

Coding in JavaScript with Intel and CoderDojo

A guide to delivery



Introduction

This project is the third of three that have been produced to help you, and your students, master coding in HTML5, CSS and JavaScript. Each project is presented as a challenge – Intel and CoderDojo have provided code for a Piano App that has bugs in it. The task is to fix the bugs and turn the app into a game.

By the end of this third module, students will have sufficient knowledge of JavaScript to add a gaming function to the provided piano app. The code is provided, alongside two video tutorials that show firstly how to add a tune to the piano app, and then create a scoring mechanism that awards the user a score for correctly playing the tune. Students can also gain a Gamification Open Badge for demonstrating their understanding of the changes to the code to add the scoring features and tunes to the app.

We have produced an e-learning module that has a set of video tutorials provided by Intel's Steve Cutler that demonstrate how to use JavaScript, building interactive features along the way including user input fields and buttons, a balloon that inflates and bursts as the user clicks, and a simple calculator.

By the end of the e-learning module, students will have learned enough JavaScript to add interactive features to their web page. They will also have the skills to gamify the piano app with the scoring facility.

Using the Student Log with this project

Students are provided with a Student Log that can be completed with example screenshots of completed code as they work through the e-learning module. There is an exemplar copy of this log available for assessment purposes with screenshots of the correct code – if you would like a copy, email helpdesk@techfuture.com.

Earning Open Badges for work on this project

The Tech Partnership Badge Academy is directly aligned to the TechFuture Classroom. You can find the Badge Academy by clicking on the Badges link at the top of the Learning Hub window.

Within each TechFuture Classroom project, there are between 2 and 6 badges available for students to earn for the work they complete within the projects. In this JavaScript project, there are three available badges:



JavaScript Coder – students receive this badge for working through the e-learning module and reaching the end. This badge is automatically verified ¹– the platform recognises when the student has completed the module.

Gamification – students receive this badge for working through the associated e-learning module (JavaScript Gamification Open Badge) and achieving a pass mark. This badge is automatically verified.

Dynamic Web Developer – students receive this badge for creating a webpage with examples of JavaScript coded dynamic features. This badge is awarded when teachers verify completion of this task. If you wish your students to attempt this badge, we will provide you with the code the student needs to insert into the platform to gain the badge. **Email** helpdesk@techfuture.com **to receive the code**. *Note, this code is changed monthly to ensure students are not sharing the code between them!* The criteria that students need to meet to gain this badge are shown at the end of this document.

Resources provided

On the course page, there is a bank of resources underneath the e-learning modules that scroll using the arrows at each end of the row. As the use of JavaScript syntax is complex, each activity that Steve introduces has its own guide for download.

You are provided with the following resources:

- > The e-learning module which students can work through individually in the classroom or at home
- > Downloadable code for the Piano App
- > A guide to downloading and using the code
- > Two videos by Steve Cutler showing students how to add a tune and a scoring mechanism to the Piano App
- > Student Log in both MS Word and PDF versions
- > Guide to capturing user input in JavaScript
- > Guide to changing HTML elements in JavaScript
- > Guide to coding a button in JavaScript
- > Guide to using the 'for' loop in JavaScript
- > Guide to using the 'while' loop in JavaScript
- > Guide to the 'if' conditional in JavaScript
- > Guide to further use of the 'if' conditional
- > Guide to passing parameters to functions in JavaScript
- > Guide to coding a calculator in JavaScript
- > Guide to using JavaScript objects
- > Guide to creating objects in JavaScript
- > Zipped file of images for the balloon activity (changing HTML elements)
- > Zipped file of code for the passing parameters activity and for the cars activity (JavaScript objects)

¹ Badges with a red icon are verified automatically by the platform for completion of e-learning.



Steps in the e-learning content

The following table shows the steps in the e-learning and the JavaScript syntax introduced. Additional resources, including some code and images to use in activities are also listed.

| Steps in the e-learning content | Resources |
|---|---|
| Coding a button with JavaScript | Guide to coding a button |
| Using JavaScript to get user input | Capturing user input in JavaScript |
| Using JavaScript to do simple mathematics | Coding a calculator in JavaScript |
| The 'if' conditional in JavaScript | Guide to the 'if' conditional in JavaScript |
| Further use of conditional | Further use of the 'if' conditional |
| The 'while' loop in JavaScript | Guide to using the 'while' loop in JavaScript |
| The 'for' loop in JavaScript | Guide to using the 'for' loop in JavaScript |
| Passing parameters to functions in JavaScript | Guide to passing parameters to functions in JavaScript Code for this activity |
| Changing HTML elements from JavaScript | Guide to changing HTML elements in JavaScript Balloon and bang image for this activity |
| JavaScript Objects | Guide to JavaScript objects Code for this activity |
| Creating your own JavaScript objects | Guide to creating your own JavaScript objects |

Timings for delivery

TechFuture Classroom projects are built for flexibility and different ways of use.

Students can work through the e-learning, with Notepad++ open, completing each coding activity and taking the required screenshots and adding them to the Student Log as they progress. It is likely that this method of delivery will take a minimum of three (50 minute) lessons for completion, including some homework tasks.

Students could also work through the e-learning without building the code, just gaining knowledge of the way JavaScript works, and how to use the syntax to apply styles to a webpage, without using Notepad++. Whilst we do not recommend this way of delivery, it would reduce significantly the time needed for this project to be completed. Students could complete the e-learning this way in one lesson, with homework. They would also be able to gain the **JavaScript Coder badge**.

Adding a tune and the scoring function to the Piano App (and to earn the **Gamification badge**) would take at least another lesson.

For keen students, they can add dynamic features to their own website (and earn the **Dynamic Web Developer badge**) which could be a homework task or project. You would be required to verify their completed website against the criteria below to award this badge, giving successful students the code to upload to the platform to gain the badge.



Note, for individual award of badges, students must be logged into their own account.

Flipped classroom delivery

It is possible to use TechFuture Classroom projects for flipped classroom delivery. When students have their login details, they can access the platform at any time from home and school. Students could complete the e-learning at home, and apply their new knowledge of JavaScript in the classroom. All that would be required in class would be Notepad++ to build the code.

Criteria for the Dynamic Web Developer Badge

To gain the Dynamic Web Developer Badge, you will have seen a student use JavaScript to add dynamic features to a webpage. Evidence for this badge is the presence of **one of the following** dynamic features:

- 1 Inflating and popping balloon (changing HTML elements)
- 2 User input field and button that generates a message for the user
- 3 A working calculator

When a student completes this task and you are happy with the quality of work, you can issue the code for the student to enter into the platform for badge awarding.

If you have questions or queries about this project, contact helpdesk@techfuture.com and we will do our best to respond within 48 hours.