SpaceAdventure
Lesson 1

Description

Declare Swift constants, and print string literals with `println`.

```
Welcome to our solar system!
There are 8 planets to explore.
You are currently on Earth, which has a circumference of 24859.82 miles.
```

Learning Outcomes

- Recognize the main.swift file in a Swift Xcode project, and describe **main.swift** as the starting point for a Swift program.
- Apply string literals, string interpolation and `println` to produce console output.
- Write variable and constant initializations with Swift.

Vocabulary

project	Swift	main.swift
string literal	`println`	function call
console	variable	declaration
initialization	data type	identifier
type annotation	`var`	string interpolation
constant	`let`	

Materials

- **SpaceAdventure Lesson 1** Xcode project

Opening

What programming language do we use to create iOS apps?

Agenda

- Using the Project Navigator (⌘1), open **main.swift**.
- Discuss how Swift programs generally contain a **main.swift** file, which contains code for the starting point, or "main entry point," of a Swift program.
- Explain the call of the `println` function, function call syntax, passing arguments to functions between parenthesis, the purpose of `println`, and Swift string literals with "".
- Run the program (⌘R), and observe the console (⇧⌘C) to see the program's output.
- Declare two variables.

```
var numberOfPlanets: Int = 8
var diameterOfEarth: Float = 24859.82 // In miles, from pole to pole.
```

- Explain Swift variable declaration and initialization, type annotations, and literals such as numbers.
- Explain how Swift single-line comments begin with `//`.
- Remove the printing of `Hello World!` and add some of your own `println` calls below the variable declarations.

```
println("Welcome to our solar system!")
println("There are \(numberOfPlanets) planets to explore.")
println("You are currently on Earth, which has a circumference of
   \(diameterOfEarth) miles.")
```

- Discuss Swift string interpolation.
- Run the program (⌘R), and observe the console (⇧⌘C) output.
- Explain how type annotations are not mandatory in Swift, and how Swift can infer the data type of variables by inspecting the kinds of values assigned to them during initialization.
- Remove the type annotations from the two variable declarations.

```
var numberOfPlanets = 8
var diameterOfEarth = 24859.82 // In miles, from pole to pole.
```

- Run the program (⌘R), and observe how the program works the same.
- Discuss how the values of `numberOfPlanets` and `diameterOfEarth` do not change while the program is running.

- Explain how Swift differentiates between variables and constants with the keywords `var` and `let`.
- Change the variable declarations to constant declarations.

```
let numberOfPlanets = 8
let diameterOfEarth = 24859.82 // In miles, from pole to pole.
```

- Run the program (⌘R), and observe how the program works the same.
- Discuss the Swift best practice of declaring constants with `let` rather than `var`, and encourage students to "always start with `let`."

Closing

What similarities do you see between these few lines of Swift and another language that you know?

Modifications and Extensions

- Investigate the similarities and differences between `Int`, `Float`, `Double` and `CGFloat`.
- Extract the `println` calls into a function that accepts an `Int` and `Double` parameter, and prints the messages on the screen.

Resources

The Swift Programming Language: About Swift https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/

The Swift Programming Language: A Swift Tour https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/GuidedTour.html

The Swift Programming Language: The Basics https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/TheBasics.html

Swift Blog: Files and Initialization https://developer.apple.com/swift/blog/?id=7

Swift Standard Library Reference: Printing https://developer.apple.com/library/ios/documentation/General/Reference/SwiftStandardLibraryReference/Printing.html

The Swift Programming Language: Type Safety and Type Inference https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/TheBasics.html#//apple_ref/doc/uid/TP40014097-CH5-ID322

The Swift Programming Language: Types https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/Types.html