AP COMPUTER SCIENCE

LESSON 8:

Static vs. Instance

edhesive

UNIT 5

Learning Objectives

- Understand the difference between static and instance variables and methods
- Learn some uses of static variables and methods

Static

Static is a **modifier** - it is added to a method or variable

Means that only one copy exists for all objects of that class

All objects share this variable or method

Counter

In Book class:

```
private static int num;
private int bookID;
```

In the constructor:

```
num++;
bookID = num;
```

Every time a new Book variable is created this count goes up by one.

Constants

```
public static final double PI = 3.14159265;
```

Constant is a value that cannot change.

The variable name is usually typed in all uppercase letters.

Static Variables

In general they are used to:

Create a **counter**

```
private static int num;
```

Create **constants**

```
public static final float PI = 3.14159265
```

Example Methods

```
public static void main
```

static means you do not need to create an object to use the method

Static Methods

Do not need to create an object to use them

Examples:

```
Math.random()
```

You get to these methods by using the Class name and the dot operator (.)

Non-Static Methods

Must create an object to use them

Examples:

```
Circle c  = new Circle(5);
c.getArea();
```

You get to these methods by using the object name and the dot operator (.)

Try It Yourself

Add a public static method to your Book class, called getNextID().

The method should return the current num + 1.

Practice using this in the U5L8_template main method to see how you call a static method.