Introduction to Programming

Class 4, 7 September 2016

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Class 4, 7 September 2016

Goals

Goal 1: You will know how to work with numbers.

Goal 2: You will know how to break a problem down into series of simpler problems.

Vocabulary

Primitive Type
Operator
Number
Evaluates
Decomposition

Code

```
parseInt()
parseFloat()
+, -, *, /
Math.pow()
Math.round()
Math.ceil()
Math.floor()
.toString()
.toFixed()
```

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Getting to know your partner

- **Share name and grade**
- **If you had to eat a worm, how would you cook it?**

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Review

What is an ALGORITHM?

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Review

What is an ALGORITHM?

A **series** of **finite** steps that will **solve a problem**.

Time to Grade

1. Open Task04-Madlib
2. Swap computer with partner
3. Use rubric to grade partner's program

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Goal 1: You will know how to work with numbers.

Primitive Type

Definition: The simplest kind of data JavaScript can work with.

String	Number
`"Hello"`	`-15`
`"Jack"`	`3.954`
`"5"`	`5`

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Goal 1: You will know how to work with numbers.

Operator

Definition: An action you can use with a specific primitive.

String

```
"Hello" + "Jack"
```

evaluates to `"HelloJack"`

```
"Hello".length
```

evaluates to `5`

Number

```
-15 + 4
```

evaluates to `-11`

```
Math.pow(5,3)
```

evaluates to `125`

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Goal 1: You will know how to work with numbers.

Operator

Definition: An action you can use with a specific primitive.

String

```
"5" + "2"
```

evaluates to `"52"`

Number

```
5 + 2
```

evaluates to `7`

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Goal 1: You will know how to work with numbers.

Type Conversion

Definition: Changing one primitive type to another.

String -> Number

```
parseInt("-2")
```

evaluates to `-2`

```
parseFloat("7.8")
```

evaluates to `7.8`

Number -> String

```
"" + -2
```

evaluates to `"-2"`

```
7.8.toString()
```

evaluates to `"7.8"`

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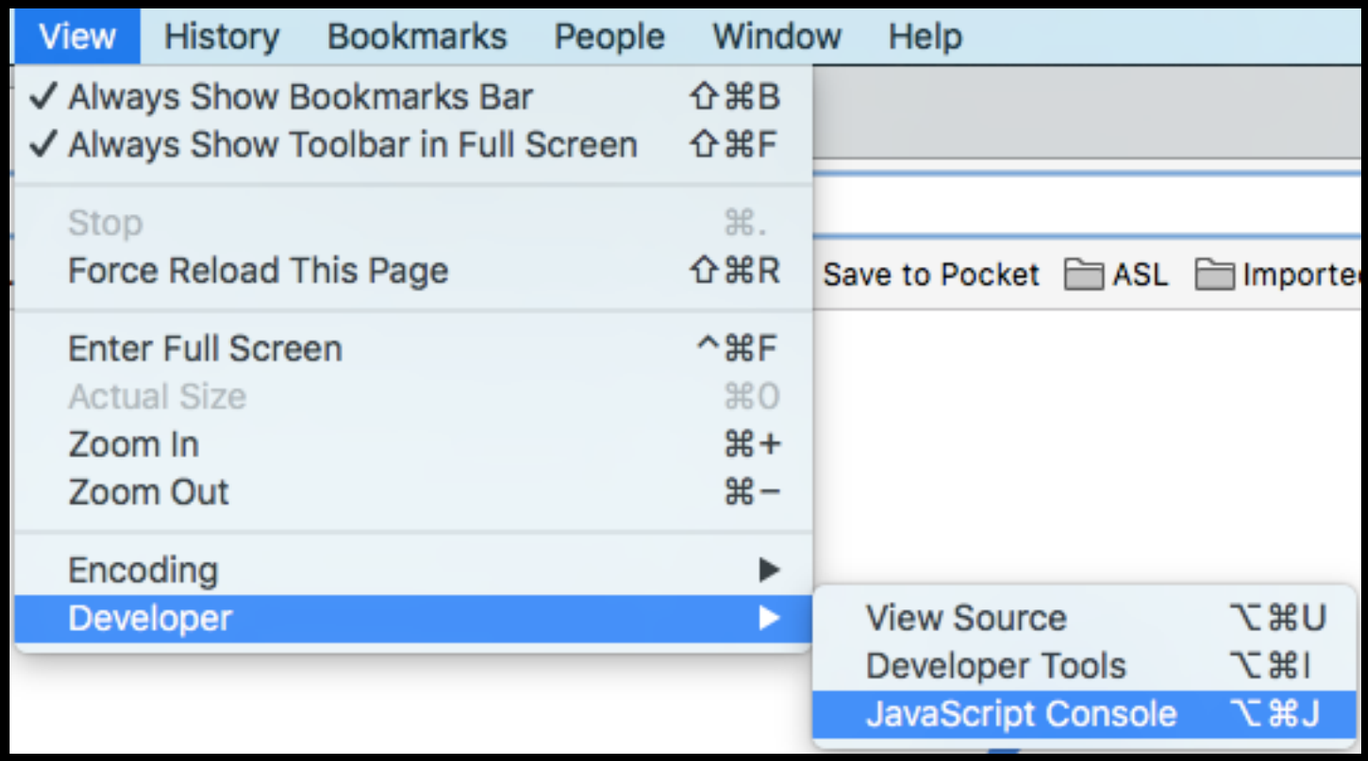
Goal 1: You will know how to work with numbers.

Let's do some math!

1. Open up the JavaScript Console.
2. Figure out the JavaScript code for each mathematical expression.



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Goal 1: You will know how to work with numbers.

Math Operations

Addition	`+`
Subtraction	`-`
Multiplication	`*`
Division	`/`
Exponentiation	`Math.pow(a, b)`
Round	`Math.round(a)`
Round Up	`Math.ceil(a)`
Round Down	`Math.floor(a)`
Round to n places	`a.toFixed(n)`

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Goal 1: You will know how to work with numbers.

Let's do some math!

1 a. $0.63 + 2^2$ `0.63 + Math.pow(2, 2)`	**1 b.** $2 - 5.09 \cdot (1 + 3)^4$ `2 - 5.09 * Math.pow((1 + 3), 4)`
2 a. $4.58 + 7 \cdot 2^3$ `4.58 + 7 * Math.pow(2, 3)`	**2 b.** $\frac{4}{1.12 \cdot (-2)}$ `4 / (1.12 * -2)`
3 a. $\frac{-2 + 7.63}{(3 + 4)^2}$ `(-2 + 7.63) / Math.pow((3+4), 2)`	**3 b.** $(-2 + 6) \cdot (-6 + 7 + 9)$ `(-2 + 6) * (-6 + 7 + 9)`
4 a. $-7.34 - 9.88 \cdot (-6.17) - 3$ `-7.34 - 9.88 * -6.17 - 3`	**4 b.** $7.08 + 8 \cdot 0.68 - 2^5$ `7.08 + 8 * 0.68 - Math.pow(2, 5)`
5 a. $-0.11 - 1 \cdot 1^2$ `-0.11 - 1 * Math.pow(1, 2)`	**5 b.** $-9.15 - 10 \cdot 8.85 - (-4 + 1.24)$ `-9.15 - 10 * 8.85 - (-4 + 1.24)`

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Goal 2: You will know how to break a problem down into series of simpler problems.

Decomposition

Definition: Break a problem into smaller, easier problems.

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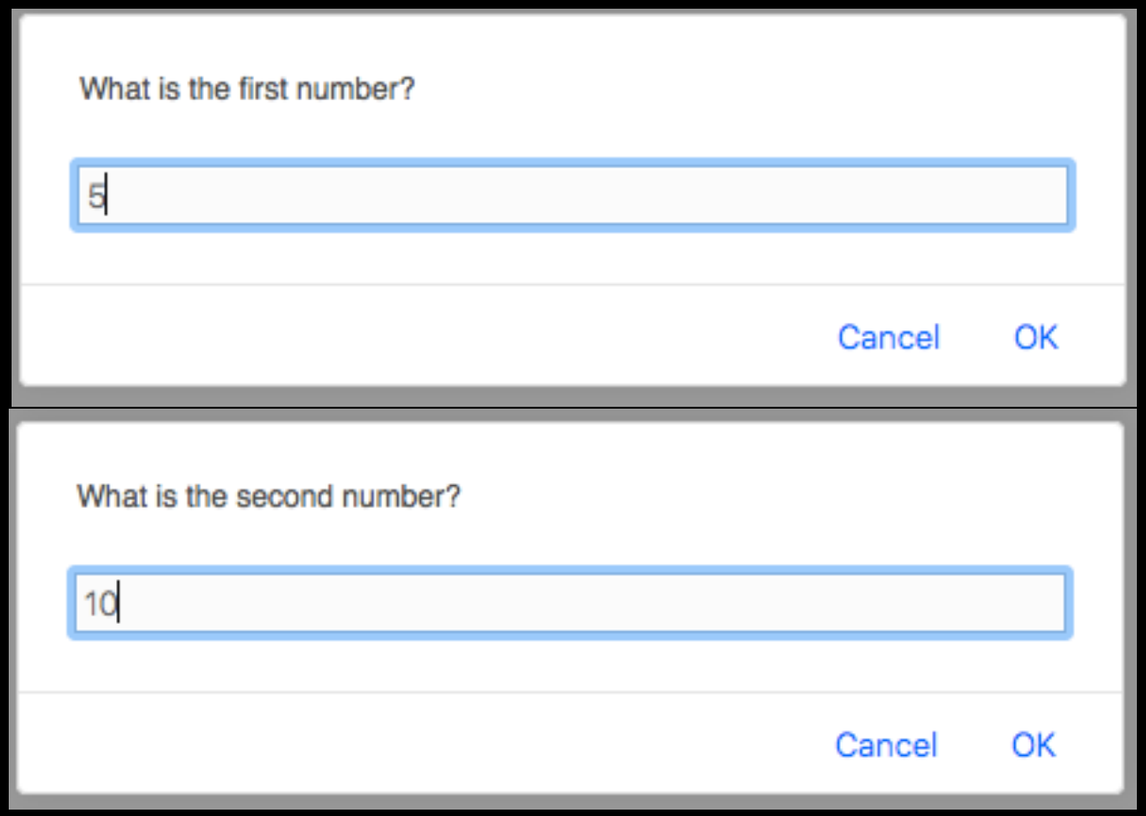
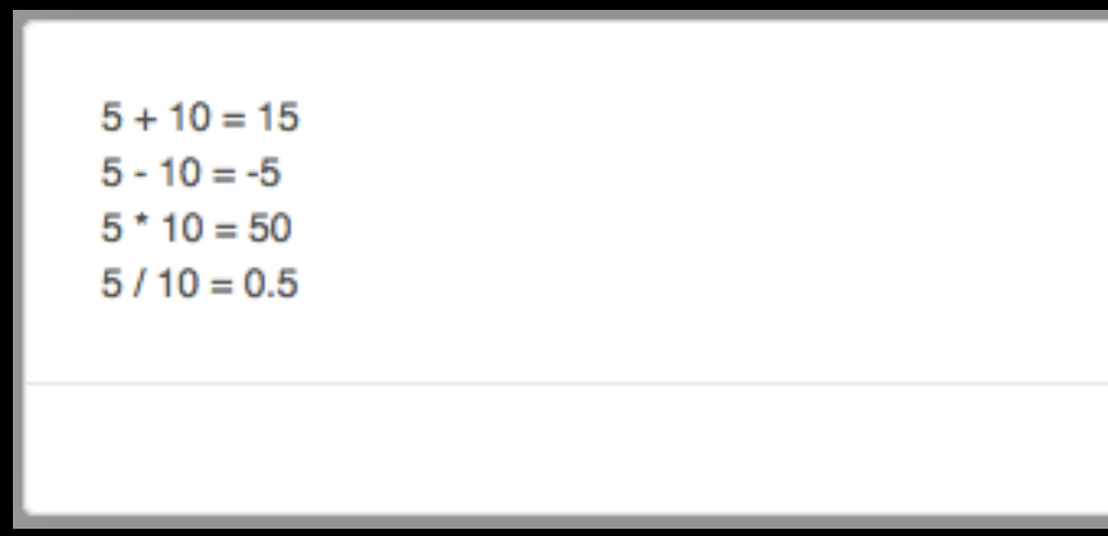
Task05-SimpleMath

Create a program called Task05-SimpleMath.html that prompts for two integers. Print the sum, difference, product, and quotient of those numbers as shown in the example output.





With your partner, write the algorithm/flowchart in English

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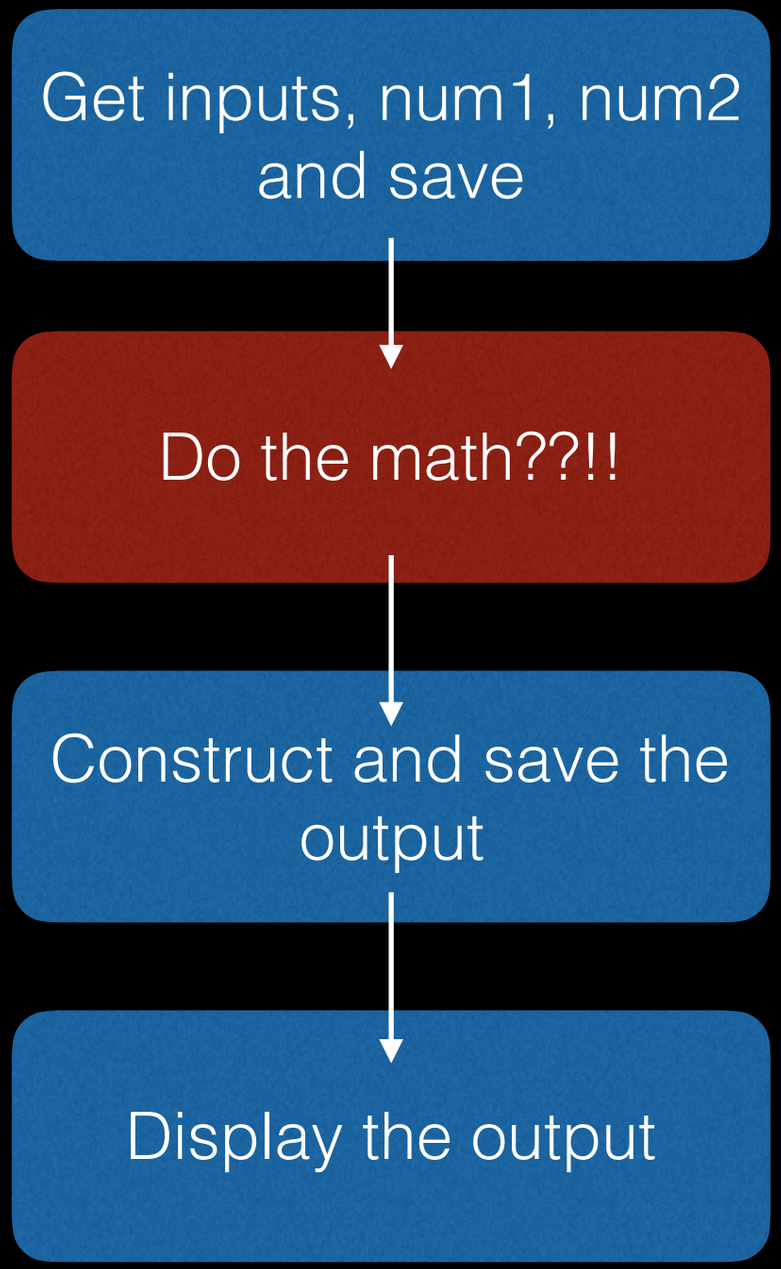
Goal 2: You will know how to break a problem down into series of simpler problems.

Brainstorm smaller, simpler problems.

Flowchart



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Goal 2: You will know how to break a problem down into series of simpler problems.

Simpler Problems

1. Get two numbers from the user and display the two numbers. 5, 10 -> "You entered 5 and 10"
2. Get two numbers from the user and display the sum of the two numbers. 5, 10 -> "15"
3. Get two numbers from the user and display the sum with the number sentence of the two numbers.
   5, 10 -> "5 + 10 =15"
4. Go for it!

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