LESSON 1:

Introduction to Recursion

AP COMPUTER SCIENCE

UNIT 10

edhesive

Learning Objectives

- Understand that a method may call itself and that this is called recursion
- Trace code which uses recursion and predict its results

Recursion

A method that **repeats** by calling itself

Example

```
public static void printDecimal(int n) {
    if (n >= 10)
        printDecimal(n / 10);
    System.out.println(n % 10);
}
```

Recursive methods have:

A call to itself - the **recursion**.

A **base case** to stop the recursion. This is usually an if statement.

The Stack

The **stack** is the location in memory where the interrupted method calls are stored.

Once the base case is hit the program moves through the **stack** and carries out all the commands.

Example:

```
public static void recur1 (int n) {
    if (n > 0)
        recur1 (n - 2);
    System.out.print(n + " ");
}
```

What is output by: `recur1 (6);`

Recursion Fun Facts

Any recursive method can be rewritten with a loop. The loop might be *really* long.

Used to simplify coding when the algorithm is repeated on a smaller set of data.

Recursion on the AP Exam

You will see a few recursive methods on the multiple choice section.

You will need to recognize recursion, but you will **not have to write code** for any recursive methods.