# Random Method

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Java

# random #'s

- Most games rely on a random number generator.
  - pick a number
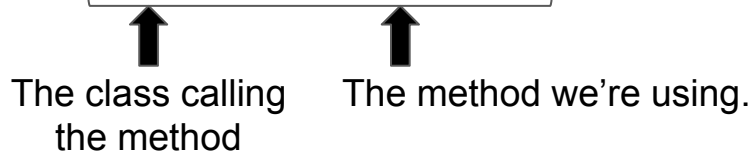  - slot machines
  - lottery
  - black jack

How do you make a random number in Java?

# New Idea: static methods!

- no need to construct object of class
- call method using class name as the object
- no object of that class exists

# Math.random()

```
System.out.print( Math.random() );
```

↑ ↑
The class calling    The method we're using.
the method

Math.random()

Returns a random number between 0 and 1

**(Inclusive of 0, but not inclusive of 1)**

# Math.random()

This could return the following:

0.1

0.25

0.5

0.75

0.9999

And everything inbetween!

# Making other numbers than 0 to 1

Examples below, but we can multiply by any number we want to create a range!                      `Math.random() * 50`

      0          *     50 = **0**

      0.25     *     50 = **12.5**

      0.5      *     50 = **25**

      0.75     *     50 = **37.5**

      0.9999   *     50 = **49.995**

See how just multiplying by 50 lets us have a range between 0 and 50 now, but still doesn't include 50.

# Same Example for 589

Examples below, but we can multiply by any number we want to create a range!                    `Math.random() * 589`

0              *       589 = **0**

0.25         *       589 = **147.25**

0.5           *       589 = **294.5**

0.75         *       589 = **441.75**

0.9999     *       589 = **588.9411**

See how just multiplying by 50 lets us have a range between 0 and 50 now, but still doesn't include 50.

# What data type does Math.random() return?

# Casting - from **double** to **int**

We want to convert the **double** to an **int** from `Math.random()`

We do this through **Casting**:

`int x = (int) Math.random();`

Think of it like multiplying by int. This MAKES it an int.

**Note: Order of Operations still matter.**

# Casting - from **double** to **int**

When **Casting,** make sure to multiply **FIRST,** otherwise the math becomes 0 * (0-.999…) which is 0 as an integer.

```
int x = (int)(Math.random() * 100);
```

Think of it like multiplying by int. This MAKES it an int.

**Note: Order of Operations still matter.**

# Random Lab

1. Create 4 random numbers and output them
   a. **An integer between 0 and 9** inclusive of both
   b. **An integer between 1 and 100** inclusive of both
   c. **A double between 2.5 and 3.5** inclusive of 2.5
   d. **A double between 14 and 589** inclusive of 14