

Intro to Programming

Computers are *dumb*.

We have to give them instructions to make them do things.

We do this by...

- Storing data in variables (or constants)
- Writing functions that complete specific tasks
- Using logic to make decisions
- Using loops to repeat tasks over and over

What is a variable?

Everything in the world around us has attributes we can identify.

Example

This whiteboard has...

- a width and height
- a color
- no grid lines (but some do)

We can store these attributes or qualities in variables.

Variables are like storage containers.

Example:

```
width = 24;           // inches (integer)
height = 36.5;        // inches (float)
color = "white";       // (string)
hasGridLines = false; // (boolean)
```

These (values) are called data types.

We can use data types and variables to pass information around our programs more easily.

**We have variables down, so let's
get into functions!**

We write a function to complete one specific task.

Example: If my job is to say "hello"

```
function instructor() {  
  // say "hello"  
}
```

Ignore syntax, this is pseudo code!

We can also pass information into functions using variables.

We can make this function say hello to a specific person.

```
function instructor(person) {  
  // say "hello" to person  
}
```

```
instructor("Dylan");
```

*The **person** is passed into the function as a parameter (in this case, "Dylan") and then used in the sentence.*

**Now let's get into logic and
making decisions**

Say I want to write some logic to determine whether or not I should eat.

A logic statement will equate to a boolean value true or false

```
if (instructor == "hungry") {  
    // Eat food  
} else {  
    // Don't eat food  
}
```

If I'm hungry, "logically" I should eat some food, if not, then I don't.

We all know that sometimes we eat when we're not hungry, but bored!

```
if (instructor == "hungry" || instructor == "bored") {  
    // Eat food  
} else {  
    // Don't eat food  
}
```

What happened there?

We used some operators to help our logical statement make a decision.

There are two different types of operators

- Comparison operators
- Logical operators

Comparison Operators

> // greater than
< // less than
== // equal to (2 equal signs)
!= // not equal to
>= // greater than OR equal to
<= // less than OR equal to

! is called a "bang" and means "not"

Logical Operators

`&& // and`

`|| // or (double pipe)`

Let's look at our logical statement again

```
if (instructor == "hungry" || instructor == "bored") {  
    // Eat food  
} else {  
    // Don't eat food  
}
```

If "hungry" OR (double pipe) "bored", eat.

Combine operators to find the boolean value of a statement

```
true && true    // true
true && false   // false
true || false   // true
true || true    // true
false || false  // false
false && false  // false
```

Now let's get into loops!

Repeat a certain task over and over

- "while" a certain condition is true
- for a designated number of times
- for every item in a set

Examples

```
while (students == clapping) {  
  # jumping jacks  
}
```

```
for (10 times) {  
  # jumping jack  
}
```

```
forEach (assignment in incompletedAssignments) {  
  # jumping jack  
}
```

That's it!

All programs use these basic principles to give computers instructions.

Each programming language will have slightly different syntax, but do similar things!