Lesson 5: If/Else Statements and Math Operations

Download, unzip, and move the Lesson5 folder to your Desktop. Remember to cd into your Desktop, and then the folder.

But first - revisiting the time zone solution...

```
function task2(hours_since_midnight = .5) {
  let final_EST_time = hours_since_midnight%24; //takes whatever amount of time is left
  //over in the most recent day, this is the current time in Wilmington, DE
  let final_PAC_time; //initialize now, will assign a value later
  if (final_EST_time>=3){ //if it is past 3am on the east coast, the west coast is alrady
    //past midnight, so we can simply go backward 3 hours and arrive at the right anser
    final_PAC_time = final_EST_time - 3;
  } else { //if we have not yet reached 3am on the east coast, the west coast is still
    //in the previous day, so we need to figure out how far back in the previous day we need to travel
    let gap = 3-final_EST_time; //this gives us the amount of time left before midnight on the west coast
    final_PAC_time = 24 - gap; //we subtract this value from 24, which will give us the final (military)
    //time on the west coast
  }
  console.log(final_PAC_time); //we print out the answer.

}
```

The Else statement

- “Else” is a reserved word, like “if”
- Will always follow an if block
  - Opens up a second block (without a condition)
- If (condition) → do something, or else, do some other thing
- Else blocks are only triggered when the if statement is not

```
if (0>1) { // this will never be true
  //theoretically does something
} else { //no second condition
  console.log("This gets printed!"); //this code will run
}
```

Example with Variable

- Start with a boolean variable we're given
- We want to print "Green" if the variable is true
- Print "Red" if the variable is false
- Could do this with separate if statements (see right)
    - Better way.. if/else!

```
let color = false;

if (color) {
  console.log("Green")
}
if (!color) {
  console.log("Red");
}
```

Solution

- Only need one condition
  - If that condition isn't true, then our else block will always run!
- Illustrates how single if/else constructs are binary
  - Either this or that happens

```
let color = false;

if (color) {
  console.log("Green")
} else {
  console.log("Red");
}
```

Else if statements

- What if our possible scenarios aren't binary?
  - Need a way to check for a bunch of outcomes systematically
- We use else if statements!
  - These always come after an if block
    - Or another else if
  - Don't have to have an else block after them
- Checks an additional condition
  - This block only runs if all prior conditions in the chain were false → example coming up
- Only one block in a chain can run

```
let number = 2

if (number==1) {
  console.log("Green");
} else if (number==2) {
  console.log("Red");
} else {
  console.log("Blue");
}
```

Task #1

Rectangles again! We're going to make our code from last time more concise.

- Open up Lesson5/main.js in Atom
  - Follow the instructions
- Take 8 minutes - get as far as you can
- Send questions in the chat

The Javascript Math object

- Objects are a huge part of any modern programming language
  - Think of them as a collection of variables of more basic data types
  - Javascript has many of them built in
    - We can give them info and the object can perform calculations on it
- To use commands or get values from the JS Math object, we use the syntax Math.command();

```
console.log(Math.PI);
//prints 3.14159265
```

The Math.round() Function

- Pretty straightforward, rounds inputted number according to standard rounding rules (anything 5 and above rounds up, otherwise down)
- Useful when making approximations

```
Math.round(4.7); // returns 5

Math.round(4.4); // returns 4
```

Exponents 101

- Exponents indicate a number is being multiplied by itself multiple times
  - $2^1 = 2$
  - $2^2 = 4$
  - $2^3 = 8$, and so on.
- The small number (the exponent) determines how many times we multiply the number.
- This is a very important function in math, so it's actually built into the JS Math Object

The Math.pow() Function

- This allows us to use exponents in Javascript
- First input is the base, second is the exponent (see below)

Math.pow(x, y) - the value of x to the power of y - x^y

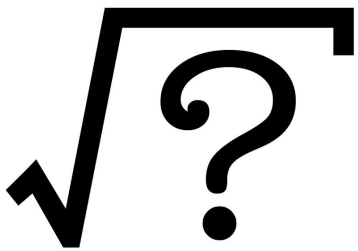
```
Math.pow(8, 2); // returns 64
```

Given a number, how could we find it's 4th power? → Example

Math.sqrt() function

```
Math.sqrt(64); // returns 8
```

- Think of this as the inverse of the Math.pow() function
- Returns the square root of the input (whatever multiplied by itself equals the input)
- Could technically use Math.pow() to achieve the same result
    - Don’t need to worry too much about the math



Task #2: Applying what we've learned

- Scroll down to Task #2 in main.js
  - Read the instructions thoroughly
  - Take 10 minutes
  - Send any questions in the chat

Review

Today we learned:

- If/else if/else **control flow**
- The Math object
  - Math.round(x)
  - Math.pow(x,y)
  - Math.sqrt(x)

Wrap Up

Email questions to info.codedelaware@gmail.com

Next class: Tomorrow, Thursday 1/14

We'll be halfway done!