Objects

# Part1

School data structure diagram (this year, last year)

Problems with that (lots of parameters, what if we want to add elementary grades)

Introduce an object, properties, as a way of grouping a set of variables

Updated school diagram

Explanation of a reference type (“won’t fit in the box”)

How to write an object

Copy/paste our school example

Change it to use objects

Search and replace tutorial

Step it and see the result

# Part2

Add a teacher count

Add a function to calculate teacher/student ratio

# Lesson Notes

## Looking at our school example

* All we see a bunch of numbers. It is not clear what they are for.
* There is really a concept here: a school object. We want to be able to group related things together.
* This is one of the big things we do in computer science. We come up with a data model for some real-world thing that we care about.

## Objects in Javascript

* An object has one or more properties
* Each property has a name and a value
* Our object can be the school
* Our properties can be the number of students in each grade

## How to write an object

* Syntax for an object
* Syntax for accessing a property
* Updated example

## Objects represent a group of variables in memory

* The variables are grouped together
* We have a “reference” to those variables
* When we pass these to a function, we are passing the reference
* This means that functions can read the memory, and write the memory
* Visual for this (reference diagram)

## Exercise

* Update your example to use a school object

## Exercise

* Add a teacher count to your object
* Add a function that calculates the ratio of students to teachers for the school
* Check result

## Returning objects

* Objects can also be used to return more than one value
* Example: return sum and average

## Exercise:

* Create a function that uses the existing functions to return an object with all the statistics we have so far for a school:
  + Total students
  + Average for upper school
  + Teacher ratio

## Types of values so far

* Three data types (types of values):
  + Functions
  + Numbers
  + Objects
* Objects vs. Objects
* Undefined
* Null