In this lesson, students will learn about and create arrays. The use of array objects allows multiple related items to be represented using a single variable. This lesson corresponds with AP Computer Science A topic 6.1.

Objective

Students will be able to:

- Represent collections of related primitive or object reference data using one-dimensional (1D) array objects

Activities

These are all the activities included in the lesson.

Activity	
6.1.1 Introduction to Arrays (/editor/assignment/1640620/1155893/256470)	Print Slides Pro (Https://Docs.google.com/Presentation/D/194V6poB__Ry View Slides Pro (Https://Docs.google.com/Presentation/D/194V6poB
6.1.2 Quiz: Arrays (/editor/assignment/1640621/1155893/256470)	Print Quiz Pro (/Quiz/16406
6.1.3 Making an Array (/editor/assignment/1640622/1155893/256470)	
6.1.4 Make an Empty Array (/editor/assignment/1640623/1155893/256470)	
6.1.5 Indexing Into an Array (/editor/assignment/1640624/1155893/256470)	
6.1.6 Our First Array	

(/editor/assignment/4367725/1155893/256470)

6.1.7 Set Scores
(/editor/assignment/1640626/1155893/256470)

6.1.8 Last Element in Array
(/editor/assignment/4367727/1155893/256470)

6.1.9 Snap Shot Splash Screen
(/editor/assignment/1736030/1155893/256470)

Solution References

Refer to the solution reference for a more detailed look at exercise solutions.

Solution Reference	
6.1.2 Quiz: Arrays (/library/solution_references/assignment/55325785?section_id=256470)	Pro
6.1.6 Our First Array (/library/solution_references/assignment/55325789?section_id=256470)	
6.1.7 Set Scores (/library/solution_references/assignment/55325790?section_id=256470)	
6.1.8 Last Element in Array (/library/solution_references/assignment/55325791?section_id=256470)	
6.1.9 Snap Shot Splash Screen (/library/solution_references/assignment/55325792?section_id=256470)	

Problem Guides

Refer to the problem guides for a more in-depth look at this lesson's problems.

Problem Guide
6.1.6 Our First Array (/problemguides/assignment/55325789?section_id=256470)
6.1.7 Set Scores (/problemguides/assignment/55325790?section_id=256470)
6.1.8 Last Element in Array (/problemguides/assignment/55325791?section_id=256470)
6.1.9 Snap Shot Splash Screen (/problemguides/assignment/55325792?section_id=256470)

Vocabulary

These are the key terms for this lesson.

Term	Definition
Array (/glossary/term/689)	Arrays are lists that store many values of the same type
Index (/glossary/term/690)	Array values are stored at a particular index and we access elements in the array by referencing this index value. Index values in Arrays start a 0.
array.length (/glossary/term/691)	Returns the length of the array
array[index] (/glossary/term/692)	Accesses an element in the array to either update or retrieve.

Handouts

Use handouts to supplement your class. Please note that there are handouts for teachers and for students.

Planning Programs with Diagrams (teacher) (/library/resource/6690)
Planning Programs with Diagrams (student) (/library/resource/6691)

Textbook Resources

CodeHS has a textbook for this course! Click on the link to open a new tab with the corresponding lesson section of the textbook.

Textbook
Array (/library/textbook/1730166)

Planning Notes

- Arrays in Java are objects, not primitives. This means when it is passed to a method you are getting the actual object, not a copy. Any change in the method, updates the original array.
- There is a handout that accompanies this lesson. It can be used as an in-class activity or a homework assignment. Determine how and if this handout will be used and make the appropriate number of printouts prior to the class period.
- As concepts become more abstract, some students will have more difficulty than others. Check-in with these students often and use supplemental materials to aid them along. Help these students break down new vocabulary and content in small groups or strategic pairings.

Teaching and Learning Strategies

Lesson Opener:

- Have students brainstorm and write down answers to the discussion questions listed below. Students can work individually or in groups/pairs. Have them share their responses. [5 mins]

Activities:

- Watch the lesson video and take the corresponding quiz. This quiz is a quick check for understanding. [5-6 mins]
- Explore the *Making an Array* example. [5 mins]
- Explore the *Making an Empty Array* example. [5 mins]
- Explore the *Indexing Into an Array* example. [5 mins]
- Complete the *Our First Array* exercise. [10 mins]
- Complete the *Array Length* exercise. [10 mins]
- Complete the *Last Element in Array* exercise. [10 mins]
- Complete the *Find Average* exercise. [10 mins]
- Complete the *Planning Programs with Diagrams* handout. [10 mins]

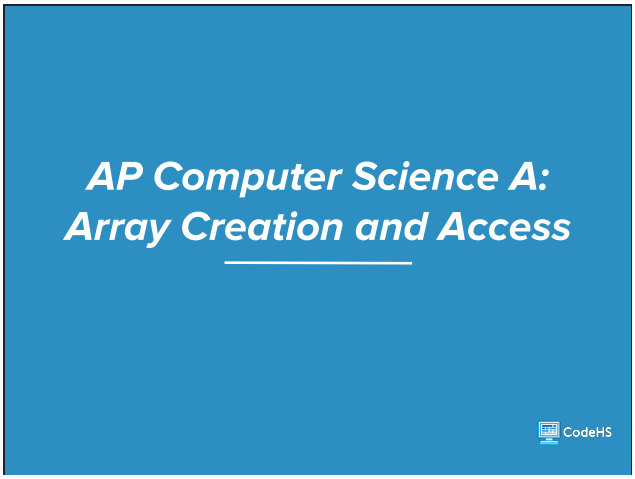
Lesson Closer:

- Have students reflect and discuss their responses to the end of class discussion questions. [5 mins]

Prior Knowledge

- Create and call objects and methods
- Boolean expressions and relational operators
- If/else and else if statements, while loops, for loops and nested loops
- Scope, access, and keyword *this*

Video Slides



Print Slides (Https://Docs.google.com/Presentation/D/194V6poB__Ryh1rMQ0uoccB2eTs1YH6iMp0_pWhmd4E4/Export/Pdf)

View Slides (Https://Docs.google.com/Presentation/D/194V6poB__Ryh1rMQ0uoccB2eTs1YH6iMp0_pWhmd4E4)

Discussion Questions

Beginning of Class:

- If we want to store a list how would we do that now?
  - *We would have to create a lot of different variables and keep track of their order.*
- Why is the method you came up with problematic?
  - *It's hard to keep track of a whole lot of different variables and we can't change anything after compile time.*

End of Class:

- What is an Array Index Out of Bounds Exception error?
  - *This error is thrown if an index that does not exist tries to be accessed.*
- How would you create an array of 6 doubles?
  - `double[] arr = new double[6];`
- How would you access the last element in an array called myNumbers?
  - `myNumbers.length - 1`

Modification: Special Education

- Pair programming with another student
- Print out slides for students to reference

Modification: English Language Learners

- Pair programming with another student
- Print out slides for students to reference

Original CodeHS Lesson Plan: https://codehs.com/course/6165/lesson/6.1