VARIABLES

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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 for the first time (otherwise it's considered 0, null, etc)
Assign – gives variable a value

ARITHMETIC

Integer Arithmetic:

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

Examples:

7/2 = 3

10/4 = 2

DON'T DIVIDE BY ZERO

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

int quotient = (double) 7/ 3;

Operators

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

COMPOUND ASSIGNMENT

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

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

```java
public class Test {
    public static void main(String[] args) {
        Integer num = new Integer(5000); // a local variable
        /**
        also primitives usually have classes (they have methods
        that you can use)
        **/
        System.out.println(num.toString());
        // this is how you call object methods
    }
}
```

☆ 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;