



SPRINGFIELD PUBLIC SCHOOLS
ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Springfield Public Schools
Springfield, New Jersey 07081

Introduction to Java
Grades 10-12

Curriculum Guide

2022

This curriculum may be modified through varying materials, techniques and strategies,
as per a student's IEP.

Springfield Board of Education
Approved July 25, 2022



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**Springfield Public Schools
Springfield, New Jersey**

**Dr. Rachel Goldberg
Superintendent of Schools**

**Erica Scudero
Assistant Superintendent**

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Springfield Board of Education
PO Box 210
Springfield, New Jersey 07081

"Cultivating compassionate and extraordinary learners"

Rachel Goldberg
Superintendent of Schools
(973) 376-1025

Michelle Calas
School Business Administrator/
Board Secretary
(973) 376-1025

Resolution: School Government
Introduced By: Mr. Miller
Seconded By: Mrs. Gamarekian
Adopted: July 25, 2022

Curriculum Adoption

To adopt the following curriculum and courses for the 2022-2023 school year:

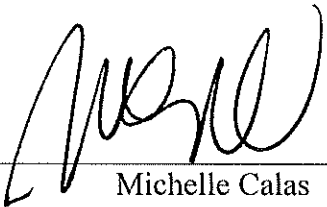
- Revised Elementary Curriculum due to revised state standards.
 - K-5 Social Studies
- Revised Middle School Curriculum due to revised state standards.
 - Grades 6-8 Social Studies
- Revised High School Curriculum due to revised state standards.
 - AP Macroeconomics
 - AP European History
 - AP US Government & Politics
 - AP US History
 - Contemporary Global Studies
 - Diversity Studies
 - Holocaust & Genocide
 - Sociology
 - US History to 1900
 - World History
 - World History Honors
 - 20th Century & Beyond
- Revised Middle School Courses due to new standards in Computer Science
 - PLTW Gateway: Computer Science for Innovators and Makers
 - PLTW Gateway: App Creators
- Revised High School Courses due to new standards in Computer Science
 - Introduction to Java
 - AP Computer Science Principles
 - Advanced Computer Science - Data Structures: Java
- New Elementary Courses
 - Kindergarten Computer Science
 - Grade 1 Computer Science
 - Grade 2 Computer Science
 - Anticipated - moving PLTW Launch down to Grade 3
 - PLTW Launch Grade 4
 - PLTW Launch Grade 5
- New Middle School Elective Course
 - Forensics

- New Elective Courses at FMG
 - Creative Writing
 - Drama/Theater/Playwriting
 - Journalism
 - Mock Trial
 - Model UN
 - Mysteries in History
 - Project Citizen
- New ELA Courses at FMG
 - Accelerated Communication Arts Grade 7
 - Accelerated Communication Arts Grade 8
- New Elective Courses at JDHS:
 - African American Studies

I, Michelle Calas, School Business Administrator/Board Secretary of the Springfield Board of Education, hereby certify that the extract from the minutes of a meeting of the Board of Education duly called and held on July 25, 2022 has been compared by me with the original minute book of said Board of Education, and is a true, complete and exact copy therefor, as far as the same relates to the subject matter referred to said contract.

IN WITNESS THEREOF, I have hereunto set my hand and seal of the Springfield Board of Education, this 26th of July 2022.

SEAL



Michelle Calas
School Business Administrator/Board Secretary



Unit Overview Template

Content Area: Computer Science **Grade Level:** 9-12 **Unit Title:** Basic Programming Constructs

Unit Summary: Students will work with variable types, declarations, initializations, methods, and console output as they begin to survey the basic programming constructs. Pseudocode and iterative thinking are emphasized prior to working with syntax.

Primary Interdisciplinary Connections: *Mathematics*

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☐ ICT Literacy
☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☐ Media Literacy

Unit Rationale: This unit introduces basic programming constructs and concepts used in all programming languages.

Career Readiness (Standard 9):

9.2.12.CAP.3: Investigate how continuing education contributes to one's career and personal growth.

9.2.12.CAP.5: Assess and modify a personal plan to support current interests and postsecondary plans.

9.2.12.CAP.6: Identify transferable skills in career choices and design alternative career plans based on those skills.

9.4.12.CI.1 - Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12.prof.CR3a).

9.4.12.CT.2 - Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12.prof.CR3.a).

9.4.5.CT.3 - Describe how digital tools and technology may be used to solve problems.

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.).

9.4.12.TL.3 - Analyze the effectiveness of the process and quality of collaborative environments.

9.4.2.TL.6 - Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).

Learning Targets

Standards: 8.1.12; A-SSE; F-BF

Content Statements: Algorithms and Programming; Interpret the structure of expressions; Build a function that models a relationship between two quantities.

CPI#:	Cumulative Progress Indicator (CPI):
8.1.12.AP.1	Design algorithms to solve computational problems using a combination of original and existing algorithms.
8.1.12.AP.2	Create generalized computational solutions using collections instead of repeatedly using simple variables.
8.1.12.AP.5	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.



A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .
A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
F-BF.A.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. (+) Compose functions. For example, if $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.
F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals.
SEL.PK-12.4.1	Develop, implement and model effective problem-solving, and critical thinking skills.
SEL.PK-12.5.2	Utilize positive communication and social skills to interact effectively with others.

Unit Essential Questions:

- What is the difference between programming and typing?
- How do you put your program output on the screen?
- How do you store information in a program?
- How do you know what data type to use?

Unit Enduring Understandings:

- Program statements have structure and syntax.
- Different information should be stored in different data types.
- Changing the information stored, changes the results of a program.
- Program output can be sent to the console screen.

Unit Learning Targets:

Students will.... be able to use basic variable types; construct simple methods, and write program statements with console output.



Evidence of Learning

Summative Assessment: Unit test

Equipment Needed: Laptops

Teacher Resources: Laptop and projector

Formative Assessments:

- Student practice worksheets for pseudocode and syntax
- Student practice programs
- Individual programming editing conferences with students
- Students demonstrate programs
- Quizzes



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Lesson Plans

Lesson	Time Frame
Lesson 1 Console Output & Variable Types	2 days
Lesson 2 Strings & Simple String Operations	2 days
Lesson 3 Numeric Types & Operations	2 days

Teacher Notes:

Emphasize the importance of the planning phase using clear pseudocode.

Curriculum Development Resources/Technology Resources:

Click the links below to access additional resources used to design this unit:

<https://www.greenfoot.org/door>

<https://alice.org>

<https://stackoverflow.com/>

<https://www.w3schools.com/java/default.asp>

<https://www.learnjavaonline.org/>



Lesson Plan 1 Template

Content Area: Computer Science Lesson Title: Console Output & Variable Types
 Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☒ ICT Literacy

Interdisciplinary Connections:
 Mathematics

Integration of Technology:
 Computer programming

Equipment Needed:
 Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to declare simple variable types. - be able to initialize simple variable types. - be able to select appropriate simple data types. - be able to determine errors in data type statements. - be able to write simple console output statements.	Lesson Sequence - Students will be asked to analyze a list of examples of variable types, without being given what type each is. - Students then discuss with a partner what the differences are, and notice connections. - The class comes together as a whole to formalize the types, and discuss how to select appropriate simple data types, - Students are given guided practice to determine errors in data type statements. - Students are given an application assignment to	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code



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write simple console
output statements.
6. The teacher observes the
class and meets with
individuals for editing
conferences.

Differentiation:

Programming assignments will be modified for students as needed.

Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



Lesson Plan 2 Template

Content Area: Computer Science Lesson Title: Strings & Simple String Operations
 Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☒ ICT Literacy

Interdisciplinary Connections:
 Mathematics

Integration of Technology:
 Computer programming

Equipment Needed:
 Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to create strings. - be able to find string length. - be able to use string methods. - be able to concatenate strings. - create substrings.	Lesson Sequence - The teacher gives the students code to analyze and discuss with a partner. The code contains operations with strings. - The class comes back together as a whole to formalize the operations with strings. - Students complete guided practice on operations with strings: creating strings, string length, string methods, concatenating strings, and substrings. - Students then work in pairs to complete a program that: creates a	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code



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string, finds its length, concatenates the length, then splits the string into two substrings.

5. The teacher observes the class and meets with individuals for editing conferences.

Differentiation:

Programming assignments will be modified for students as needed.

Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



Lesson Plan 3 Template

Content Area: Computer Science Lesson Title: Numeric Types & Operations Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☐ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☒ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Computer programming

Equipment Needed:

Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to declare and initialize numeric data types. - be able to perform math operations using numeric data types. - be able to find errors related to the use of math order of operations. - be able to use assignment operators. - be able to use compound operations.	Lesson Sequence - Students will review numeric data types. The class will go over how to initialize these data types. - The students will get in pairs to write mathematical algorithms applying the order of operations. - The class will come together to determine how to properly use syntax to create code that applies the order of operation properly. - Students work in pairs again to debug errors in code with respect to order of operation - The teacher observes the class and meets with	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code



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individuals for editing
conferences.

Differentiation:

Programming assignments will be modified for students as needed.

Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



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Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly*, *Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☐	☒	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☐	☒	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☒	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☒	☐	☐

Curriculum Design Template

Content Area: Computer Science **Grade Level:** 10-12 **Unit Title:** Basic Programming Constructs

Created: June 2022

Board Approved on:



Unit Overview Template

Content Area: Computer Science **Grade Level:** 9-12 **Unit Title:** Mixed Data Types & Java Library Classes

Unit Summary: Students will be working with data types, the Java Math library, and keyboard input. Students will be applying these concepts to programs that, for example, complete mathematical algorithms and calculations to solve problems.

Primary Interdisciplinary Connections: *Mathematics*

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☐ ICT Literacy
☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☐ Media Literacy

Unit Rationale: This unit introduces mixed data types and Java library classes.

Career Readiness (Standard 9):

9.2.12.CAP.3: Investigate how continuing education contributes to one's career and personal growth.

9.2.12.CAP.5: Assess and modify a personal plan to support current interests and postsecondary plans.

9.2.12.CAP.6: Identify transferable skills in career choices and design alternative career plans based on those skills.

9.4.12.CI.1 - Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).

9.4.12.CT.2 - Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12prof.CR3.a).

9.4.5.CT.3 - Describe how digital tools and technology may be used to solve problems.

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.).

9.4.12.TL.3 - Analyze the effectiveness of the process and quality of collaborative environments.

9.4.2.TL.6 - Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).

Learning Targets

Standards: 8.1.12; A-SSE; F-BF

Content Statements: Algorithms and Programming; Interpret the structure of expressions; Build a function that models a relationship between two quantities.

CPI#:	Cumulative Progress Indicator (CPI):
8.1.12.AP.1	Design algorithms to solve computational problems using a combination of original and existing algorithms.
8.1.12.AP.2	Create generalized computational solutions using collections instead of repeatedly using simple variables.
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.
A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context.



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	a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.
A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
F-BF.A.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. (+) Compose functions. For example, if $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.
F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals.
SEL.PK-12.4.1	Develop, implement and model effective problem-solving, and critical thinking skills.
SEL.PK-12.5.2	Utilize positive communication and social skills to interact effectively with others.
Unit Essential Questions: • How do you program with mixed data types? • How do you prevent errors with mixed data types? • How do you do complex math operations? • How do you type input into a program?	
Unit Enduring Understandings: • Mixed data types can require additional coding to prevent errors. • Data can be converted from one type to another. • More advanced mathematics can be programmed. • Input from the keyboard can be entered in the program.	
Unit Learning Targets: <i>Students will....</i> be able to use mixed data types and Java library classes when creating programs.	



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Evidence of Learning

Summative Assessment: Unit Test

Equipment Needed: Laptops

Teacher Resources: Laptop and projector

Formative Assessments:

- Student practice worksheets
- Student practice programs
- Individual programming editing conferences with students
- Quizzes



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Lesson Plans

Lesson	Time Frame
Lesson 1 Mixed Data Types	2 days
Lesson 2 The Java Math Library	2 days
Lesson 3 Keyboard Input	2 days

Teacher Notes:

Emphasize the importance of the planning phase using clear pseudocode.

Curriculum Development Resources/Technology Resources:

Click the links below to access additional resources used to design this unit:

<https://www.greenfoot.org/door>

<https://alice.org>

<https://stackoverflow.com/>

<https://www.w3schools.com/java/default.asp>

<https://www.learnjavaonline.org/>



Lesson Plan 1 Template

Content Area: Computer Science Lesson Title: Mixed Data Types Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Computer programming

Equipment Needed:

Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to perform simple operations using mixed data types. - be able to find and correct loss of precision errors. - be able to use casting with mixed data types. - be able to create and use constants. - be able to find and correct data conversion errors.	Lesson Sequence - The class first reviews data types. The students then pair up and determine examples that use mixed data types (e.g. when someone is born, there is a time, place, day of the week, day, month, and year). - The teacher leads the class in discussing mixed data types in Java (string, numeric, arrays). - Students complete guided practice using casting with mixed data types. - Students work on their own or with a group to create and use constants.	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code



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5. The class comes back together to debug data conversion errors.

Differentiation:

Programming assignments will be modified for students as needed.

Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



Lesson Plan 2 Template

Content Area: Computer Science Lesson Title: The Java Math Library Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Computer programming

Equipment Needed:

Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to include the Java Math library. - be able to use Math library constants. - be able to use Math library methods with parameters. - be able to use Math library method return values. - be able to use composite functions with Math library methods.	Lesson Sequence - The students work in pairs to determine an algorithm to raise a number to a power. - The teacher then introduces the students to the Java Math library, and shows students how to use the operations in the library (e.g. the exponent). - Students work in pairs to use the Math library methods with parameters. - The class comes back together to discuss how to use the Math library method return values.	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code
Differentiation: Programming assignments will be modified for students as needed.		



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Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



Lesson Plan 3 Template

Content Area: Computer Science Lesson Title: Keyboard Input Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Computer programming

Equipment Needed:

Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to include the Java Scanner library. - be able to construct Java Scanner objects. - be able to access Java Scanner methods with return types. - be able to use keyboard input in programs. - be able to test program accuracy with multiple keyboard inputs.	Lesson Sequence - Students work to parse strings using their prerequisite knowledge. - The teacher then introduces the Java Scanner library, demonstrating some of the methods. - Students import the library, then apply its methods to parse string inputs. - Students work in pairs on guided practice applying the Scanner library. - The teacher observes the class and meets with individuals for editing conferences.	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code
Differentiation: Programming assignments will be modified for students as needed.		



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Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



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Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly*, *Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☒	☐	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☒	☐	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☒	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☒	☐	☐

Curriculum Design Template

Content Area: Computer Science **Grade Level:** 10-12 **Unit Title:** Mixed Data Types & Java Library Classes

Created: June 2022

Board Approved on:



Unit Overview Template

Content Area: Computer Science **Grade Level:** 10-12 **Unit Title:** Conditional Statements and Program Control

Unit Summary: Students will analyze and apply the boolean operations: and, if, or, switch, and conditional statements. Students will use boolean operations with strings to compare data sets. Students will apply program control to redirect the flow in which a program is compiled.

Primary Interdisciplinary Connections: *Mathematics*

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☐ ICT Literacy
☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☐ Media Literacy

Unit Rationale: This unit introduces conditional statements and program control.

Career Readiness (Standard 9):

- 9.2.12.CAP.3: Investigate how continuing education contributes to one's career and personal growth.
- 9.2.12.CAP.5: Assess and modify a personal plan to support current interests and postsecondary plans.
- 9.2.12.CAP.6: Identify transferable skills in career choices and design alternative career plans based on those skills.
- 9.4.12.CI.1 - Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
- 9.4.12.CT.2 - Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
- 9.4.5.CT.3 - Describe how digital tools and technology may be used to solve problems.
- 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.).
- 9.4.12.TL.3 - Analyze the effectiveness of the process and quality of collaborative environments.
- 9.4.2.TL.6 - Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).

Learning Targets

Standards: 8.1.12; A-SSE; F-BF

Content Statements: Algorithms and Programming; Computing Systems; Interpret the structure of expressions; Build a function that models a relationship between two quantities.

CPI#:	Cumulative Progress Indicator (CPI):
8.1.12.AP.1	Design algorithms to solve computational problems using a combination of original and existing algorithms.
8.1.12.AP.2	Create generalized computational solutions using collections instead of repeatedly using simple variables.
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.
8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation



	details to simplify user experiences.
8.1.12.CS.4	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.
A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .
A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
F-BF.A.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. (+) Compose functions. For example, if $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.
F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals.
SEL.PK-12.4.1	Develop, implement and model effective problem-solving, and critical thinking skills.
SEL.PK-12.5.2	Utilize positive communication and social skills to interact effectively with others.

Unit Essential Questions:

- What are boolean values and how do they work in truth tables?
- What are boolean operations?
- How can boolean expressions be evaluated?
- What is a conditional statement and how is one used?

Unit Enduring Understandings:

- Boolean truth tables present the results of boolean operations.
- Boolean types have their own operations.
- Simple or complex boolean conditions can be evaluated,
- Boolean conditions can control program results.

Unit Learning Targets:



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*Students will....*be able to create and evaluate conditional statements and program control.



Evidence of Learning

Summative Assessment: Unit Test

Equipment Needed: Laptops

Teacher Resources: Laptop, projector

Formative Assessments:

- Student practice worksheets
- Student practice programs
- Individual programming editing conferences with students
- Quizzes



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Lesson Plans

Lesson	Time Frame
Lesson 1 Boolean Type & Boolean Operations	2 days
Lesson 2 If Conditional Statements	2 days
Lesson 3 Switch Conditional Statements	2 days

Teacher Notes:

Emphasize the importance of the planning phase using clear pseudocode.

Curriculum Development Resources/Technology Resources:

Click the links below to access additional resources used to design this unit:

<https://www.greenfoot.org/door>

<https://alice.org>

<https://stackoverflow.com/>

<https://www.w3schools.com/java/default.asp>

<https://www.learnjavaonline.org/>



Lesson Plan 1 Template

Content Area: Computer Science Lesson Title: Boolean Type & Boolean Operations Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:
 Mathematics

Integration of Technology:
 Computer programming

Equipment Needed:
 Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to declare and use boolean types. - be able use boolean operations with truth tables. - be able to use operator precedence with boolean operation. - be able to evaluate boolean conditional statements. - be able to determine equivalent boolean statements.	Lesson Sequence - Students will determine the possible truth values for a set of statements. Discuss how each can only be true or false. - Define these as boolean values, then apply these values to a truth table. Add additional columns to the table with connectives (and, not, or). - Students complete guided practice on evaluating conditional statements. - Students will then work in pairs to determine equivalent boolean statements. The class	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code



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comes together to
discuss.

Differentiation:

Programming assignments will be modified for students as needed.

Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



Lesson Plan 2 Template

Content Area: Computer Science Lesson Title: If Conditional Statements Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Computer programming

Equipment Needed:

Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to use boolean conditions with if statements. - be able to use if statements for program branching. - be able to use multiple conditional statements with if or if statements. - be able to test if statements for logical errors. - be able to use else statements to prevent run-time errors.	Lesson Sequence - Students create a truth table, including the conditional if statement. The class discusses the different truth values using examples. - The teacher leads the class in how to use if statements for program branching. - Students apply multiple conditional statements with if, then check their code against each other. - The teacher observes the class and meets with individuals for editing conferences.	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code
Differentiation: Programming assignments will be modified for students as needed.		



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Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



Lesson Plan 3 Template

Content Area: Computer Science Lesson Title: Switch Conditional Statements Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:
 Mathematics

Integration of Technology:
 Computer programming

Equipment Needed:
 Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to appropriate data types with switch statements. - be able to use switch statements for program branching. - be able to use break and default statements to prevent run-time errors. - be able to test switch statements for logical errors. - be able to convert between if and switch conditional statements.	Lesson Sequence - Students create a truth table, including the switch statement. The class discusses the different truth values using examples. - The teacher leads the class in how to use switch statements for program branching. - Students apply multiple switch statements, then check their code against each other. - The class comes together to test switch statements for logical errors, the converts between if and switch.	- Student practice programs - Programming editing conferences with student - Students design solutions Students test and demonstrate code



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- | | | |
|--|---|--|
| | 5. The teacher observes the class and meets with individuals for editing conferences. | |
|--|---|--|

Differentiation:

Programming assignments will be modified for students as needed.

Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



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Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly, Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☐	☒	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☐	☐	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☐	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☒	☐	☐

Curriculum Design Template

Content Area: Computer Science **Grade Level:** 10-12 **Unit Title:** Conditional Statements and Program Control

Created: June 2022

Board Approved on:



Unit Overview Template

Content Area: Computer Science	Grade Level: 10-12	Unit Title: Looping
Unit Summary: Students will discover and apply different types of loops to their programs: For Loops, While Loops, Do...While Loops. Students will analyze the different types of loops and determine which works best in certain situations to optimize a program.		
Primary Interdisciplinary Connections: <i>Mathematics</i>		
21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☐ ICT Literacy ☒ Information Literacy ☒ Life and Career Skills ☐ Communication and Collaboration ☐ Media Literacy		
Unit Rationale: This unit will introduce looping techniques, which are used in all programming languages.		
Career Readiness (Standard 9): 9.2.12.CAP.3: Investigate how continuing education contributes to one's career and personal growth. 9.2.12.CAP.5: Assess and modify a personal plan to support current interests and postsecondary plans. 9.2.12.CAP.6: Identify transferable skills in career choices and design alternative career plans based on those skills. 9.4.12.CI.1 - Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a). 9.4.12.CT.2 - Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a). 9.4.5.CT.3 - Describe how digital tools and technology may be used to solve problems. 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.). 9.4.12.TL.3 - Analyze the effectiveness of the process and quality of collaborative environments. 9.4.2.TL.6 - Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).		

Learning Targets

Standards: 8.1.12; A-SSE; F-BF	
Content Statements: Algorithms and Programming; Computing Systems; Interpret the structure of expressions; Build a function that models a relationship between two quantities.	
CPI#:	Cumulative Progress Indicator (CPI):
8.1.12.AP.1	Design algorithms to solve computational problems using a combination of original and existing algorithms.
8.1.12.AP.2	Create generalized computational solutions using collections instead of repeatedly using simple variables.
8.1.12.AP.3:	Select and combine control structures for a specific application based upon performance and readability, and identify trade-offs to justify the choice.
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.
8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.
8.1.12.CS.4	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.
A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .
A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
F-BF.A.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. (+) Compose functions. For example, if $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.
F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals.
SEL.PK-12.4.1	Develop, implement and model effective problem-solving, and critical thinking skills.
SEL.PK-12.5.2	Utilize positive communication and social skills to interact effectively with others.

Unit Essential Questions:

- What is the purpose of a loop?
- How do boolean conditional statements control loops?
- If your program needs a loop, how do you know which type to use?

Unit Enduring Understandings:

- Different loop structures can be chosen for different purposes.
- It is possible to follow and trace loop output.
- Loops can be converted from one format to another.
- Boolean conditions can control loops.

Unit Learning Targets:

Students will....be able to create, evaluate, and use looping techniques.



Evidence of Learning

Summative Assessment: Unit Test

Equipment Needed: Laptops

Teacher Resources: Laptop, projector

Formative Assessments:

- Student practice worksheets
- Student practice programs
- Individual programming editing conferences with students
- Quizzes



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Lesson Plans

Lesson	Time Frame
Lesson 1 For Loops	2 days
Lesson 2 While Loops	2 days
Lesson 3 Do...While Loops	2 days

Teacher Notes:

Emphasize the importance of the planning phase using clear pseudocode.

Curriculum Development Resources/Technology Resources:

Click the links below to access additional resources used to design this unit:

<https://www.greenfoot.org/door>

<https://alice.org>

<https://stackoverflow.com/>

<https://www.w3schools.com/java/default.asp>

<https://www.learnjavaonline.org/>



Lesson Plan 1 Template

Content Area: Computer Science Lesson Title: For Loops Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Computer programming

Equipment Needed:

Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to use boolean conditions with for loops. - be able to trace the output of a for loop. - be able to traverse using a for loop. - be able to use for loops for repetitive statements. - be able to find and correct logical or run-time errors in for loops.	Lesson Sequence - Have students write pseudocode for approaching a stoplight using a for loop. - As a class, discuss how to insert a boolean value to the stoplight pseudocode. Trace the output for the loop. - Students then write a for loop to repeat a statement. - The teacher observes the class and meets with individuals for editing conferences. - As a whole class, at the end, debug run-time errors in several for loop examples.	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code
Differentiation: Programming assignments will be modified for students as needed.		
Resources Provided: - Laptop - Java programming language - Java index of source code libraries		



Lesson Plan 2 Template

Content Area: Computer Science Lesson Title: While Loops Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Computer programming

Equipment Needed:

Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to trace the output of a while loop. - be able to use boolean conditions with while loops. - be able to use while loops to rerun programs. - be able find and correct logical or run-time errors in while loops. - be able to convert loop structures from for loops to while loops.	Lesson Sequence - Have students write pseudocode for approaching a stoplight using a while loop. - As a class, discuss how to insert a boolean value to the stoplight pseudocode. Discuss how a while loop would rerun the approach. - Students then write a while loop to repeat a statement. - The teacher observes the class and meets with individuals for editing conferences. - As a whole class, at the end, debug run-time	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code



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errors in several while
loop examples.

Differentiation:

Programming assignments will be modified for students as needed.

Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries



Lesson Plan 3 Template

Content Area: Computer Science Lesson Title: Do...While Loops Time Frame: 2 days

Lesson Components

21st Century Themes

- ☐ Global Awareness ☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☐ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Computer programming

Equipment Needed:

Laptops

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - be able to trace the output of a do...while loop. - be able to use boolean conditions with do...while loops. - be able to use do...while loops to rerun programs. - be able find and correct logical or run-time errors in do...while loops. - be able to convert loop structures from do...while to while loops.	Lesson Sequence - Have students write pseudocode for approaching a stoplight using a do...while loop. - As a class, discuss how to insert a boolean value to the stoplight pseudocode. Discuss how a do...while loop would rerun the approach. - Students then write a do...while loop to repeat a statement. - The teacher observes the class and meets with individuals for editing conferences. - As a whole class, at the end, debug run-time errors in several do...while loop examples.	- Student practice programs - Programming editing conferences with student - Students design solutions - Students test and demonstrate code



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Differentiation:

Programming assignments will be modified for students as needed.

Resources Provided:

- Laptop
- Java programming language
- Java index of source code libraries

Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly, Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☐	☒	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☐	☒	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☒	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☒	☐	☐

Curriculum Design Template

Content Area: Computer Science **Grade Level:** 10-12 **Unit Title:** Looping

Created: June 2022

Board Approved on:



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GLOBAL SKILLS

IEP AND 504 ACCOMMODATIONS AND MODIFICATIONS FOR EARLY CHILDHOOD AND ELEMENTARY SCHOOL STUDENTS:

Large print textbooks
Textbooks for at-home use
Additional time for assignments
Review of directions
Use of mnemonics
Have student restate information
Concrete examples
Adaptive writing utensils
Support auditory presentations with visuals
Use of a study carrel
Assistance in maintaining uncluttered space
Weekly home-school communication tools (notebook, daily log, phone calls or email messages)
Space for movement or breaks
Study sheets and teacher outlines
Extra visual and verbal cues and prompts
Math sheets with highlighted instructions
Graph paper to assist in organizing or lining up math problems
Use of computers and calculators
Books on tape
Graphic organizers
Quiet corner or room to calm down and relax when anxious
Preferential seating
Alteration of the classroom arrangement
Reduction of distractions
Answers to be dictated
Hands-on activities
Use of manipulatives
No penalty for spelling errors or sloppy handwriting
Follow a routine/schedule
Alternate quiet and active time
Teach time management skills
Rest breaks
Verbal and visual cues regarding directions and staying on task
Agenda book and checklists
Adjusted assignment timelines
Visual daily schedule



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GLOBAL SKILLS**

Varied reinforcement procedures
Immediate feedback
Work-in-progress check
Personalized examples

TESTING AND ASSESSMENT ACCOMMODATIONS AND MODIFICATIONS:

Answers to be dictated
Frequent rest breaks
Additional time
Oral testing
Untimed tests
Choice of test format (multiple-choice, essay, true-false)
Alternate ways to evaluate (projects or oral presentations instead of written tests)
Accept short answers
Open-book tests
Read test and directions to student
Provide study outline prior to tests
Highlight key directions
Test in alternative site
Use of calculator
Extra credit option
Preview test procedures
Simplified test wording; rephrased test questions and/or directions

GENERAL ACCOMMODATIONS AND MODIFICATIONS:

Use of alternative books or materials on the topic being studied
Computerized spell-check support
Word bank of choices for answers to test questions
Provision of calculator and/or number line for math tests
Reworded questions in simpler language
Projects instead of written reports
Highlighting important words or phrases in reading assignments
Modified workload or length of assignments/tests
Modified time demands
Modified grades based on IEP

BEHAVIOR ACCOMMODATIONS MODIFICATIONS:



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GLOBAL SKILLS**

Breaks between tasks
Cue expected behavior
Daily feedback to student
Have contingency plans
Use de-escalating strategies
Use positive reinforcement
Use proximity/touch control
Use peer supports and mentoring
Model expected behavior by adults
Have parent sign homework
Have parent sign behavior chart
Set and post class rules
Chart progress and maintain data



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GLOBAL SKILLS

IEP AND 504 ACCOMODATIONS AND MODIFICATIONS FOR MIDDLE AND HIGH SCHOOL STUDENTS:

Large print textbooks
Textbooks for at-home use
Additional time for assignments
A locker with adapted lock
Review of directions
Review sessions
Use of mnemonics
Have student restate information
Provision of notes or outlines
Concrete examples
Adaptive writing utensils
Support auditory presentations with visuals
Weekly or bi-weekly home-school communication
Space for movement or breaks
Study sheets and teacher outlines
Extra visual and verbal cues and prompts
Lab and math sheets with highlighted instructions
Graph paper to assist in organizing or lining up math problems
Use of tape recorder for lectures
Use of Interactive notebook
Use of a scribe
Use of computers and calculators
Books on tape
Graphic organizers
Quiet corner or room to calm down and relax when anxious
Preferential seating
Alteration of the classroom arrangement
Reduction of distractions
Answers to be dictated
Hands-on activities
Ability to type all assignments
Follow a routine/schedule
Teach time management and organizational skills
Rest breaks
Verbal and visual cues regarding directions and staying on task
Agenda book and checklists
Daily check-in with case manager or special education teacher
Adjusted assignment timelines
Visual daily schedule



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**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY
GLOBAL SKILLS**

Varied reinforcement procedures
Immediate feedback
Work-in-progress check
Personalized examples

TESTING AND ASSESSMENT ACCOMMODATIONS AND MODIFICATIONS:

Answers to be dictated
Frequent rest breaks
Additional time
Oral testing
Choice of test format (multiple-choice, essay, true-false)
Alternate ways to evaluate (projects or oral presentations instead of written tests)
Accept short answers
Open-book or open-note tests
Read test and directions to student
Provide study guides prior to tests
Highlight key directions
Test in alternative site
Use of calculator
Extra credit option
Pace long-term projects
Preview test procedures
Simplified test wording; rephrased test questions and/or directions

GENERAL ACCOMMODATIONS AND MODIFICATIONS:

Allow outlining, instead of writing for an essay or major project
Use of alternative books or materials on the topic being studied
Computerized spell-check support
Word bank of choices for answers to test questions
Provision of calculator for math tests
Film or video supplements in place of reading text
Reworded questions in simpler language
Projects instead of written reports
Highlighting important words or phrases in reading assignments
Modified workload or length of assignments/tests
Modified time demands



SPRINGFIELD PUBLIC SCHOOLS

**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY
GLOBAL SKILLS**

Pass/no pass option
Modified grades based on IEP

BEHAVIOR ACCOMMODATIONS FOR STUDENTS:

- Breaks between tasks
- Cue expected behavior
- Daily feedback to student
- Have contingency plans
- Use de-escalating strategies
- Use positive reinforcement
- Use proximity/touch control
- Use peer supports and mentoring
- Model expected behavior by adults
- Have parent sign homework
- Set and post class rules
- Chart progress and maintain data



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Accommodations and Modifications for ESL Students

- Give tests orally
- Give instructions/directions in writing and orally
- Assign a peer tutor, same language or English speaking
- Allow use of bilingual/translation dictionary
- Provide summaries of text or study guides of particular chapters
- Allow errors in speaking
- Allow errors in writing
- Accept writing in first language
- Highlight key vocabulary
- Reduce amount of work required
- Assess comprehension through demonstration or other alternative means (gestures, drawings)
- Rephrase questions, directions, and explanations
- Reduce multiple choices on assessments
- Provide study guides and/ or outlines
- Shorten reading assignments
- Allow extended time for test/project completion
- Use of audio books
- Use of graphic organizers
- Use reduced text, so that print is not dense
- Use visuals/pictures throughout lesson/unit/assignment
- Adapt homework to reflect language proficiency/home support
- Adapt homework to reflect home support
- Provide hands-on activities and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Use of translation dictionaries to locate words in the native language
- Use anecdotal records and portfolio of work as forms of assessment
- Use story retellings to assess comprehension