

ROBBINSVILLE PUBLIC SCHOOLS
OFFICE OF CURRICULUM AND INSTRUCTION
Technology Department

Computer Science II (Semester)
Grades 9-12

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BOARD OF EDUCATION INITIAL ADOPTION DATE:

Course Philosophy

This course is designed to provide students with an enriched study of concepts in programming in the Java language. Students will be required to continually and consistently analyze and interpret various applications in order to become effective programmers. Students will be taught to use problem solving techniques. They will become an efficient programmer as they graduate from this class.

Course Description

Computer Science -II introduces students to programming using Java language. The logical reasoning and programming skills that they learned from Python language are emphasized in this course. This course teaches them one concept at time, layering previous concepts from before. This would also prepare them to take AP Computer Science A course.

Core and Supplemental Instructional Materials

| Core Materials | Supplemental Materials |
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| <ul style="list-style-type: none">● Think Java: How to Think Like a Computer Scientist by Allen Downey & Chris Mayfield(Green Tea Press)● Introduction to Java from www.codehs.com | <ul style="list-style-type: none">● Online references: http://greenteapress.com/thinkjava6/thinkjava.pdf● Classroom Textbook references |

Integration of 21st Century Themes and Skills

| Educational Technology |
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| Standards: (8.1.12.A.3, 8.1.12.B.2) |
| <ul style="list-style-type: none">● <u>Technology Operations and Concepts:</u> Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue. <u>Example:</u> Students can use codehs.com website in learning the content and solving a problem using the coding language, Python. |
| <ul style="list-style-type: none">● <u>Creativity and Innovation:</u> Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology. <u>Example:</u> Students will be creating an online game using the previously learned content in Python Language. |

Career Ready Practices

Standards: (List number: CRP2, CRP9)

CRP2: Apply appropriate academic and technical skills. Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation

Example: Students will be using the problem-solving skills they learned in Math in order to solve a problem in hand. Students will be asked to break down a bigger problem in to smaller tasks in order to tackle the problem.

CRP9: Model integrity, ethical leadership and effective management. Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' action, attitudes and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture.

Example: Students will understand the integrity of writing codes on their own and not rely on online resources in finding a solution to a problem. Students will understand copying code from an online resource is called plagiarism.

Robbinsville Ready 21st Century Skill Integration

The following skills will be embedded throughout the curriculum and instruction of this course.

Collaborative Team Member: Robbinsville students will learn more by working together than in isolation. As educational theorist Lev Vygotsky advocated, learning is a social process. Many workplaces today encourage employees to work in teams to solicit diverse perspectives, brainstorm new ideas and/or products, and solve problems. Further, collaboration fosters interpersonal relationships, self-management skills, cooperation, and a sense of collective responsibility. Collaborative team members are able to work with diverse groups of people who hold a variety of perspectives.

Effective Communicator: Robbinsville students must be able to clearly articulate their ideas orally, in writing, and across various media in order to successfully connect to the world around them. As the world becomes increasingly globalized, communication is more than just sharing one's ideas. Effective communicators are able to communicate their convictions, actively listen and analyze others' work to identify perspective and/or potential bias.

Emotionally Intelligent Learner: Robbinsville students who are emotionally intelligent learn to be empathetic, demonstrate integrity and ethical behavior, are kind, are self-aware, willing to change, and practice self-care. They are better able to cope with the demands of the 21st century digital society and workplace because they are reliable, responsible, form stable and healthy relationships, and seek to grow personally and professionally. Emotionally intelligent people are able to manage their emotions, work effectively on teams and are leaders who can grow and help to develop others.

Informed and Involved Citizen: Robbinsville students need to be digital citizens who are civically and globally aware. The concept of what it means to be "literate" has evolved along with 21st century technological and cultural shifts. Our progressive vision of literacy entails having our students explore real world problems in the classroom. Informed and involved citizens are able to safely and accurately communicate with people all around the world and are financially, environmentally and informationally literate.

Innovative Thinker: Robbinsville students must encompass innovative thinking skills in order to be successful lifelong learners in the 21st century world. As stated by Karl Fisch and Scott McLeod in the short film Shift Happens, "We are currently preparing students for jobs that don't yet exist . . . using technologies that haven't been invented . . . in order to solve problems we don't even know are problems yet." Innovative thinkers are able to think analytically, solve problems critically, creatively engage in curiosity and tinkering, and demonstrate originality.

Resilient and Self-Directed Learner: Robbinsville students need to take risks and ultimately make independent and informed decisions in an ever-changing world. Author of *Life, the Truth, and Being Free*, Steve Maraboli stated, “Life doesn’t get easier or more forgiving, we get stronger and more resilient.” Self-directed scholars of the 21st century are able to set goals, initiate resolutions by seeking creative approaches, and adjust their thinking in light of difficult situations. Resilient students are able to take risks without fear of failure and overcome setbacks by utilizing experiences to confront new challenges. Resilient and self directed scholars will consistently embrace opportunities to initiate solutions and overcome obstacles.

Robbinsville Public Schools
Scope, Sequence, Pacing and Assessment

Computer Science – II

| Unit Title | Unit Understandings and Goals | Recommended Duration/ Pacing | Assessments | | | |
|-----------------------------------|---|---------------------------------|---|--------------------------------------|--|--|
| | | | Formative | Summative | Common Benchmark Assessments (mid-course and end of course <u>only</u>) | Alternative Assessments (projects, etc. when appropriate) |
| Unit 1: Intro to Java programming | <ul style="list-style-type: none"> ● Intro to Eclipse IDE ● How to write Debug a program in Java? ● Vocab Words | 1 week | To understand students' understanding, students will write program and execute them as they learn a new command | Quiz | Final Project | Programming Assignment. "Think Java" Page 12, Ex.1-3 |
| Unit 2: Variables/ Operators | <ul style="list-style-type: none"> ● Declaring/ Assigning/ Printing Variables ● Arithmetic Operators ● Floating Point / Rounding ● Operators for String ● Types of Errors ● Vocab words | 1-2 weeks | To understand students' understanding, students will write program and execute them as they learn a new command | Programming Assignment/ Unit Test | Final Project | Programming Assignment. "Think Java" page 27, Ex 2-3 |

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|-----------------------------------|---|-----------|---|------------------------------------|---------------|---|
| Unit 3: Input/ Output | <ul style="list-style-type: none"> ● Scanner Class ● Literal / Constant Variables ● Printf ● Vocab Words | 1 week | To understand students' understanding, students will write program and execute them as they learn a new command | Quiz | Final Project | Programming Assignment. "Think Java" Page 41, Ex 3-4 |
| Unit 4: Methods | <ul style="list-style-type: none"> ● Math Methods ● Add / Write new Methods ● Flow of Execution ● Parameters ● JavaDocs ● Vocab Words | 1-2 weeks | To understand students' understanding, students will write program and execute them as they learn a new command | Programming Assignment / Unit Test | Final Project | Programming Assignment. "Think Java" Page 56, Ex.4-3 |
| Unit 5: Conditionals/ Logic | <ul style="list-style-type: none"> ● Relational Operators ● Logical Operators ● Conditional Statements ● Nested Conditional Statements ● Boolean Variable ● Validating Input ● Intro to Recursive ● Vocab Words | 1-2 weeks | To understand students' understanding, students will write program and execute them as they learn a new command | Programming Assignment / Unit Test | Final Project | Programming Assignment. "Think Java" Page 70, Ex.5-7 |
| Unit 6: Value Methods | <ul style="list-style-type: none"> ● Return Value ● Writing a Method w/ return value ● Overloading ● Boolean Method ● More Recursion ● Vocab Words | 1-2 weeks | To understand students' understanding, students will write program and execute them as they learn a new command | Programming Assignment / Unit Test | Final Project | Programming Assignment. "Think Java" Page 86, Ex. 6-6 /6-7 |

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| Unit 7: Loops | <ul style="list-style-type: none"> • While Loop • For Loop • do-while loop • Break and Continue • Vocab Words | 2 weeks | To understand students' understanding, students will write program and execute them as they learn a new command | Programming Assignment / Unit Test | Final Project | Programming Assignment. "Think Java", Page 100 / Ex.7-2 |
| Unit 8: Arrays | <ul style="list-style-type: none"> • Creating Arrays • Accessing Arrays • Printing Arrays • Array Traversal • Vocab Words | 1 week | To understand students' understanding, students will write program and execute them as they learn a new command | Quiz | Final Project | Programming Assignment. "Think Java" Page 115, Ex. 8-6/8-7 |
| Unit 9: Strings | <ul style="list-style-type: none"> • Primitive Data Type: character • Immutable • String Traversal • String Methods • Wrapper Class • Vocab Words | 1-2 weeks | To understand students' understanding, students will write program and execute them as they learn a new command | Programming Assignment / Unit Test | Final Project | Programming Assignment. "Think Java" Page 127, Ex. 9-4 |
| Unit 10: Intro to Object Oriented Programming | <ul style="list-style-type: none"> • Classes <ul style="list-style-type: none"> ○ Constructors ○ Getters / Setters ○ Writing Methods ○ Overloading Methods • Create Objects using class <ul style="list-style-type: none"> ○ Variable Visibility ○ Using Methods from class • Differences between Overloading / Overriding | 2 weeks | To understand students' understanding, students will write program and execute them as they learn a new command | Programming Assignment | Final Project | Programming Assignment. "Think Java" Page 158 / Ex 11-4 / 11-5 |

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Robbinsville Public Schools
Unit #1: Introduction to Java

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| Enduring Understandings: <ul style="list-style-type: none"> ● Intro to Eclipse IDE ● How to write Debug a program in Java? ● Vocab Words | Essential Questions: <ul style="list-style-type: none"> ● What is Java? ● How to write a Java program? ● How to use Eclipse in writing / executing a Java program? |
| <p style="text-align: center;">Interdisciplinary Connection</p> <p style="text-align: center;">ELA: NJSLSA.W8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism</p> <p>Example: When students are asked to do a research project, the online content that they use should be checked for copyrights. Just like this, when students are asked to write a program to solve a problem, they should think about using their knowledge of content in solving, but not copying code from an online resource.</p> | |

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| Guiding / Topical Questions with Specific Standards | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |
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| 9.3.IT- PRG.1, 8.2.12.E | Why Java Language? | Students learned Python in the previous course. But they will be given introduction to why to learn Java? | Class discussion / research | Various online resource | Make a presentation to share their ideas in front of the class |
| 9.3.IT- PRG.1, 8.2.12.E | How to use Eclipse? | Introducing Eclipse as an IDE | Demonstration of Eclipse IDE to create/ execute a Java program | Eclipse IDE | Create a “Hello World” project and Write a sample. |

Robbinsville Public Schools
Unit #2: Variables/ Operators

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| Enduring Understandings: <ul style="list-style-type: none"> • Declaring/ Assigning/ Printing Variables • Arithmetic Operators • Floating Point / Rounding • Operators for String • Types of Errors • Vocab words | Essential Questions: <ul style="list-style-type: none"> • Like Math, how variables are used in Java program? • What are the different types of variables? • How different are the arithmetic operators in Java? • What kinds of errors you may encounter in Java and how to solve them? |
| <p style="text-align: center;">Interdisciplinary Connection</p> <p style="text-align: center;">N -Q-A: Reason quantitatively and use units to solve problems. Example: Students will be creating and using variables in their programs</p> | |

| Guiding / Topical Questions with Specific Standards | | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |
|---|---|---|---|---------------------------------------|---|
| 9.3.IT-PRG.1, 8.2.12.E | How to use Variables in Java? | Declaring/ Assigning / Printing Variables in Java | Connecting to Python and its Variables. | “Think Java” Chapter 2 | Written Tests and Quizzes Programming assessment for the topic Debug a program to find errors |
| 9.3.IT-PRG.1, 8.2.12.E | How different are the arithmetic operators in Java? | Operators like +, -, *, /, %, etc. Using Floating Point Variable / Rounding String Operators | Demonstrating different operators and how they are used in Java | “Think Java” Chapter 2 | |

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| 9.3.IT- PRG.1, 8.2.12.E | What kinds of errors you may encounter in Java and how to solve them? | Types of Errors: Compile Time, Run Time, Parsing, Logic Errors, etc. | Demonstrating by showing errors in a program and students take turn in fixing them. | “Think Java” Chapter 2 | |
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Robbinsville Public Schools
Unit #3: Input/ Output

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| Enduring Understandings: <ul style="list-style-type: none"> ● Scanner Class ● Literal / Constant Variables ● Printf ● Vocab Words | Essential Questions: <ul style="list-style-type: none"> ● How to get user input of different variable types? ● When solving Math problems, what to do when we come across constants like PI ● When using print statement, is there an option to easily format the output that we want to print? |
| <p style="text-align: center;">Interdisciplinary Connection</p> <p style="text-align: center;">F-IF: Interpreting Functions</p> <p style="text-align: center;">Example: Like in a function when a value of x changes, changes value of y, in Java, when writing a program user may have to enter the value. Depending on the value entered by the user, the output may change.</p> | |

| Guiding / Topical Questions with Specific Standards | | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |
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| 9.3.IT- PRG.1, 8.2.12.E | How to get user input of different variable types? | java.util.Scanner (Scanner Class) nextLine, nextInt, nextDouble etc | Demonstrating how to use Scanner method in writing a program | “Think Java” Chapter 3 | Written Tests and Quizzes Programming assessment for the |

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| 9.3.IT-PRG.1, 8.2.12.E | When solving Math problems, what to do when we come across constants like PI | Declaring a constant variable | Demonstrating a good practice of why to use constants | “Think Java” Chapter 3 | topic Debug a program to find errors |
| 9.3.IT-PRG.1, 8.2.12.E | When using print statement, is there an option to easily format the output that we want to print? | System.out.printf | Class discussion on effective use of printf than println/print? | “Think Java” Chapter 3 | |

Robbinsville Public Schools
Unit #4: Methods

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| Enduring Understandings: <ul style="list-style-type: none"> • Math Methods • Add / Write new Methods • Flow of Execution • Parameters • JavaDocs • Vocab Words | Essential Questions: <ul style="list-style-type: none"> • When solving Math expressions, what methods are available in Java to use? • How to write /call a method of our own? • How will the flow of execution be affected when calling a method? • How are parameters used when writing a method? • Why is it important to use JavaDocs when writing a program? |
| <p style="text-align: center;">Interdisciplinary Connection</p> <p style="text-align: center;">Math: F-IF/F-BF: Functions</p> <p style="text-align: center;">Example: Students will be writing functions in the program which has the similar connection to the Functions in Math. Parameters are the values of x and return value from the function is value of y.</p> | |

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| Guiding / Topical Questions with Specific Standards | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |
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| 9.3.IT-PRG.1, 8.2.12.E | When solving Math expressions, what methods are available in Java to use? | java.lang.Math: sqrt, sin, cos, tan, toDegrees, toRadians, PI, round, etc | Demonstrating the uses of the Math methods | “Think Java” Chapter 4 | <p>Written Tests and Quizzes</p> <p>Programming assessment for the topic</p> <p>Debug a program to find errors</p> |
| 9.3.IT-PRG.1, 8.2.12.E | How to write /call a method of our own? | <p>Writing a method.</p> <p>Calling a method that user writes.</p> <p>Traversing through the program to understand the flow of execution.</p> <p>Passing the Variables as parameters and using them in the method.</p> | Demonstrating best practices on how to write a method. Students making a poster traversing through the program. | “Think Java” Chapter 4 | |
| 9.3.IT-PRG.1, 8.2.12.E | Why is it important to use JavaDocs when writing a program? | Adding comments and documents as the programmer writes the program. | Demonstrating Best practices of writing an elaborate “JavaDocs” | “Think Java” Chapter 4 | |

Robbinsville Public Schools
Unit #5: Conditionals and Logic

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| Enduring Understandings: <ul style="list-style-type: none">● Relational Operators● Logical Operators● Conditional Statements● Nested Conditional Statements● Boolean Variable● Validating Input● Intro to Recursive● Vocab Words | Essential Questions: <ul style="list-style-type: none">● When using conditional statements, what relational and logical operators are available in Java?● Can a if-statement be used inside another if-statement?● What are Boolean values?● How to validate an input given by the user?● Can you call the same method inside that method? | | | |
| <div>Interdisciplinary Connection</div> <div>Math: S-CP: Conditional Probability and the Rules of Probability</div> <div>Examples: Students will be using Venn diagram to understand AND / OR/ NOT operators which will be used in writing conditional statements.</div> | | | | |
| Guiding / Topical Questions with Specific Standards | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |

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| 9.3.IT-PRG.1, 8.2.12.E | When using conditional statements, what relational and logical operators are available in Java? | Using if statements with relational and logical operators Using if statement inside another one | Connecting to Python, students will be working in a group in brainstorming how to use logical and relational operators in Java | “Think Java” Chapter 5 | <p>Written Tests and Quizzes</p> <p>Programming assessment for the topic</p> <p>Debug a program to find errors</p> |
| 9.3.IT-PRG.1, 8.2.12.E | How do you translate yes/no answers in to a Java language code? | Introducing Boolean values (TRUE, FALSE) and how we use them in conditional statements | Demonstrate the uses of Boolean Value in a conditional statement. | “Think Java” Chapter 5 | |
| 9.3.IT-PRG.1, 8.2.12.E | How to validate an input given by the user? | Validating an input from the user. Using conditional statements to validate the input | Understanding why to validate the input along with creating an error when the programmer does not validate | “Think Java” Chapter 5 | |
| 9.3.IT-PRG.1, 8.2.12.E | What is Recursion? | Tracing a program that uses recursion Understanding the flow of execution Writing a program that uses recursion. | Make a poster in traversing through a recursion program to understand the flow of execution | “Think Java” Chapter 5 | |

Robbinsville Public Schools
Unit #6: Value Methods

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| Enduring Understandings: <ul style="list-style-type: none">● Return Value● Writing a Method w/ return value● Overloading● Boolean Method● More Recursion● Vocab Words | Essential Questions: <ul style="list-style-type: none">● When a method is called, how does it communicate with the calling method?● Can 2 methods have the same name? | | | |
| <div>Interdisciplinary Connection</div> <div>Math: F-IF/F-BF: Functions</div> <div>Example: Students will be writing functions in the program which has the similar connection to the Functions in Math. Parameters are the values of x and return value from the function is value of y.</div> | | | | |
| Guiding / Topical Questions with Specific Standards | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |

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| 9.3.IT-PRG.1, 8.2.12.E | How to return a value (any data type) from the method back to the calling method? | Using “return” when writing a method. Using returned values in the calling method. Returning Boolean values | In chapter 4, students used parameters to pass the value to the method. Students will be introduced how to communicate back to the calling method. | “Think Java” Chapter 6 | Written Tests and Quizzes Programming assessment for the topic Debug a program to find errors |
| 9.3.IT-PRG.1, 8.2.12.E | Can 2 methods have the same name? | Overloading: When 2 methods have the same name but different parameters and return values | Demonstrating this using Shapes and Area. | “Think Java” Chapter 6 | |
| 9.3.IT-PRG.1, 8.2.12.E | How to write recursion using return value? | Traversing through the recursion program that returns a value to the calling method. Writing a recursion program that returns a value | Making a poster understanding the recursion with the use of the return value | “Think Java” Chapter 6 | |

Robbinsville Public Schools
Unit #7: Loops

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| Enduring Understandings: <ul style="list-style-type: none"> • While Loop • For Loop • do-while loop • Break and Continue • Vocab Words | Essential Questions: <ul style="list-style-type: none"> • What are different Kinds of loops in Java • How to break out a loop or continue without breaking? |
| <p style="text-align: center;">Interdisciplinary Connection</p> <p style="text-align: center;">Music: 1.3.2.B.5 Reading notations with Repeat symbol on it.</p> <p>Examples: Students are writing a program with the same concept of using repeat while reading music and playing their instrument. While loop is the example when the students are asked to repeat a certain piece until the conductor says to break and continue after the repeat.</p> | |

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| Guiding / Topical Questions with Specific Standards | | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |
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| 9.3.IT-PRG.1, 8.2.12.E | While and do-While? What are the differences and similarities? | Traversing through While and do-while loops Writing program using the loops | Extending on validating user input from chapter 5 with using while and do while loops | “Think Java” Chapter 7 | Written Tests and Quizzes Programming assessment for the topic Debug a program to find errors |
| 9.3.IT-PRG.1, 8.2.12.E | When to use FOR loop instead of while loop? | For loop with different parameters and conditions. | Writing the same program using FOR and while loop to see the difference and understanding the uses of them. | “Think Java” Chapter 7 | |
| 9.3.IT-PRG.1, 8.2.12.E | How to break out a loop or continue without breaking? | Using keywords “break” and “continue” | Showing students a program with bugs that need to be fixed by adding break and continue. | “Think Java” Chapter 7 | |

Robbinsville Public Schools
Unit #8: Arrays

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| Enduring Understandings: <ul style="list-style-type: none"> ● Creating Arrays ● Accessing Arrays ● Printing Arrays ● Array Traversal ● Vocab Words | Essential Questions: <ul style="list-style-type: none"> ● How are arrays declared/ assigned / used in a Java program? ● How to traverse through the elements of an array? |
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Interdisciplinary Connection

N -VM - Vector and Matrix Quantities.

Example: Students will be using the knowledge of matrix in creating lists and tuples. Students will be extending their knowledge in using lists with String and other types of variables.

| Guiding / Topical Questions with Specific Standards | | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |
|---|---|---|---|---------------------------------------|---|
| 9.3.IT-PRG.1, 8.2.12.E | How can the multiple elements of the same data types be used in Java? | Creating / accessing / printing from arrays | Demonstrating Arrays using pill organizer. Modeling in writing program using arrays | “Think Java” Chapter 8 | Written Tests and Quizzes Programming assessment for the topic Debug a program to find errors |
| 9.3.IT-PRG.1, 8.2.12.E | What is the efficient way to access every single value in an array? | Using FOR loop in accessing arrays | Iterating through FOR loop in understanding how the program will work in accessing values of array. | “Think Java” Chapter 8 | |

Robbinsville Public Schools Unit #9: Strings

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| Enduring Understandings: <ul style="list-style-type: none"> ● Primitive Data Type: character ● Immutable | Essential Questions: <ul style="list-style-type: none"> ● Why is the “String” data type written with the upper case “S”? ● Why Strings are immutable? |
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| <ul style="list-style-type: none"> ● String Traversal ● String Methods ● Wrapper Class ● Vocab Words | <ul style="list-style-type: none"> ● What String Methods are available in Java? ● What are Wrapper classes? |
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Interdisciplinary Connection

HPE: 2.5.12.C.1. Analyze the role, responsibilities, and preparation of players, officials, trainers, and other participants and recommend strategies to improve their performance and behavior.

Example: Students will be working in groups to achieve certain goals set by the teacher. They would have to take turns in working show good sportsmanship when another team finishes before them and work really well as a team together.

| Guiding / Topical Questions with Specific Standards | | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |
|---|--|---|--|---------------------------------------|--|
| 9.3.IT-PRG.1, 8.2.12.E | When to use Character “char” and String? | “char” - primitive data type | Demonstrating in writing a program that uses “char” | “Think Java” Chapter 9 | <p>Written Tests and Quizzes</p> <p>Programming assessment for the topic</p> <p>Debug a program to find errors</p> |
| 9.3.IT-PRG.1, 8.2.12.E | Can we replace particular character of the given String? What is Immutability? | Understanding some restrictions in using the String variable. (Immutability) | Fixing a program with errors showing String’s Immutability in the program. | “Think Java” Chapter 9 | |
| 9.3.IT-PRG.1, 8.2.12.E | How can we navigate through a String? How will FOR loop be used in doing that? | Replacing a single character in a String with another character. Removing a particular character or word in a sentence. | Writing pseudo code to walk through a String using For loop. Students will iterate through the program to figure out how the loop helps in doing that. | “Think Java” Chapter 9 | |

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| 9.3.IT-PRG.1, 8.2.12.E | What are String Methods? How do they benefit the user in writing a program? | substring, indexOf, equals, etc | Figuring out the practical uses of String and finding out if there is a Method that exists to be used with a String | “Think Java” Chapter 10 | <p>Written Tests and Quizzes</p> <p>Programming assessment for the topic</p> <p>Debug a program to find errors</p> |
| 9.3.IT-PRG.1, 8.2.12.E | Like “String” method, what methods are available for the primitive data types? | Wrapper Class: Integer, Double, Boolean | Brainstorming different needs in the primitive data types and figure out which ones are available by writing a program | | |

Robbinsville Public Schools
Unit #10: Introduction to Object Oriented Programming (OOP)

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| Enduring Understandings: <ul style="list-style-type: none"> Classes <ul style="list-style-type: none"> Constructors Getters / Setters Writing Methods Overloading Methods Create Objects using class <ul style="list-style-type: none"> Variable Visibility Using Methods from class Differences between Overloading / Overriding | Essential Questions: <ul style="list-style-type: none"> How Java is classified as the OOP language? How methods and variables are accessed from outside the class? What are the differences between overriding/ overloading? |
| <p style="text-align: center;">Interdisciplinary Connection</p> <p>RH.9-10.7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text, to analyze information presented via different mediums.</p> <p style="text-align: center;">Example: Students will be creating a T-chart with the facts they find out about the similarities and differences between two topics.</p> | |

| Guiding / Topical Questions with Specific Standards | | Content, Themes, Concepts, and Skills | Teaching Strategies | Instructional Resources and Materials | Assessment Strategies |
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| 9.3.IT-PRG.1, 8.2.12.E | What are classes in Java? | Writing a Class with: <ul style="list-style-type: none"> Constructors Getters / Setters Writing Methods Overloading Methods | With group of students, roleplay assigning variables and methods. Using that model write a class as a group | “Think Java” Chapter 11 | Written Tests and Quizzes Programming assessment for the topic Debug a program to find errors |
| 9.3.IT-PRG.1, 8.2.12.E | How are classes used in the main program? | Creating Objects using class <ul style="list-style-type: none"> Variable Visibility Using Methods from class | Demonstrating with flashcards to see the hierarchy of classes. Creating objects that visibility according to the privacy setting of the methods and variables. | “Think Java” Chapter 10 | |

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| 9.3.IT- PRG.1, 8.2.12.E | How to understand if a method is overriding / overloading? | Differences between Overloading / Overriding | Drawing a T-chart that explains the similarities and differences | “Think Java” Chapter 11 | Written Tests and Quizzes Programming assessment for the topic Debug a program to find errors |
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General Differentiated Instruction Strategies

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| <ul style="list-style-type: none"> • Leveled texts • Chunking texts • Choice board • Socratic Seminar • Tiered Instruction • Small group instruction • Guided Reading • Sentence starters/frames • Writing scaffolds • Tangible items/pictures • Adjust length of assignment | <ul style="list-style-type: none"> • Repeat, reword directions • Brain breaks and movement breaks • Brief and concrete directions • Checklists for tasks • Graphic organizers • Assistive technology (spell check, voice to type) • Study guides • Tiered learning stations • Tiered questioning • Data-driven student partnerships • Extra time |
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Possible Additional Strategies for Special Education Students, 504 Students, At-Risk Students, and English Language Learners (ELLs)

| Time/General | Processing | Comprehension | Recall |
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| <ul style="list-style-type: none"> • Extra time for assigned tasks • Adjust length of assignment • Timeline with due dates for reports and projects • Communication system between home and school • Provide lecture notes/outline | <ul style="list-style-type: none"> • Extra Response time • Have students verbalize steps • Repeat, clarify or reword directions • Mini-breaks between tasks • Provide a warning for transitions • Reading partners | <ul style="list-style-type: none"> • Precise step-by-step directions • Short manageable tasks • Brief and concrete directions • Provide immediate feedback • Small group instruction • Emphasize multi-sensory learning | <ul style="list-style-type: none"> • Teacher-made checklist • Use visual graphic organizers • Reference resources to promote independence • Visual and verbal reminders • Graphic organizers |

| Assistive Technology | Assessments and Grading | Behavior/Attention | Organization |
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| <ul style="list-style-type: none"> ● Computer/whiteboard ● Tape recorder ● Spell-checker ● Audio-taped books | <ul style="list-style-type: none"> ● Extended time ● Study guides ● Shortened tests ● Read directions aloud | <ul style="list-style-type: none"> ● Consistent daily structured routine ● Simple and clear classroom rules ● Frequent feedback | <ul style="list-style-type: none"> ● Individual daily planner ● Display a written agenda ● Note-taking assistance ● Color code materials |

Enrichment

The goal of Enrichment is to provide learners with the opportunity to participate in extension activities that are differentiated and enhance the curriculum. All enrichment decisions will be based upon individual student needs.

- Show a high degree of intellectual, creative and/or artistic ability and demonstrate this ability in multiple ways.
- Pose questions and exhibit sincere curiosity about principles and how things work.
- The ability to grasp concepts and make real world and cross-curricular connections.
- Generate theories and hypotheses and pursue methods of inquiry.
- Produce products that express insight, creativity, and excellence.
- Possess exceptional leadership skills.
- Evaluate vocabulary
- Elevate Text Complexity
- Inquiry based assignments and projects
- Independent student options
- Tiered/Multi-level activities
- Purposeful Learning Center
- Open-ended activities and projects
- Form and build on learning communities
- Providing pupils with experiences outside the 'regular' curriculum
- Altering the pace the student uses to cover regular curriculum in order to explore topics of interest in greater depth/breadth within their own grade level
- A higher quality of work than the norm for the given age group.
- The promotion of a higher level of thinking and making connections.
- The inclusion of additional subject areas and/or activities (cross-curricular).

- Using supplementary materials in addition to the normal range of resources.

English Language Learner (ELL) Resources

- Learning style quiz for students- <http://www.educationplanner.org/students/self-assessments/learning-styles-quiz.shtml>
- “Word clouds” from text that you provide-<http://www.wordle.net/>
- Bilingual website for students, parents and educators: <http://www.colorincolorado.org/>
- Learn a language for FREE-www.Duolingo.com
- Time on task for students-<http://www.online-stopwatch.com/>
- Differentiation activities for students based on their Lexile-www.Mobymax.com
- WIDA-<http://www.wida.us/>
- Everything ESL - <http://www.everythingESL.net>
- ELL Tool Box Suggestion Site<http://www.wallwisher.com/wall/elltoolbox>
- Hope4Education - <http://www.hope4education.com>
- Learning the Language <http://blogs.edweek.org/edweek/learning-the-language/>
- FLENJ (Foreign Language Educators of NJ) 'E-Verse' wiki: <http://www.flenj.org/Publications/?page=135>
- OELA - <http://www.ed.gov/offices/OBEMLA>
- New Jersey Department of Education- Bilingual Education information <http://www.state.nj.us/education/bilingual/>

Special Education Resources

- Animoto -Animoto provides tools for making videos by using animation to pull together a series of images and combining with audio. Animoto videos or presentations are easy to publish and share. <https://animoto.com>

- Bookbuilder -Use this site to create, share, publish, and read digital books that engage and support diverse learners according to their individual needs, interests, and skills. <http://bookbuilder.cast.org/>
- CAST -CAST is a non-profit research and development organization dedicated to Universal Design for Learning (UDL). UDL research demonstrates that the challenge of diversity can and must be met by making curriculum flexible and responsive to learner differences. <http://www.cast.org>
- CoSketch -CoSketch is a multi-user online whiteboard designed to give you the ability to quickly visualize and share your ideas as images. <http://www.cosketch.com/>
- Crayon -The Crayon.net site offers an electronic template for students to create their own newspapers. The site allows you to bring multiple sources together, thus creating an individualized and customized newspaper. <http://crayon.net/> Education Oasis -Education Oasis offers a collection of graphic organizers to help students organize and retain knowledge – cause and effect, character and story, compare and contrast, and more! <http://www.educationoasis.com/printables/graphic-organizers/>
- Edutopia -A comprehensive website and online community that increases knowledge, sharing, and adoption of what works in K-12 education. We emphasize core strategies: project-based learning, comprehensive assessment, integrated studies, social and emotional learning, educational leadership and teacher development, and technology integration. <http://www.edutopia.org/>
- Glogster -Glogster allows you to create "interactive posters" to communicate ideas. Students can embedded media links, sound, and video, and then share their posters with friends. <http://edu.glogster.com/?ref=personal>
- Interactives – Elements of a Story -This interactive breaks down the important elements of a story. Students go through the series of steps for constructing a story including: Setting, Characters, Sequence, Exposition, Conflict, Climax, and Resolution. <http://www.learner.org/interactives/story/index.html>
- National Writing Project (NWP) -Unique in breadth and scale, the NWP is a network of sites anchored at colleges and universities and serving teachers across disciplines and at all levels, early childhood through university. We provide professional development, develop resources, generate research, and act on knowledge to improve the teaching of writing and learning in schools and communities. <http://www.nwp.org>
- Pacecar -Vocab Ahead offers videos that give an active demonstration of vocabulary with audio repeating the pronunciation, definition, various uses, and synonyms. Students can also go through flash cards which give a written definition and visual representation of the word. <http://pacecar.missingmethod.com/>