Intro to JavaScript Changelog

What's new? What's changed? This document lists granular changes to the Intro to JavaScript course along with some rationales on why these decisions were made.

General Course Changes: Blog with More Information

- ES6 Update: `let` and `const` are used in place of `var`
- `console.log()` is used instead of `println()`
- The `start()` function is replaced by a `main()` function that students must create AND call.
- For graphics, strings are used instead of objects. For example, `setColor("purple")` is used instead of `setColor(Color.purple)`.
- All slides and recordings have been updated.
- Activity descriptions and solutions have been updated for clarity and consistency.

Module 1: Programming with Karel

Structural changes:

- The lesson *How to Indent Your Code* has been moved to before *Control Structure Examples*. This is when students learn about indentation (a structure that requires nested code, etc).

Significant changes:

- The lesson *The Start Function* has been replaced with one called *The Main Function*. The `start()` function has been replaced with a `main()` function. Students should use the `main()` function and then call the function in order to run the program.
- In the new *The Main Function* slidedeck, the instruction moves away from a story analogy to be more technical and explicit in the introduction of the main function.
- The *streets* and *avenues* terminology is not used. This was confusing to teachers and students and has been replaced with *columns* and *rows*.

Module 2: Karel Challenges

No changes in this module.

Module 3: Javascript Basics

Structural changes:

- The *Random Numbers* lesson has been moved from the Control Structures module into this one. This way students can use random numbers in more of their programs.

- A *Basic Functions* lesson was added to this module. If students did not go through the Karel module (some teachers drop it) then they would not know what a function was, and we felt it was important for students to understand functions earlier in the course.
- The *Collaborative Programming* lesson was moved from the Graphics Challenges module to this module to give it better visibility within the course.

Significant changes:

- Graphics content has been separated from this module. This module was named *JavaScript and Graphics* and is now named *JavaScript Basics.* The graphics material will come after this module.

Smaller changes:

- The *Hello World* slidedeck was only live coding. Added conceptual slides for this lesson.
- The *Variables* slidedeck now explicitly teaches string concatenation.
- New Activities:
    - ASCII Animals
    - Debugging Variables
    - Mad Libs
    - Treasure Chest Loot
    - Multiplication Practice
- Activities that were moved to extra practice in supplemental:
    - Flipping a Coin
    - Random Color Square

Module 4: The Canvas and Graphics

This is a new module that takes a slower, more methodological approach to teaching students how to use the canvas and graphics in JavaScript. Each new lesson contains at least one exercise that allows for student choice. Especially with graphics, this allows for student creativity!

New Lessons:

- Intro to the Canvas and Graphics
    - In this lesson, students will learn about the graphics canvas and its coordinate system. Students will explore how to create and position shapes anywhere on the canvas. Graphic creation relies on setting the type of shape, size, position, and color on the artist's canvas before adding it to the screen.

- More Graphics Objects
    - In this lesson, students will get more practice with graphics objects. They will also learn how to find images on the internet and use them in their projects. Students will also learn how to add text objects and lines to their canvas.

- Positioning Graphics Objects
    - In this lesson, students will further explore the positioning of their graphics.

Module 5: Graphics Challenges

Structural changes:

- The *Collaborative Programming* lesson was moved out of this module to give it better visibility within the course.

Module 6: Control Structures

There was a lot of teacher feedback requesting stronger scaffolding for this module. This module has been updated to include more basic activities that lead to the more challenging ones.

Structural changes:

- The *If/Else Statements* lesson was moved to after the *Booleans* lesson so that the *Logical Operators* and *Comparison Operators* lessons could be taught within the context of if/else statements. This enables students to immediately use logical operators and comparison operators within a conditional rather than assigning the boolean expression to a variable.
- The *While Loops* lesson is taught before the *For Loops* lesson to provide continued practice using boolean expressions.
- The *For Loops in Javascript*, *General For Loops*, and *For Loops Practice* lessons have been condensed in a new *For Loops* lesson and a new *For Loops with Graphics* lesson.
- The *Random Numbers* lesson has been moved from this module into the JavaScript Basics one.

Significant changes:

- There are three new lessons that have students apply their knowledge of control structures with JavaScript graphics:
    - Graphics and Conditionals
    - While Loops and Graphics
    - For Loops and Graphics
- The “loop and a half” terminology is not stressed as much. The focus of this concept now lies on break statements and how/when to use them.

Smaller changes:

- New Activities by Lesson:
    - Booleans
        - Booleans are Questions
        - Best Day Ever
    - If/Else Statements
        - Are you logged in?
        - Is it raining?
        - Mood Playlist

                - These are all new activities. These activities are simpler in nature since they now come before Comparison Operators. Many of the activities in the original If Statements lesson have been moved to the Comparison Operators lesson.
    - Logical Operators
        - Harry Potter
        - Weak Password
            - This has replaced the Wasting Time exercise, which was outdated.
        - Logical Operators Game
        - Switching Players
        - A Day of Decisions
            - This activity has replaced the School's Out exercise.
    - Comparison Operators
        - Trivia Game
    - While Loops
        - Debugging
        - Level Up
            - This has replaced the Fibonacci exercise.
    - The Break Statement
        - Break Statement Reflection
        - Riddle Machine
    - For Loops
        - Eating Apples
        - Lives Left
            - This has replaced the Better Sum exercise.
        - Jukebox
            - This has replaced the Factorial and All Dice Values exercise.
- Activities that were moved to extra practice in supplemental:
    - These exercises were very math-heavy and replaced by more varied prompts:
        - Better Sum
        - Factorial
        - Powers of Two
        - All Dice Values

Module 7: Control Structures Challenges

Significant changes:

- New Challenge - Landscape Generator
- New Challenge - Exploring RGB Color Codes
- Activities that were moved to extra practice in supplemental:
    - Circles in Circles
        - This challenge ended up being too simple since we added additional graphics lessons into the control structures module.
    - Circles in Squares
        - While visually very cool, this challenge required students to do some complex math (that was given to them in the description), so we replaced it with a non-math challenge.
    - Happy Birthday!

        - This challenge was more focused on graphics than on control structures, so we replaced it with a challenge whose primary focus was control structures.

Module 8: Functions

Structural changes:

- Previously, there were three lessons on *Functions and Parameters* and two lessons on *Functions and Return* values. These activities have been regrouped and reorganized into one *Parameters* lesson, one *Return Values* lesson, and an additional *Default Parameters* lesson. These lessons are able to be condensed since functions are introduced much earlier in this new course.

Significant changes:

- Default Parameters
- Variable Scopes

Smaller changes:

- New Activities by Lesson:
    - Parameters
        - Slope of a Line
            - This has replaced the Double Number example.
        - Draw Lots of Circles!
            - This has replaced the Square example.
        - Rainbow Revisited
            - This has replaced the Triple example and is a chance for students to improve upon a program they wrote earlier.
    - Return Values
        - Mathematical Returns
            - This has replaced the Double Number example.
        - Offscreen Graphics
            - This is for additional graphics practice.
        - Overlapping Graphics
    - Default Parameter Values
        - Default Printing
        - Farming International
        - Compound Interest
        - Default Face
    - Variable Scopes
        - Scope of X
        - Exploration: Scope of Ball
        - Scope Reflection
        - Choose Wisely Game

- Activities that were moved to extra practice in supplemental:

    - Since functions are introduced earlier in the course, we could condense past lessons and introduce new activities. Also taking into consideration teacher feedback, we decided to keep Area of a Triangle and Cityscape instead of the following:
        - Height in Meters
        - Vertical Lines
        - Graphics Stop Light
        - Pool Table
    - These simple and math-focused activities were replaced by more varied activities that demonstrate the power of student-defined functions:
        - Square with Return Values
        - Triple with Return Values
        - Gymnastics Mats
        - Return Values
    - The content in these activities is now covered by the new activities in Variable Scopes:
        - Return Values
        - Local Variables

Module 9: Function Challenges

Significant changes:

- New Challenge - Global Travel Assistant
    - Incorporates more practice with parameters, multiple functions, and return values.
- Activities that were moved to extra practice in supplemental:
    - Hailstone Sequence
    - Grades

Module 10: Animation and Games

Structural changes:

- Lessons have been merged and reorganized to better classify what students are learning, such as timers, collisions, and events.

Significant changes:

- New Through Project - Evasion
    - We took the spirit of the bouncing ball example that was in multiple Golden lessons and turned it into a project that students will work on throughout the module. They will demonstrate all of the animation and interaction skills introduced in the module.

Smaller changes:

- New Activities by Lesson:
    - Timers
        - Paint Splatter
            - Moved from old Random Circles and updated

        - Project: Evasion (Timers)
        - Project Info and Links
    - Stopping Timers
        - Growing Circle and Brick Wall
            - Moved from old lessons and updated
        - Project: Evasion (Stop Timers)
    - Collisions
        - Collision Simulation
            - Moved from Mouse Clicked and updated
        - Carnival Game
        - Project: Evasion (Collisions)
    - Mouse Click Events
        - Pausing the Carnival Game
        - Dripping Paint
        - Project: Evasion (Mouse Click)
    - More Mouse Events
        - Drag and Drop
            - Moved from Crazy Ball and updated to include WebImages
        - Project: Evasion (More Mouse Events)
    - Key Events
        - Keyboard Character
            - Replaces Keyboard Square
        - Project: Evasion (Key Events)
        - Project Reflection
- Activities that were moved to extra practice in supplemental:
    - These were removed in favor of different types of activities. Ghost activities also revealed the solution code to prior Ghost activities in the course:
        - Random Ghosts
        - Random Fireworks
        - Circle Wall
        - Click for Ghosts
    - These bouncing ball activities were replaced by Project: Evasion:
        - Hotspot Ball
        - Pause
        - Crazy Ball Game
        - Trail
        - Teleporting Ball
    - We removed these activities from the course in favor of Project: Evasion. We also thought these would fit better in supplemental as additional practice:
        - Drawing Lines
        - Leash

Module 11: Animation Challenges

No changes in this module.

Module 12: Project: Breakout

Project Introduction Note added.

Module 13: Final Project

Project Introduction Note added.