Unit 08: Recursion

Content Area: **Mathematics**
Course(s): **AP Comp Sci A**
Time Period: **Semester 2**
Length: **3 weeks**
Status: **Published**

Standards

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
TECH.K-12.1.1.d	understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.
TECH.K-12.1.6.a	choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

Enduring Understanding

Recursion is a powerful programming technique.

Recursion is self-similar.

Essential Questions

What is recursion?

How does recursion work?

Why do you need a base case in recursion?

Knowledge and Skills

- Describe how recursive method calls affect control flow
- Compare and contract an iterative approach to a problem versus a recursive approach
- Define infinite recursion and discuss ways to avoid it
- Understand and trace methods which use recursion
- Implement sorting algorithms (merge and quick sort)
- Compute statement execution counts for sorting algorithms (merge and quick sort)
- Informally compare sorting algorithms (selection, insertion, merge, and quick sorts)

Transfer Goals

Students will be able to apply a "divide and conquer" technique to solve a problem by breaking it into simpler cases.

Students will be able to select the correct tool/agorthim for a given task.

Resources

AP CS A Java Course — AP CSAwesome

Overview (Java SE 11 & JDK 11)

Albert.io

AP Classroom

Repl.it IDE