Chapter 12

Objects and the Math Object

Chapter Breakdown
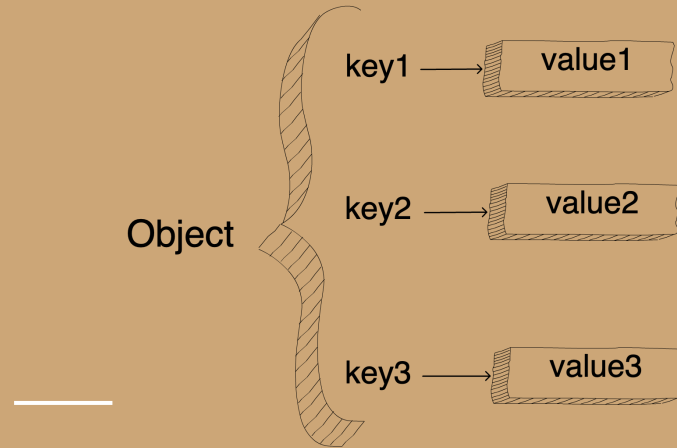
12.1 Objects and Why they Matter

Objects!

Data Structure
Can hold many values
Utilizes Key/Value Pairs

Objects require 3 things

1. A name
2. A set of keys
3. Values for the keys

Methods and Properties

Property of an object:

- Another name for the key/value pair
- Property's name is the key
- Property's value is the data assigned to the key

Methods of an object:

- Perform an action on the object
- They are a property that store functions
  - Ex:

```
sign: function() {
    return this.name + " is a " + this.species;
}
```

12.2 Working with Objects

Working with Objects

Bracket Syntax
Dot Notation
Add New Key/Value pairs

Bracket Notation:

- You can access a property value by using object['key']

Dot Notation:

- You can access a property value by using object.key

Adding and modifying Properties

- Modify using bracket or dot notation
  - object["key"] or object.key = newValue
- Add using bracket or dot notation
  - Object["key"] or object.key = newValue

12.3 Coding With Objects

Coding With Objects

Booleans and Objects
Iterating through Objects
Objects and Functions

Objects passed by reference

- If you have two objects and do a comparison then they will equate to false
  - This is because objects are not stored by their properties or values!

Iterating Through Objects

- Uses a for …. in loop.
  - for(item in object)
  - Item is a variable that holds the string for each key
  - Get the value by passing item into the object (object[item])

Objects and Functions

- Can pass an object as the input of a function
- Can use an object as a return value of a function

12.4 The Math Object

The Math Object

Properties are Constants
Has 8 defined properties
Immutable

Property	Description
E	Returns Euler's number (approx. 2.718)
LN2	Returns the natural logarithm of 2 (approx. 0.693)
LN10	Returns the natural logarithm of 10 (approx. 2.302)
LOG2E	Returns the base-2 logarithm of E (approx. 1.442)
LOG10E	Returns the base-10 logarithm of E (approx. 0.434)
PI	Returns PI (approx. 3.14)
SQRT1_2	Returns the square root of 1/2 (approx. 0.707)
SQRT2	Returns the square root of 2 (approx. 1.414)

12.5 Math Methods

Math Methods

Math object contains over 30 methods

Ten Common Math Methods

Method	Syntax	Description
abs	`Math.abs(number)`	Returns the positive value of `number`.
ceil	`Math.ceil(number)`	Rounds the decimal `number` UP to the closest integer value.
floor	`Math.floor(number)`	Rounds the decimal `number` DOWN to the closest integer value.
max	`Math.max(x,y,z,...)`	Returns the largest value from a set of numbers.
min	`Math.min(x,y,z,...)`	Returns the smallest value from a set of numbers.
pow	`Math.pow(x,y)`	Returns the value of x raised to the power of y (x^y).
random	`Math.random()`	Returns a random decimal value between 0 and 1, NOT including 1.
round	`Math.round(number)`	Returns `number` rounded to the nearest integer value.
sqrt	`Math.sqrt(number)`	Returns the square root of `number`.
trunc	`Math.trunc(number)`	Removes any decimals and returns the integer part of `number`.

12.6 Combining Math Methods

Combining Math Methods

Random Selection From an Array

Rounding to Decimal Places

```
1    function randomSelection(arr){
2        let index = Math.floor(Math.random()*arr.length);
3        return arr[index];
4    }
5
6    let happiness = ['Hope','Joy','Peace','Love','Kindness','Puppies','Kittens','Tortoise'];
7
8    for (i=0; i < 8; i++){
9        console.log(randomSelection(happiness));
10   }
```

```
Tortoise
Love
Kindness
Hope
Kittens
Kindness
Love
Hope
```

Step	Description
Math.round(5.56789123*100)/100	Evaluate the numbers in () first: 5.56789123*100 = 556.789123
Math.round(556.789123)/100	Apply the round method to 556.789123
557/100	Perform the division 557/100 = 5.57

STUDIO TIME!!!!!!