AP Computer Science Unit 7: Recursion

Unit #:	APSDO-00019744	Duration:	3.0 Week(s)	Date(s):	

Team:
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Grades:
11, 12
Subjects:
Mathematics, Science

Unit Focus

In this unit, students will focus on how to use recursion in programming projects. Comparison of the effieciencies of an iterative approach versus a recursive approach are done with Big O notation. Translation between the two approaches is practices as well as compared. Summative assessments may include projects, labs and tests. Primary instructional materials include: Java Software Solutions for AP Computer Science, Lewis Loftus and Cocking, APCentral Computer Science Course Webpage.

Stage 1: Desired Results - Key Understandings

Established Goals

Common Core
Mathematics: 11

- Determine an explicit expression, a recursive process, or steps for calculation from a context.
  CCSS.MATH.CONTENT.HSF.BF.A.1.A
- Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
  CCSS.MATH.CONTENT.HSF.BF.A.2
- Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.

Transfer

T1 (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense.
T2 (T51) Examine alternate methods to accurately and efficiently solve problems.
T3 (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts.

Meaning

Understandings

U1 (U502) Effective problem solvers identify and apply an appropriate model, tool, or strategy.
U2 (U503) Effective problem solvers try multiple strategies when struggling.
U3 (U207) Recognition of predictable

Essential Questions

Q1 (Q501) What do I picture/visualize when I look at this problem?
Q2 (Q513) How could this strategy be used to solve similar problems?
Q3 (Q533) How do I use the model to solve other problems?

CCSS.MATH.CONTENT.HSF.IF.A.3	mathematical patterns supports the analysis of functional relationships and the prediction of data.	**Q4** (Q540) What tool(s) is appropriate for use with this model?
	Acquisition of Knowledge and Skill	
	Knowledge	**Skills**
		S1 The use and recognition of recursive programming **S2** The comparison of recursion versus iteration **S3** Direct and indirect recursion **S4** The use of recursive sorts

Stage 3: Learning Plan

Coding	Code	Description of Learning Activity