

## AP COMPUTER SCIENCE A

# AP Pacing Guide for Flipped Classrooms: Jan.–April 2021

## ! Overview

Due to the challenges associated with hybrid and remote learning in 2020–21, a significant amount of the content and skills colleges are requiring for credit will likely need to be assigned to students as homework or independent learning. This guide allows students who are currently behind to complete all course topics from the course and exam description by May. This guide assumes students will complete approximately 30 minutes of AP Daily videos (~10 minutes each) and topic questions each day in lieu of, or addition to, assignments the teacher would ordinarily give.

## 📅 How to Implement

This guide assumes students covered only ~25% of the course content and skills in the fall of 2020. For classes that have been forced off schedule, there may not be time for teacher-led instruction of all remaining topics.

- Teachers should **assign the AP Daily videos and topic questions** listed below as student assignments each week.
- Using the reports generated by the topic questions, teachers should focus their limited, direct class time on the Learning Objectives where students need more help.
- If students are ahead of the pace indicated below, teachers will be able to incorporate additional days or weeks to spend more time on challenging topics, practicing course skills, or reviewing for the exam.

## 📅 Week 1: Jan. 4–8

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
4.1 while Loops	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.C: Represent iterative processes using a while loop. CON-2.D: For algorithms in the context of a particular specification that does not require the use of traversals: a. Identify standard algorithms. b. Modify standard algorithms. c. Develop an algorithm.	💡 Topic Questions

\*Prioritize the most challenging Learning Objectives for your students for direct, synchronous instruction.

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
4.2 for Loops	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.E: Represent iterative processes using a for loop.	💡 Topic Questions





 **Week 2: Jan. 11–15**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
4.3 Developing Algorithms Using Strings	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.F: For algorithms in the context of a particular specification that involves <code>String</code> objects: a. Identify standard algorithms. b. Modify standard algorithms. c. Develop an algorithm.	💡 Topic Questions
4.4 Nested Iteration	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.G: Represent nested iterative processes.	💡 Topic Questions






 **Week 3: Jan. 18–22**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
4.5 Informal Code Analysis	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.H: Compute statement execution counts and informal run-time comparison of iterative statements.	💡 Topic Questions 📌 Personal Progress Check
5.1 Anatomy of a Class	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	MOD-2.A: Designate access and visibility constraints to classes, data, constructors, and methods. MOD-3.A: Designate private visibility of instance variables to encapsulate the attributes of an object.	
5.2 Constructors	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	MOD-2.B: Define instance variables for the attributes to be initialized through the constructors of a class.	💡 Topic Questions



 **Week 4: Jan. 25–29**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
5.3 Documentation with Comments	AP Daily Video 1 AP Daily Video 2	MOD-2.C: Describe the functionality and use of program code through comments.	 Topic Questions
5.4 Accessor Methods	AP Daily Video 1 AP Daily Video 2	MOD-2.D: Define behaviors of an object through non-void methods without parameters written in a class.	 Topic Questions
5.5 Mutator Methods	AP Daily Video 1 AP Daily Video 2	MOD-2.E: Define behaviors of an object through void methods with or without parameters written in a class.	 Topic Questions
5.6 Writing Methods	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	MOD-2.F: Define behaviors of an object through non-void methods with parameters written in a class.	 Topic Questions



 **Week 5: Feb. 1–5**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
5.7 Static Variables and Methods	AP Daily Video 1 AP Daily Video 2	MOD-2.G: Define behaviors of a class through static methods. MOD-2.H: Define the static variables that belong to the class.	 Topic Questions
5.8 Scope and Access	AP Daily Video 1 AP Daily Video 2	VAR-1.G: Explain where variables can be used in the program code.	 Topic Questions
5.9 <code>this</code> Keyword	AP Daily Video 1	VAR-1.H: Evaluate object reference expressions that use the keyword <code>this</code> .	 Topic Questions
5.10 Ethical and Social Implications of Computing Systems	AP Daily Video 1	IOC-1.A: Explain the ethical and social implications of computing systems.	 Topic Questions  Personal Progress Check



 **Week 6: Feb. 8–12**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
6.1 Array Creation and Access	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-2.A: Represent collections of related primitive or object reference data using one-dimensional (1D) array objects.	 Topic Questions
6.2 Traversing Arrays	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-2.B: Traverse the elements in a 1D array.	 Topic Questions

 **Week 7: Feb. 15–19**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
6.3 Enhanced for Loop for Arrays	AP Daily Video 1	VAR-2.C: Traverse the elements in a 1D array object using an enhanced for loop.	 Topic Questions
6.4 Developing Algorithms Using Arrays	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.I: For algorithms in the context of a particular specification that requires the use of array traversals: a. Identify standard algorithms. b. Modify standard algorithms. c. Develop an algorithm.	 Topic Questions

 **Week 8: Feb. 22–26**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
7.1 Introduction to ArrayList	AP Daily Video 1 AP Daily Video 2	VAR-2.D: Represent collections of related object reference data using ArrayList objects.	 Topic Questions
7.2 ArrayList Methods	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-2.D: Represent collections of related object reference data using ArrayList objects.	 Topic Questions

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
7.3 Traversing ArrayLists	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-2.E: For ArrayList objects: a. Traverse using a for or while loop. b. Traverse using an enhanced for loop.	💡 Topic Questions
7.4 Developing Algorithms Using ArrayLists	AP Daily Video 1 AP Daily Video 2	CON-2.J: For algorithms in the context of a particular specification that requires the use of ArrayList traversals: a. Identify standard algorithms. b. Modify standard algorithms. c. Develop an algorithm.	💡 Topic Questions


 **Week 9: Mar. 1–5**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
7.5 Searching	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.K: Apply sequential/linear search algorithms to search for specific information in array or ArrayList objects.	💡 Topic Questions
7.6 Sorting	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.L: Apply selection sort and insertion sort algorithms to sort the elements of array or ArrayList objects. CON-2.M: Compute statement execution counts and informal run-time comparison of sorting algorithms.	💡 Topic Questions
7.7 Ethical Issues Around Data Collection	AP Daily Video 1	IOC-1.B: Explain the risks to privacy from collecting and storing personal data on computer systems.	📄 Personal Progress Check





 **Week 10: Mar. 8–12**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
8.1 2D Arrays	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-2.F: Represent collections of related primitive or object reference data using two-dimensional (2D) array objects.	💡 Topic Questions





 **Week 11: Mar. 15–19**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
8.2 Traversing 2D Arrays	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-2.G: For 2D array objects: a. Traverse using nested for loops. b. Traverse using nested enhanced for loops. CON-2.N: For algorithms in the context of a particular specification that requires the use of 2D array traversals: a. Identify standard algorithms. b. Modify standard algorithms. c. Develop an algorithm.	 Topic Questions




 **Week 12: Mar. 22–26**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
9.1 Creating Superclasses and Subclasses	AP Daily Video 1 AP Daily Video 2	MOD-3.B: Create an inheritance relationship from a subclass to the superclass.	 Topic Questions
9.2 Writing Constructors for Subclasses	AP Daily Video 1 AP Daily Video 2	MOD-3.B: Create an inheritance relationship from a subclass to the superclass.	 Topic Questions
9.3 Overriding Methods	AP Daily Video 1 AP Daily Video 2	MOD-3.B: Create an inheritance relationship from a subclass to the superclass.	 Topic Questions
9.4 super Keyword	AP Daily Video 1 AP Daily Video 2	MOD-3.B: Create an inheritance relationship from a subclass to the superclass.	 Topic Questions

 **Week 13: Mar. 29–Apr. 2**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
9.5 Creating References Using Inheritance Hierarchies	AP Daily Video 1 AP Daily Video 2	MOD-3.C: Define reference variables of a superclass to be assigned to an object of a subclass in the same hierarchy.	 Topic Questions
9.6 Polymorphism	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	MOD-3.D: Call methods in an inheritance relationship.	 Topic Questions
9.7 Object Superclass	AP Daily Video 1 AP Daily Video 2	MOD-3.E: Call object class methods through inheritance.	 Topic Questions  Personal Progress Check

 **Week 14: Apr. 5–9**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
10.1 Recursion	AP Daily Video 1 AP Daily Video 2	CON-2.O: Determine the result of executing recursive methods.	 Topic Questions
10.2 Recursive Searching and Sorting	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	CON-2.P: Apply recursive search algorithms to information in <code>String</code> , 1D array, or <code>ArrayList</code> objects. CON-2.Q: Apply recursive algorithms to sort elements of array or <code>ArrayList</code> objects.	 Topic Questions  Personal Progress Check