

VARIABLES

**SLIDES CREATED BY ANNEMARIE
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DATA TYPES

Primitives

- Names are reserved
- Do not have properties or methods
- ONLY hold their value

Objects

- Do have properties and methods
- Example: String
 - Concatenation!
- Will go into more depth later

Primitives

Byte

Short

Int

Long

Char

Boolean

Float

Double

DECLARATION

PRIMITIVE:

int num = 5;

OBJECT:

String name = "AnneMarie";

OR

String name = new String("AnneMarie");

Declaration – creates variable

Initialize – gives the variable a value (otherwise it's considered 0, null, etc)



Integer Arithmetic:

With non-even results, divides then truncates (cuts off decimal)

Examples:

$$7/2 = 3$$

$$10/4 = 2$$

Need to cast one of the ints to a double before dividing:

```
int quotient = (double) 7/ 3;
```



**DON'T DIVIDE
BY ZERO**

ARITHMETIC

Operators

- Addition: +
- Subtraction: -
- Negation: -
- Multiplication: *
- Division: /
- **Modulo: %**



COMPOUND ASSIGNMENT



COMPOUND	IS SAME AS:
<code>a += b;</code>	<code>a = a + b;</code>
<code>a -= b;</code>	<code>a = a - b;</code>
<code>a *= b;</code>	<code>a = a * b;</code>
<code>a /= b;</code>	<code>a = a / b;</code>
<code>a %= b;</code>	<code>a = a % b;</code>

Casting

changing the variable type

(sometype) (somename)



Examples:

```
int five = (int) 5.5;
```

```
double ten = (double) 10;
```

Why?

How you store things is important to
how you can use them.

SCOPE

THE PART OF THE PROGRAM WHERE THE VARIABLE CAN BE USED

FIELD

- Declared outside of methods
- Can be used anywhere inside the class

LOCAL

- Declared inside a method or loop
- Can only be used within the curly braces it is declared in

PARAMETER

- Declared inside the parentheses of a method
- `public static void sample (int param) {}`
- Can be used in that method

PARAMETER

- Declared inside the parentheses of a method
 - `public static void sample (int param) {}`
- Can be used in that method but nowhere else
- If you don't send a value into a variable has parameters, you'll get an error
- Example on the next slide


```
1 public class Test {  
2     public static void main(String[] args) {  
3         Integer num = new Integer(5000); // a local variable  
4         /**  
5         also primitives usually have classes (they have methods  
6         that you can use)  
7         **/  
8         System.out.println(num.toString());  
9         // this is how you call object methods  
10    }  
11 }
```



CALLING METHODS WITH OBJECTS

CONSTANT

- Declared at the top of the program
- Has the reserved word `final` in its declaration
- A variable that stays the same throughout the whole program
- Usually the name is all-caps
- Examples
 - `public final double PI = 3.14159265358979;`
 - `public final double BACKGROUND_COLOR = Color.YELLOW;`