

SUBJECT: AP Computer Science Applications		GRADE: 11-12	
Unit Title: Primitive Types		Time Frame: Summer Work	
UNIT OVERVIEW			
This unit explores primitive types and basic input and output.			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
Critical Thinking and Problem Solving: Numbers Riddle (S4C)		3A.CS.01 3A.CS.02 3A.CS.03	
COMPETENCIES		LEARNING TARGETS	
I can demonstrate an understanding of many digital devices		● I can explain and demonstrate basic input screen output. ● I understand that data in a program is represented by different data types. ● I understand the way variables and operators are combined in an expression determines the result. ● I understand that Java provides the ability to combine the five basic arithmetic operators with the assignment operator. The result is the compound assignment operators. ● I understand how casting helps us achieve a desired output without having to change the structure of our information. ● I understand int data type is limited in the values it can hold. If an expression results in an int value outside of the allowed range, there could be errors in outcome.	
I can code a program to express an idea or solve a problem		● I can write a program that creates String literals ● I can write a program that creates variables and can reuse them. ● I can write a program that uses basic arithmetic operators to build and evaluate compound expressions. ● I can write a program that uses the assignment operator to initialize or change the value stored in a variable.	

I can use best practices while programming	I can identify syntax errors and logic errors containing <code>System.out.print()</code>
---	--

SUBJECT: AP Computer Science Applications		GRADE: 10-12	
Unit Title: Using Objects		Time Frame: First Marking Period	
UNIT OVERVIEW			
This unit explores the use of objects in Java and Object-Oriented Programming			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
Critical Thinking and Problem Solving: Mad Libs (S4C)		3A.CS.01 3A.CS.02 3A.CS.03	
COMPETENCIES		LEARNING TARGETS	
I can demonstrate an understanding of many digital devices		I can explain relationships between classes and objects.	
I can code a program to express an idea or solve a problem		- I can use constructors to initialize an object's attributes and identify which constructor is used when an object is instantiated. - I can create and call non-static void methods with parameters. - I can create and use non-static methods with and without parameters to return values. - I can create String objects for the String class, including use of literals and use of the keyword new.	
I can approach a challenge with computational thinking		I can explain how object behavior is represented with methods and create and use non-static void methods without parameters to achieve an expected outcome.	

SUBJECT: AP Computer Science Applications		GRADE: 10-12	
Unit Title: Boolean Expressions and If-Statements		Time Frame: End of the first and beginning of second marking periods	

UNIT OVERVIEW

In this unit students will learn to write algorithms using branching based on if/else statements and boolean values

LRG SKILLS AND DISPOSITIONS

Critical Thinking and Problem Solving: Choose An Adventure (S4C)

PA STANDARDS

3A.AP.13
3A.AP.14
3A.AP.15
3A.AP.16
3A.AP.17

COMPETENCIES

I can approach a challenge with computational thinking

- I can compare primitive and reference values using Boolean expressions with relational operators.

I can code a program to express an idea or solve a problem

- I can write an algorithm that will feature the use of conditional statements to branch logical processes, as well as the effect of one-way selection on control flow.
- I can write an algorithm that will feature the use of conditional statements to branch logical processes with two-way selection when there are two sets of statements-a true and a false.
- I can write an algorithm that will feature the use of if-else-if conditional statements to branch logical processes with multi-way selection.
- I can write an algorithm that uses nested if statements, which allow for the representation of branching logical processes.

SUBJECT: AP Computer Science Applications

GRADE: 10-12

Unit Title: Iteration

Time Frame: Second Marking Period

UNIT OVERVIEW

In this unit students will explore iteration both in development and in algorithms	
LRG SKILLS AND DISPOSITIONS	PA STANDARDS
Critical Thinking and Problem Solving: Nested Loop Drawings (S4C)	3A.AP.18 3A.AP.19 3A.AP.21
COMPETENCIES	LEARNING TARGETS
I can approach a challenge with computational thinking	• I can explain while loops and how they can be used to represent iterative processes. • I explain and use for loops and how they can be used to represent iterative processes. • I can develop an algorithm to search for a substring within a String
I can demonstrate an understanding of many digital devices	• I understand the relationship between the outer and inner loops in nested iteration and how the loops are executed.

SUBJECT: AP Computer Science Applications		GRADE: 10-12	
Unit Title: Writing Classes		Time Frame: Second Marking Period	
UNIT OVERVIEW			
In this unit students will create classes and constructors for objects			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
Critical Thinking and Problem Solving: Game of Nim (S4C)		3A.AP.23	
COMPETENCIES		LEARNING TARGETS	
I can demonstrate an understanding of many digital devices		I understand the basic anatomy of a class, including instance variables, constructors, and methods.	

	• I understand the "has-a" relationship between an object and its instance variables and how a constructor sets the initial state of an object.
I can approach a challenge with computational thinking	• I can analyze specifications for a class to determine the instance variables required and implement the necessary constructors. • I understand how the use of computing can raise legal and ethical concerns.
I can use best practices while programming	• I can create comments in code and explain why they are important.
I can code a program to express an idea or solve a problem	• I can create accessor methods so that other objects can obtain the value of instance variables. • I can write methods where the private data and methods of a parameter object can be accessed.

SUBJECT: AP Computer Science Applications		GRADE: 10-12	
Unit Title: Developing Algorithms Using Arrays		Time Frame: Third Marking Period	
UNIT OVERVIEW			
In this unit students will learn about Arrays, how to create them and how to access their data			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
Critical Thinking and Problem Solving: Address Book (S4C)		3A.AP.23	
COMPETENCIES		LEARNING TARGETS	
I can code a program to express an idea or solve a problem		I can declare an array, assign values to it, and access those values without causing an exception.	
I can approach a challenge with computational thinking		I can write an algorithm to traverse an array, in part or whole, using both a standard for loop and a while loop.	

	• I can create and algorithm that uses an enhanced for loop to access data. • I can write algorithms using arrays
Developing Algorithms using Arrays	• I can write algorithms using arrays

SUBJECT: AP Computer Science Applications		GRADE: 10-12	
Unit Title: ArrayLists		Time Frame: Third Marking Period	
UNIT OVERVIEW			
In this unit students will learn about ArrayLists, how to create them and how to access their data			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
Critical Thinking and Problem Solving: Grade Book (S4C)		3A.CS.02	
COMPETENCIES		LEARNING TARGETS	
I can code a program to express an idea or solve a problem		- I can explain that ArrayLists are a different type of data structure, like an array, that is a collection of object data of the same type. - I write an algorithm to access and modify the size and elements of an ArrayList.	
I can approach a challenge with computational thinking		- I can create an algorithm that traverses and ArrayList to access data. - I can write a linear search of an ArrayList - I can implement both a selection sort and an insertion sort of an ArrayList	

SUBJECT: AP Computer Science Applications		GRADE: 10-12	
Unit Title: 2D Array		Time Frame: Third Marking Period and Fourth	

UNIT OVERVIEW

In this unit students will learn about 2D Arrays: how to create them and how to access their data

LRG SKILLS AND DISPOSITIONS

Critical Thinking and Problem Solving: Tic Tac Toe (S4C)

PA STANDARDS

3B.AP.10
3B.AP.15

COMPETENCIES

I can code a program to express an idea or solve a problem

LEARNING TARGETS

- I can declare and initialize 2D Arrays and also determine their size.
- I can create an algorithm that uses nested iteration statements to traverse and access all the elements in 2D arrays.