class struggle. Just be sure to be open and honest about the frustration that comes with learning something new, and help them understand that at some point, this is hard for everyone!

Code From Doc

https://jsfiddle.net/ya8srgar

```
// This is a comment. The computer doesn’t run it, but humans can read it.
// Use comments to describe what you are about to do
// Let’s use a *variable* to set the minimum number on our die to 1
var myMin = 1;
// Now we need to set the max to 6 for a 6-sided die
var myMax = 6;
// Time to program the first die using random numbers
// (random is already in the Javascript library)
var die1 = Math.floor(Math.random()* myMax + myMin);
// Now we add the command to shout out the number we rolled.
alert(“You rolled the number “+ die1);
```

- How do you think you run the program given in the window?
- How would you fork off your own version to play with?
- Try going through the code line by line to see if you can figure out what everything does.
- Can you change the min and max to make your own custom die?
- How might you save or update your program to keep your changes?

Curriculum: Roll the Dice

https://jsfiddle.net/xqxznb2m

```
// This is a comment. The computer doesn’t run it, but humans can read it.
// Use comments to describe what you are about to do
// Let’s use a *variable* to set the minimum number on our die to 1
var myMin = 1;
// Set a new max so we can roll a 12-sided die
var myMax = 6;
// Time to program the first die using random numbers
// (random is already in the Javascript library)
var die1 = Math.floor(Math.random()* myMax + myMin);
// Let’s add a second die using the same min & max
var die2 = ;
// Can you add a third die with the same parameters (min & max)?
// Now add all of the dice to the alert.
alert(“You rolled the number “+ die1 + “ and a “ + die2);
```

- Don’t forget to fork off a copy.
- Can you finish adding die2 to the program?
- Can you add all of the code for the variable die3?
- How can you get them to show up in the alert?