Unit 4: Arrays, Lists, & Files (4 weeks)

The following curriculum map is a Day-by-Day listing of the AP Computer Science course in chronological order. Each row represents one Day of class, based on a medium-paced class. Readings from the textbook and homework assignments are included on the Day when they should be assigned. Refer to the Introduction document for information about how to adjust this pacing for your specific classroom.

- Unit 4 Slides
- Unit 4 Word Bank
- Curriculum Assets
- Magpie Chatbot Lab

LP	Title	In Class	Reading	Homework
4.00	Test Review & Reteach	Review test	7.1 up to Arrays and Methods	Test corrections
4.01	Array Basics	WS 4.1 Poster 4.2	7.1 For-Each Loop and The Arrays Class	SC 7.1, 7.7, 7.9
4.02	For-Each Loop & Arrays Class	WS 4.2	7.2 up to Reversing an Array	SC 7.12-7.14
4.03	Printing, Searching, & Testing for Equality	WS 4.3 Mini-lessons		SC 7.14-7.17, E 7.3
4.03	Printing, Searching, & Testing for Equality (Day 2)		7.3	SC 7.19-7.21
4.04	Reference Semantics	WS 4.4 7.4 up to Command-Line Arguments	E 7.9, 7.10	
4.05	Shifting Values & Arrays of Objects	SC 7.22, 7.23, 7.25, 7.26, 7.30; E 7.16	7.4 Nested Arrays, 7.5 Rectangular Two Dimensional Arrays	SC 7.27-7.29, E 7.14
4.06	Nested Loop Algorithms & Rectangular Arrays	WS 4.6	10.1 up to Adding to and Removing from an ArrayList	SC [TBD][]
4.07	ArrayList	Grudgeball Poster 4.7		Outline Ch. 7 and 10.1
4.08	Finding & Fixing Errors	Fix HW	Review Ch. 7, 10.1 for Magpie lab	Submit questions for review
4.09 01	[Magpie Chatbot Lab][] (Day 1)	Magpie Chatbot Lab Activity 1 & 2	Barron's Ch. 6 (8th or later: Ch. 7)	
4.09 02	[Magpie Chatbot Lab][] (Day 2)	Magpie Chatbot Lab Activity 2	Barron's Ch. 6 (8th or later: Ch. 7)	
4.09 03	[Magpie Chatbot Lab][] (Day 3)	Magpie Chatbot Lab Activity 3	Barron's Ch. 6 (8th or later: Ch. 7)	
4.09 04	[Magpie Chatbot Lab][] (Day 4)	Magpie Chatbot Lab Activity 4		Barron's Ch. 6 (8th or later: Ch. 7)practice questions

LP	Title	In Class	Reading	Homework
4.09 05	[Magpie Chatbot Lab][] (Day 5)	Magpie Chatbot Lab Activity 5		Check and correct Barron's Ch. 6 (8th or later: Ch. 7) questions
4.09a 01	Steganography Lab (Day 1)	Steganography Lab Activity 1	Barron's Ch. 6 (8th or later: Ch. 7)	
4.09a 02	Steganography Lab (Day 2)	Steganography Lab Activity 2	Barron's Ch. 6 (8th or later: Ch. 7)	
4.09a 03	Steganography Lab (Day 3)	Steganography Lab Activity 3	Barron's Ch. 6 (8th or later: Ch. 7)	
4.09a 04	Steganography Lab (Day 4)	Steganography Lab Activity 4	Barron's Ch. 6 (8th or later: Ch. 7)	
4.09a 05	Steganography Lab (Day 5)	Steganography Lab Activity 5		Barron's Ch. 6 (8th or later: Ch. 7)practice questions
4.09a 06	Steganography Lab (Day 6)	Steganography Lab Activity 5 (Day 2)		Check and correct Barron's Ch. 6 (8th or later: Ch. 7) questions
4.10	Review	Review questions WS 4.10 practice test		Study
4.99	Unit 4 test	Test 3 Section I Test 3 Section II		
4.XX	[Programming Project][](Magpie Alternative)			

4.00

Lesson 4.00	*Test Review & Reteach*
Objectives	Students will re-learn or strengthen content knowledge and skills from Unit 3.
Assessments	Students will re-submit test answers with updated corrections for partial or full credit, depending on instructor preference.
In Class	Review test
Reading	7.1 up to "*Arrays and Methods*"
Homework	Test corrections

4.01

Lesson 4.01	*Array Basics*
Objectives	Students will define, populate, and access arrays.
Assessments	Students will complete manipulatives exercises on WS 4.1.1

Lesson 4.01	*Array Basics*
In Class	WS 4.1 Poster 4.2
Reading	7.1 "*For-Each Loop*" and "*The Arrays Class*"
Homework	SC 7.1,7,9

4.02

Lesson 4.02	*For-Each Loop & Arrays Class*
Objectives	Students will define, populate, and access arrays.
Assessments	Students will complete manipulatives exercises on WS 4.2
In Class	WS 4.2
Reading	7.2 up to "*Reversing an Array*"
Homework	SC 7.12–14

4.03.1

Lesson 4.03	*Printing, Searching, & Testing for Equality (Day 1)*
Objectives	Students will be able to manipulate single-dimension arrays using a variety of array transversal algorithms.
Assessments	Students will teach a mini-lesson on printing, searching/replacing, testing for equality, reversing an array, or string traversal. Students will complete a quiz at the end of Day 2.
In Class	WS 4.3 Teach mini-lessons
Reading	
Homework	SC 7.14–17 E 7.3

4.03.2

Lesson 4.03	*Printing, Searching, & Testing for Equality (Day 2)*
Objectives	
Assessments	
In Class	
Reading	7.3
Homework	SC 7.19–21

4.04

Lesson 4.04	*Reference Semantics*
Objectives	Students will be able to compare and contrast how primitives and arrays are treated when passed as parameters.
Assessments	Students will complete graphic organizers and a worksheet. Some students will complete a Pokémon Challenge for extra credit.
In Class	WS 4.4
Reading	7.4 up to "*Command-Line Arguments*"
Homework	EX 7.9–10

4.05

Lesson 4.05	*Shifting Values & Arrays of Objects*
Objectives	Students will be able to shift elements within an array and construct arrays of objects.
Assessments	Students will complete Practice questions and model memory manipulation using array whiteboards.
In Class	SC 7.22,23,25,26,30 E 7.16
Reading	7.4 "*Nested Arrays*" 7.5 "*Rectangular Two Dimensional Arrays*"
Homework	SC 7.27–29 E 7.14

4.06

Lesson 4.06	*Nested Loop Algorithms & Rectangular Arrays*
Objectives	Students will correctly adjust nested loop headers for use with arrays Students will correctly construct two-dimensional arrays
Assessments	Students will complete WS 4.6
In Class	WS 4.6
Reading	10.1 up to "*Adding to and Removing from an ArrayList*"
Homework	SC [*TBD*][]

4.07

Lesson 4.07	*ArrayList*
Objectives	Students will construct code using ArrayList Students will predict the output of methods that take arrays as parameters and/or return arrays.
Assessments	Students will evaluate statements and predict output during a game of Grudgeball.
In Class	Grudgeball Poster 4.7
Reading	
Homework	Outline Ch. 7 and 10.1

4.08

Lesson 4.08	*Finding & Fixing Errors*
Objectives	Students will find errors in their returned homework assignments, and correct their code.
Assessments	Students will re-submit all homework assignments with corrected answers.
In Class	Fix homework
Reading	Review Ch. 7, 10.1 for Magpie lab
Homework	Submit questions for review

4.09.1

Lesson 4.09	*Magpie Lab (Day 1)*
Objectives	Students will complete a long-form lab, using if statements, algorithms, the String class, arrays, and ArrayLists.

Lesson 4.09	*Magpie Lab (Day 1)*
Assessments	Students will complete the College Board's AP CS A Magpie Chatbot Lab. Students will answer assessment questions on the fourth class exam.
In Class	Lab: [Magpie Chatbot Lab][] Magpie Chatbot Lab Activity 1 & 2
Reading	Barron's Ch. 6 (8th or later: Ch. 7)
Homework	

4.09.2

Lesson 4.09	*Magpie Lab (Day 2)*
Objectives	
Assessments	
In Class	Magpie Chatbot Lab Activity 2
Reading	Barron's Ch. 6 (8th or later: Ch. 7)
Homework	

4.09.3

Lesson 4.09	*Magpie Lab (Day 3)*
Objectives	
Assessments	
In Class	Magpie Chatbot Lab Activity 3
Reading	Barron's Ch. 6 (8th or later: Ch. 7)
Homework	

4.09.4

Lesson 4.09	*Magpie Lab (Day 4)*
Objectives	
Assessments	
In Class	Magpie Chatbot Lab Activity 4
Reading	
Homework	Barron's Ch. 6 (8th or later: Ch. 7)practice questions

4.09.5

Lesson 4.09	*Magpie Lab (Day 5)*
Objectives	
Assessments	
In Class	Magpie Chatbot Lab Activity 5
Reading	
Homework	Check and correct Barron's Ch. 6 (8th or later: Ch. 7) questions

4.09a.1

Lesson 4.09a	*Steganography Lab (Day 1)*
Objectives	Students will complete a long-form lab, using arithmetic expressions, methods, if statements, algorithms, while/for loops, arrays, and ArrayLists.
Assessments	Students will complete the College Board's AP CS A Steganography Lab. Students will answer end of activity Check your understanding and open-ended activity.
In Class	Lab: Steganography Lab Steganography Lab Activity 1
Reading	Barron's Ch. 6 (8th or later: Ch. 7)
Homework	

4.09a.2

Lesson 4.09a	*Steganography Lab (Day 2)*
Objectives	
Assessments	
In Class	Steganography Lab Activity 2
Reading	Barron's Ch. 6 (8th or later: Ch. 7)
Homework	

4.09a.3

Lesson 4.09a	*Steganography Lab (Day 3)*
Objectives	
Assessments	
In Class	Steganography Lab Activity 3
Reading	
Homework	Barron's Ch. 6 (8th or later: Ch. 7)practice questions

4.09a.4

Lesson 4.09a	*Steganography Lab (Day 4)*
Objectives	
Assessments	
In Class	Steganography Lab Activity 4
Reading	
Homework	Check and correct Barron's Ch. 6 (8th or later: Ch. 7) questions

4.09a.5

Lesson 4.09a	*Steganography Lab (Day 5)*
Objectives	
Assessments	
In Class	Steganography Lab Activity 5
Reading	
Homework	Check and correct Barron's Ch. 6 (8th or later: Ch. 7) questions

4.09a.6

Lesson 4.09a	*Steganography Lab (Day 6)*
Objectives	
Assessments	
In Class	Steganography Lab Activity 5 (Day 2)
Reading	
Homework	Check and correct Barron's Ch. 6 (8th or later: Ch. 7) questions

4.10

Lesson 4.10	*Review*
Objectives	Students will identify weaknesses in their Unit 4 knowledge.
Assessments	Students will create a personalized list of review topics to guide tonight's study session.
In Class	Review questions WS 4.10 Practice test
Reading	
Homework	Study

4.99

Unit 4 Test	*Arrays, Lists & Files*
In Class	Test 3 Section I Test 3 Section II

4.XX

Lesson 4.XX	*Programming Project(Magpie Alternative)*
Objectives	Students will be able to conduct user-centered research, plan and create, test evaluate and share
Assessments	Students will apply if-else, String methods to implement a software application and Submit a complete, functional program.
In Class	
Reading	
Homework	Conduct user-centered research to find design opportunities and barriers.

Abbreviations

- **WS** — Worksheet
- **SC** — Self-Check problem (in the textbook)
- **EX** — Exercise (in the textbook)
- **PP** — Programming Project (in the textbook)