Java Honors

Unit Title: Building Blocks of a Program

Stage 1: Desired Results

Standards & Indicators: **2020 NJSLS – Computer Science and Design Thinking**

8.1.12.CS.2: Model interactions between application software, system software, and hardware. •

8.1.12.CS.3: Compare the functions of application software, system software, and hardware.

8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits

8.1.12.AP.1: Design algorithms to solve computational problems using a combination of original and existing algorithms.

8.1.12.AP.5: Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

8.1.12.AP.6: Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.3	Examine challenges that may exist in the adoption of new ideas.	Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.
9.4.12.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.	Multiple solutions often exist to solve a problem.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).	Digital tools differ in features, capacities, and styles. Knowledge of different digital tools is helpful in selecting the best tool for a given task.

Central Idea/Enduring Understanding:
Java programs use several structures such as loops, conditionals, arrays, and variables of different types in order to perform functions.

Essential/Guiding Question:
What structures are needed in order to perform this specific task? How will they be mapped out?

Content:

Algorithms
Data types
Variables
String Manipulation

Skills(Objectives):

Students will

- Understand the concept of an algorithm
- Implement simple algorithms in Java using selection and iteration structures

Java Honors

Conditionals Loops Arrays	• Be able to trace and find flaws in Java code that uses simple structures

Interdisciplinary Connections:
As students learn programming concepts, they will develop projects that demonstrate their proficiency in both science, math, literacy and computer science.

Stage 2: Assessment Evidence

Performance Task(s):	Other Evidence:
Programs at the end of each lesson One final project One exam per unit	• Online assignments • Exit Tickets • Class discussions • Quizzes

Stage 3: Learning Plan

Learning Opportunities/Strategies:

At the beginning of each unit, there will be a class discussion on an example of new code. Deciphering what this code does, how to read it, and different types if there are any.

Depending on the topic, visual aids may be created

Students will take class time to practice using this code both on computer and on paper.

At the end of each unit, students will turn in projects, notes, and quizzes on each topic.

Resources:

- **Resources:**
- A guide to Programming in Java by Beth Brown
- CodeHs - several Java sections from site and compiler

LGBT and Disabilities Resources:
- LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth
- LGBTQ+ Books

DEI Resources:
- Learning for Justice
- GLSEN Educator Resources
- Supporting LGBTQIA Youth Resource List
- Respect Ability: Fighting Stigmas, Advancing Opportunities
- NJDOE Diversity, Equity & Inclusion Educational Resources
- Diversity Calendar

Differentiation
*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
• Projects/lessons designed to the style that	• Projects/lessons designed to the style that	• Projects/lessons designed to the style	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan

matches the student. ● Students are encouraged to explore various tools and options to extend their knowledge beyond what was presented in the classroom and to apply these techniques in their projects ● Rubrics are structured to reward students who apply new techniques ● Students are encouraged to collaborate with peers to explore and apply new techniques	matches the student. ● Projects are designed to allow students to design their project around their own interest. ● Rubrics are structured to reward students who apply new techniques ● Students are encouraged to collaborate with peers to explore and apply new techniques	that matches the student. ● Projects are designed to allow students to design their project around their own interest. ● Adjusted/shortened assignment if needed. ● One on one help as needed	or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Unit Title: Object Oriented Organization

Stage 1: Desired Results

Standards & Indicators: **2020 NJSLS – Computer Science and Design Thinking**

8.1.12.CS.2: Model interactions between application software, system software, and hardware. •

8.1.12.CS.3: Compare the functions of application software, system software, and hardware.

8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits

8.1.12.AP.1: Design algorithms to solve computational problems using a combination of original and existing algorithms.

8.1.12.AP.5: Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

Java Honors

8.1.12.AP.6: Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.3	Examine challenges that may exist in the adoption of new ideas.	Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.
9.4.12.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.	Multiple solutions often exist to solve a problem.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).	Digital tools differ in features, capacities, and styles. Knowledge of different digital tools is helpful in selecting the best tool for a given task.

Central Idea/Enduring Understanding:
Java uses objects, functions, and classes in order to organize code and allow one programmers code to be easily read and used by others, while also defining properties and behaviors of the program.

Essential/Guiding Question:

How must I organize my code in order to create objects or reference another programmers code?

Content:

Methods
Classes
Inheritance
Polymorphism
Recursion
Objects

Skills(Objectives):

Students will:

- Learn to organize a class by using methods
- Learn how to call upon another class in their code
- Learn how to create objects from their own classes
- Learn how to call a method within itself to create a recursive method

Interdisciplinary Connections:
As students learn programming concepts, they will develop projects that demonstrate their proficiency in both science, math, literacy and computer science.

Stage 2: Assessment Evidence

Performance Task(s):
Programs at the end of each lesson
One final project
One exam per unit

Other Evidence:

- Online assignments
- Exit Tickets
- Class discussions
- Quizzes

Java Honors

Stage 3: Learning Plan

Learning Opportunities/Strategies:

At the beginning of each unit, there will be a class discussion on an example of new code. Deciphering what this code does, how to read it, and different types if there are any.

Depending on the topic, visual aids may be created

Students will take class time to practice using this code both on computer and on paper.

At the end of each unit, students will turn in projects, notes, and quizzes on each topic.

Resources:

- **Resources:**
- A guide to Programming in Java by Beth Brown
- CodeHs - several Java sections from site and compiler

LGBT and Disabilities Resources:

- LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth
- LGBTQ+ Books

DEI Resources:

- Learning for Justice
- GLSEN Educator Resources
- Supporting LGBTQIA Youth Resource List
- Respect Ability: Fighting Stigmas, Advancing Opportunities
- NJDOE Diversity, Equity & Inclusion Educational Resources
- Diversity Calendar

Differentiation

*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
● Projects/lessons designed to the style that matches the student. ● Students are encouraged to explore various tools and options to extend their knowledge beyond what was presented in the classroom and to apply	● Projects/lessons designed to the style that matches the student. ● Projects are designed to allow students to design their project around their own interest. ● Rubrics are structured to reward students who	● Projects/lessons designed to the style that matches the student. ● Projects are designed to allow students to design their project around their own interest.	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids

these techniques in their projects ● Rubrics are structured to reward students who apply new techniques ● Students are encouraged to collaborate with peers to explore and apply new techniques	apply new techniques ● Students are encouraged to collaborate with peers to explore and apply new techniques	● Adjusted/shortened assignment if needed. ● One on one help as needed	Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Unit Title: Beyond Java

Stage 1: Desired Results

Standards & Indicators: **2020 NJSLS – Computer Science and Design Thinking**

8.1.12.CS.2: Model interactions between application software, system software, and hardware. •

8.1.12.CS.3: Compare the functions of application software, system software, and hardware.

8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits

8.1.12.AP.1: Design algorithms to solve computational problems using a combination of original and existing algorithms.

8.1.12.AP.5: Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

8.1.12.AP.6: Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.3	Examine challenges that may exist in the adoption of new ideas.	Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.

Java Honors

9.4.12.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.	Multiple solutions often exist to solve a problem.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).	Digital tools differ in features, capacities, and styles. Knowledge of different digital tools is helpful in selecting the best tool for a given task.

Central Idea/Enduring Understanding:
Java is just one of many programming languages, with many pros and cons. Programmers will use other languages in order to get different tasks completed.

Essential/Guiding Question:
Given this kind of problem, what language should I use, and why?

Content:

Programs for Java
C#/C++
VBA
Python

Skills(Objectives):

Students will:

- The differences between different programming languages
- How to determine what language to use for what kind of program.
- Why different operating systems in certain languages.

Interdisciplinary Connections:
As students learn programming concepts, they will develop projects that demonstrate their proficiency in both science, math, literacy and computer science.

Stage 2: Assessment Evidence

Performance Task(s):
Programs at the end of each lesson
One final project
One exam per unit

Other Evidence:

- Online assignments
- Exit Tickets
- Class discussions
- Quizzes

Stage 3: Learning Plan

Learning Opportunities/Strategies:

At the beginning of each unit, there will be a class discussion on an example of new code. Deciphering what this code does, how to read it, and different types if there are any.

Depending on the topic, visual aids may be created

Resources:

- **Resources:**
- A guide to Programming in Java by Beth Brown

- CodeHs - several Java sections from site and compiler

LGBT and Disabilities Resources:

- LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth

Java Honors

Students will take class time to practice using this code both on computer and on paper. At the end of each unit, students will turn in projects, notes, and quizzes on each topic.	• LGBTQ+ Books DEI Resources: • Learning for Justice • GLSEN Educator Resources • Supporting LGBTQIA Youth Resource List • Respect Ability: Fighting Stigmas, Advancing Opportunities • NJDOE Diversity, Equity & Inclusion Educational Resources • Diversity Calendar

Differentiation

*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
• Projects/lessons designed to the style that matches the student. • Students are encouraged to explore various tools and options to extend their knowledge beyond what was presented in the classroom and to apply these techniques in their projects • Rubrics are structured to reward students who apply new techniques • Students are encouraged to collaborate with peers to explore and apply new techniques	• rojects/lessons designed to the style that matches the student. • Projects are designed to allow students to design their project around their own interest. • Rubrics are structured to reward students who apply new techniques • Students are encouraged to collaborate with peers to explore and apply new techniques	• Projects/lessons designed to the style that matches the student. • Projects are designed to allow students to design their project around their own interest. • Adjusted/shortened assignment if needed. • One on one help as needed	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Java Honors

Pacing Guide

Course Name	Resource	Content Standards
UNIT 1 (36 Days) ● Data types and Variables ● Conditionals (if-statements) ● Iterations (loops) ● Arrays and Lists	**CHAPTERS** 3 & 4: (10 Days) 5: (5 Days) 8: (14 Days) 6 & 10: (7 Days)	8.1.12.CS 2-3 8.1.12 IC. 2 8.1.12.AP 1 8.1.12.AP.5-6
UNIT 2 (27 Days) ● Methods and Classes ● Objects ● Recursion and Inheritance	**CHAPTERS** 7 & 8: (17 Days) 9 & 13: (10 Days)	8.1.12.CS 2-3 8.1.12 IC. 2 8.1.12.AP 1 8.1.12.AP.5-6
UNIT 3 (26 Days) ● Java Final ● Differences between languages ● Project in different language	**CHAPTERS*** N/A: (9 Days) N/A: (7 Days) N/A: (10 Days) *Other online resources will be utilized during this unit.	8.1.12.CS 2-3 8.1.12 IC. 2 8.1.12.AP 1 8.1.12.AP.5-6
Total: 89 Days		