

# Abington Heights School District

## Computer Science I Honors: Java I Curriculum



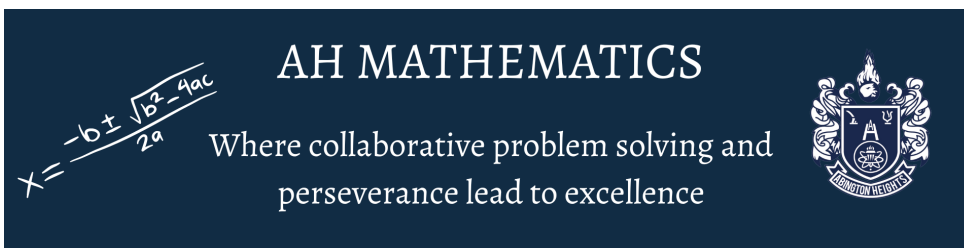
In Computer Science I Honors: Java I, students develop their computer programming skills through the following areas of study:

1. Java Basics and Printing
2. Numbers and Variables
3. Methods
4. For Loops and Nested For Loops
5. Strings and Scanners
6. Conditionals
7. Booleans, While Loops, and Random Numbers

**Board Approval Date:** June 7, 2023

**Adoption:** 2023 - 2024 SY

**Review Date:**



# Abington Heights Math Framework

Stakeholders	Actions
<b>Students</b>	<ul style="list-style-type: none"> <li>★ Engage in mathematical discussions, share their ideas openly, be inquisitive, seek to understand and learn more about mathematical concepts, and try their best daily.</li> <li>★ Exhibit creativity and curiosity in problem solving individually and collaboratively.</li> <li>★ Persevere in engaging and challenging daily mathematical practice.</li> <li>★ Come prepared to learn every day.</li> </ul>
<b>Teachers</b>	<ul style="list-style-type: none"> <li>★ Create a safe and collaborative classroom environment where students feel vested in a shared vision for mathematical excellence.</li> <li>★ Develop high quality instruction that meets the needs of all learners through differentiation.</li> <li>★ Use a variety of 21st century methodologies to advance learning.</li> <li>★ Partner with parents and guardians to support student success.</li> <li>★ Establish a collaborative community within the building and amongst grade levels to ensure a cohesive level of instruction.</li> </ul>
<b>Building Leaders</b>	<ul style="list-style-type: none"> <li>★ Deeply understand the needs of teachers, students, the instructional materials being used, programs being implemented, and the expectations for state-level assessment scores <ul style="list-style-type: none"> <li>○ Knowledgeable about program and grade level standards</li> <li>○ Ensure consistent and equal access to high-quality instructional materials and resources, building.</li> </ul> </li> <li>★ Be partners with teachers, students and families: <ul style="list-style-type: none"> <li>○ Provide guidance and support to the mathematical community.</li> <li>○ Understand needs of teachers, students and families.</li> </ul> </li> <li>★ Trust the educators to make professional decisions based on program, student, and district needs.</li> </ul>
<b>Central Admin</b>	<ul style="list-style-type: none"> <li>★ Effectively communicate to the school board and community specific areas of need and how to support teachers and building leaders in a quest for mathematical excellence</li> <li>★ Deeply understand the needs of teachers, students, the instructional materials being used, programs being implemented, and the expectations for state-level assessment scores <ul style="list-style-type: none"> <li>○ Have a common metric for mathematical excellence.</li> <li>○ Ensure consistent and equal access to high-quality instructional materials and resources, district.</li> <li>○ Re-examine best practices/curriculum routinely (6 years).</li> </ul> </li> <li>★ Support a culture of collaboration between the other stakeholder groups to maintain the standard of excellence of the Abington Heights</li> <li>★ Trust the educators to make professional decisions based on program, student, and district needs.</li> </ul>
<b>Parents/Community</b>	<ul style="list-style-type: none"> <li>★ Be a strong support system and contribute by building a positive math community for students.</li> <li>★ Encourage a positive math mindset.</li> <li>★ Have conversations with their children about school and ask what they are learning about in school.</li> <li>★ Be open, receptive to the district's ideas about student learning and reach out to teachers/school to learn more about how they can support.</li> <li>★ Trust the educators to make professional decisions based on program, student, and district needs.</li> </ul>
<b>School Board</b>	<ul style="list-style-type: none"> <li>★ Provide the fiscal resources to support: <ul style="list-style-type: none"> <li>○ Highly qualified professionals for mathematics</li> <li>○ High-quality instructional materials</li> <li>○ Effective and efficient math interventions for remediation</li> <li>○ Professional development for math content and instructional practices</li> </ul> </li> <li>★ Trust the educators to make professional decisions based on program, student, and district needs.</li> </ul>

### Computer Science I Honors: Java I Scope and Sequence

Month	Unit	Estimated Number of Weeks
September	Computer Science Basics	3
	Java Basics and Printing	1
October	Java Basics and Printing	1
	Numbers and Variables	3
November	Numbers and Variables	1
	Methods	3
December	Methods	2
	For Loops	1
January	For Loops	3
February	Nested For Loops	3
March	Strings and Scanners	4
April	Strings and Scanners	1
	Conditionals	3
May	Conditionals	1
	Booleans, While Loops and Random Numbers	4
June	Booleans, While Loops and Random Numbers	1

	Essential Questions	Content	Skills	Activities	Assessment / Evidence of Learning
<b>Computer Science Basics</b>	<p>What are the steps to solve problems?</p> <p>What strategies help us solve problems?</p> <p>What is an algorithm and how is it used?</p> <p>What are the parts of a computer system?</p> <p>How does a computer store information (binary numbers)?</p>	<p>Problem Solving Skills</p> <p>Algorithms</p> <p>Sequencing</p> <p>Parts of a Computer</p> <p>Binary Number System</p>	<p>Explain the steps to solve a problem.</p> <p>Explain how sequencing affects the output of a program or a problem.</p> <p>Identify and characterize parts of a computer.</p> <p>Describe the binary number system and be able to fluently convert numbers.</p>	<p>Lego Building (Algorithms)</p> <p>Algorithmic problems and sequencing</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p>	<p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>
<b>Java Basics and Printing</b>	<p>How do you print out numbers and words using Java?</p> <p>What are data types?</p> <p>How does Java use data types to store information?</p>	<p>Syntax of a Program</p> <p>Java Keywords</p> <p>Comments</p> <p>Errors</p> <p>Print Statements</p> <p>Escape Sequences</p>	<p>Consistently use proper syntax in setting up a general Java Program, and in printing simple statements.</p> <p>Use proper escape sequences to get proper outputs.</p>	<p>Live Coding</p> <p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>	<p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>

	Essential Questions	Content	Skills	Activities	Assessment / Evidence of Learning
<b>Numbers and Variables</b>	<p>How do data types affect how the result gets calculated?</p> <p>How do you use concatenation to connect strings?</p> <p>Why would you use variables to help make programs more useable?</p> <p>What is the scope of declared variables?</p>	<p>Math Operations with different data types</p> <p>String Concatenation</p> <p>Declaring, assigning, and using variables of different data types (primitive)</p>	<p>Explain how using mathematical operations with different data types affects the result.</p> <p>How to use concatenation to print specific formats.</p> <p>Explain how to use variables to streamline program.</p>	<p>Live Coding</p> <p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>	<p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>
<b>Methods</b>	<p>What are methods used for in programming?</p> <p>What are arguments and parameters used for in methods and how do they make programs more efficient?</p> <p>Why should we return values to where we call methods in our programs?</p>	<p>Method Syntax</p> <p>Parameters</p> <p>Arguments</p> <p>Return Methods</p>	<p>Use proper syntax to create custom methods.</p> <p>Use parameters and arguments to transfer values between the main method and custom methods.</p> <p>Store and use values that get returned from a custom method.</p>	<p>Live Coding</p> <p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>	<p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>

	Essential Questions	Content	Skills	Activities	Assessment / Evidence of Learning
<b>For Loops</b>	<p>What types of events would need repetition in the real world?</p> <p>How can we repeat programming statements that need to be used multiple times.</p> <p>How does using repetition and iteration make our programs more efficient?</p>	<p>For Loop Syntax</p> <p>Loop Counter Initialization</p> <p>Loop Counter Condition</p> <p>Loop Counter Increment</p> <p>Mathematical Operations in For Loops</p> <p>Using For Loops in Custom Methods</p>	<p>Explain the syntax used in for loops.</p> <p>Create and modify for loops in order to use repeated code.</p> <p>Using for loops for repeated code in custom methods.</p>	<p>Live Coding</p> <p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>	<p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>
<b>Nested For Loops</b>	<p>What types of events would need two sets of repetition in the real world?</p> <p>What are the uses of using multiple repetitions in order to access or review information?</p>	<p>Databases (rows and columns)</p> <p>Scope of declared variables</p> <p>Drawing figures using nested loops.</p> <p>Using Mathematical Operations among rows and columns</p>	<p>Use nested repetition in order to draw figures and access information.</p> <p>Use nested for loops in custom methods using arguments and parameters.</p>	<p>Live Coding</p> <p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>	<p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>

	Essential Questions	Content	Skills	Activities	Assessment / Evidence of Learning
<b>Strings and Scanners</b>	<p>What are some reasons why we would want to manipulate string literals?</p> <p>Why is it important for the user to be able to interact with our program?</p>	<p>Built-in String Methods</p> <p>Manipulating string literals</p> <p>Syntax for setting up scanners</p> <p>User input</p> <p>Input verification</p>	<p>Explain how to use built-in methods to use and manipulate string literals.</p> <p>Enter and format user input in programs.</p>	<p>Live Coding</p> <p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>	<p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>
<b>Conditionals</b>	<p>Why do computer scientists use algorithms and control structures?</p> <p>Why are comparing values important in math/computer science?</p> <p>How do control structures help us in everyday life?</p>	<p>Control Structures -Sequences</p> <p>Control Structures - Iteration</p> <p>Iterations in Java</p> <p>Control Structures - Selections</p> <p>Selections in Java</p> <p>Nesting Iteration and Selection</p>	<p>Evaluate expressions that use arithmetic operators.</p> <p>Determine relationships between two variables, expressions, or values.</p> <p>Determine truth table values for boolean expressions.</p>	<p>Live Coding</p> <p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>	<p>Q and A during slides</p> <p>Coding “Try-its”</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>

	Essential Questions	Content	Skills	Activities	Assessment / Evidence of Learning
<b>Booleans, While Loops and Random Numbers</b>	<p>What are booleans?</p> <p>What are boolean expressions used for?</p> <p>What is DeMorgan's Law and how is it used?</p> <p>What are the pro's and con's of using while loops instead of for loops?</p>	<p>Booleans (primitive data type)</p> <p>Boolean expressions</p> <p>True/False Values</p> <p>While loops (syntax)</p> <p>Importance of while loops instead of for loops</p>	<p>Explain why booleans are important in making decisions.</p> <p>What importance does a true or false value hold?</p> <p>Using while loops for user input.</p>	<p>Live Coding</p> <p>Q and A during slides</p> <p>Coding "Try-its"</p> <p>Code Tracing (throughout slides)</p> <p>Lecture</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>	<p>Q and A during slides</p> <p>Coding "Try-its"</p> <p>Code Tracing (throughout slides)</p> <p>Worksheet</p> <p>Quiz</p> <p>Test</p>