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Marking Period	Unit Title	Recommended Instructional Days
Marking Period 3	**Unit 7:** ● Task 1: Students will create a graphics program that has three user-defined functions that will be designated to displaying a face, a smiling face, and a sad face. Students will draw structure charts for the functions. They will write module specifications for the functions. They will also code the functions in a faces library(faces.h/faces.cpp). Students will then create a driver program to display the faces. ● Task 2: Students will begin the foundation for a dice game. They will create a graphics library that defines six functions (named displayOne, displayTwo, etc.) that draw images of the six faces of a die.Each function should expect four parameters: the coordinates of the upper-left corner and the height and width of the die. The fill color of a dot is black and the fill color of the rest of the die is white. The students will then write a driver program that includes the dice library and tests the functions. ● Task 3: Students will create a program to display an optical illusion caused by the phenomenon known as induced contrast. Induced contrast occurs when two images of the same shade are placed on backgrounds of different shades, as shown below: One image appears darker than the other, even though they are exactly the same shade. **Unit 8:** ● Task 1: Students will use a SADS to write a program that calculates the total cost of a given long distance phone call.	MP3 - 45 days, Units 7-9
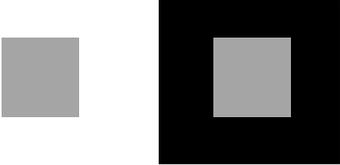
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- Task 2: Students will use a SADS to write a program that will determine the larger of two given integer values and then display both the quotient and remainder.
- Task 3: Students will use a DADS to write a program that will determine the larger of two given integer values and then display both the quotient and remainder. If there is no remainder, print only the quotient and the letter 'r'.
- Task 4: Students will write a program to revise Task 3 so that it displays an error message if the smaller given number is 0.
- Task 5: Given two points on a graph, students will create a program to display the slope of a line passing through them.
- Task 6: Using multi-branch decision statements, students will create a program for Dr. Lae Z. Programmer to computerize his grading system based on 5 tests and then averaging only the four highest scores. Scores will be displayed according to a letter grade system.
- Task 7: Using multi-branch decision statements, students will create a program to determine whether the given sides of a triangle make it scalene, isosceles, or equilateral.
- Task 8: Using multi-branch decision statements, students will write a program to determine the amount of income tax citizens of the island nation Babbage owe according to income and tax rate schedule.
- Task 9: Using multi-branch decision statements, students will write a program to determine the cost of a vehicle's registration based on the user's car weight.
- Task 10: Using a DADS statement, students will write a program to determine whether or not an object will float based on its mass and volume.
- Task 11: Using multi-branch decision statements, students will write a program for a physics teacher which will allow a user to make English-to-metric conversions. Units of measurement will include pounds, feet, and miles.
- Task 12: Using multi-branch decision statements, students will write a program to convert a given temperature into either Celsius or Fahrenheit.

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- Task 13: Using multi-branch decision statements, students will write a program for the city of Mt. Pleasant to calculate and display the amount its residents owe for sewage, water, and sanitation.
- Task 14: Using multi-branch decision statements and nested selection statements, students will write a program for Lucky Wildcat Well Corporation to determine whether or not a well is making money based on money spent to drill, the type of well found, the amount of oil or gas found, the purity of the well, and unit prices.
- Task 15: Using multi-branch decision statements, students will write a program to calculate and display the amount of money delegates will be reimbursed for attending the annual summer meeting of the Mathematical Association of America.
- Task 16: Using multi-branch decision statements, students will write a program to add, subtract fractions.
- Task 17: Using a switch statement, students will create an interactive program to determine how much a person would weigh on another planet based on its force of gravity.

Unit 9:
- Task 1: Students will modify the dice program so that it plays an interactive game with the user. The program should display the computer's roll of dice at startup. When the user presses the mouse, the program should display the user's roll of the dice. When the second roll is displayed, the program should display a message about the winner ("You Win" or "I Win" or "We Tie). Each mouse click after that should alternate between the computer's roll and the user's roll.
- Task 2: Students will modify the circle-drawing program so that the user can specify the radius of the circle with the mouse. To do this, the user presses the mouse at the circle's center point and holds the button down while moving the mouse to the circumference. When the user releases the mouse, the program draws the circle with the indicated center point and radius.

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Life Literacy & Key Skills Disciplinary Concept: *Core Idea*	Performance Expectation/s:	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit
Creativity and Innovation Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed. **Digital Citizenship** Network connectivity and computing capability extended to objects, sensors and everyday items not normally considered computers allows these devices to generate, exchange, and consume data with minimal human intervention. **Technology Literacy** Digital tools differ in features, capacities, and styles. Knowledge of different digital tools is helpful in selecting the best tool for a given task. Collaborative digital tools can be used to access, record and share different viewpoints and to collect and tabulate the views of groups of people.	**TECH.9.4.12.CT.1:** Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3). **TECH.9.4.12.CT.2:** Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a) **TECH.9.4.12.DC.8:** Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection. 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.2: Generate data using formula-based calculations in a spreadsheet and draw conclusions about the data. 9.4.12.TL.3: Analyze the effectiveness of the process and quality of collaborative environments.	**Essential Question/s:** ● How is a graphics function defined? ● How do you fill shapes in graphics programs? ● Why are selection statements important? ● How are selection statements used to allow a computer to "make decisions"? ● How can selection statements be used to enhance graphics programs? **Activity Description:** ● Create user-defined graphics functions within C++ programs to display 2D images ● Create programs that utilize single alternative decision structures ● Create programs that utilize double alternative decision structures ● Create programs that utilize multi-branch decision structures ● Create programs that utilize switch statements.create programs that utilize multiple selection statements and nested selection statements. ● Create graphics programs that "make decisions" by utilizing random number generation and selection statements.
Career Awareness, Exploration, Preparation, & Training Disciplinary Concept: *Core Idea*	**Performance Expectation/s:**	
Career Awareness and Planning There are strategies to improve one's professional value and marketability.	**WRK.9.2.12.CAP.3:** Investigate how continuing education contributes to one's career and personal growth.	

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Career Awareness and Planning Career planning requires purposeful planning, based on research, self-knowledge, and informed choices.	**WRK.9.2.12.CAP.6:** Identify transferable skills in career choices and design alternative career plans based on those skills.	
Social and Emotional Learning: *Competencies*	**Social and Emotional Learning:** *Sub-Competencies*	
-Self- awareness -Social Awareness -Self- Management -Relationship Skills -Responsibility -Decision-Making	● Recognizing the importance of self-confidence in handling daily tasks and challenges. ● Demonstrate an awareness of the expectations for social interactions in a variety of ways. ● Demonstrate an understanding of the need for mutual respect when viewpoints differ. ● Recognize the skills needed to establish and achieve personal and educational goals. ● Utilize positive communication and social skills to interact effectively with others. ● Develop, implement, and model effective problem solving and critical thinking skills.	
Assessments (Formative) *To show evidence of meeting the standard/s, students will successfully engage within:*		**Assessments (Summative)** *To show evidence of meeting the standard/s, students will successfully complete:*

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- Tests - Quizzes - Practice problems for homework - Worksheets - Lab work: Write programs - Observation - Oral Explanation Check	**Benchmarks:** - Students will obtain a score of 70% or higher, students who complete the proper assigned classwork will be assigned - Rubric evaluations **Summative Assessments:** - District Assessments - Evidence that students can perform the functions - Final documents/projects

Differentiated Student Access to Content: **Teaching and Learning *Resources/Materials***			
Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
	- Meet with the student's special education or inclusion teacher prior to initial assessment to learn how to best tailor the format of any classwork, quiz or test to their individual special needs, as well as to discuss whether or not homework is appropriate. - Provide access to an individual or classroom aide, when required by the student's IEP or 504, to improve student focus, comprehension and time on task. - Provide access to modified materials as needed to improve accessibility (slant boards, headphones for auditory processing disorders, gym mats for	- Allow access to supplemental materials, including use of online bilingual dictionaries. - Meet with an ELL trained or inclusion teacher prior to initial assessment to learn how to best tailor the format of any classwork, quiz or test to their individual needs.	Connect students to related talent development opportunities, often offered through area colleges, with the assistance of guidance counselors.

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	additional cushioning, active/sensory seating pads, helmets and body padding as required by physical therapist, etc.). Many can be borrowed from a student's special education classroom, or the school's Occupational or Physical Therapists.		

Supplemental Resources

Technology:
- Assistive technology may be required for students with IEPs and 504s. Access to computers with screen readers, voice recognition software, and talking word processing applications may be beneficial. Some students with limited verbal abilities may require access to assistive communication devices and tablets that can be accessed through the school's speech therapist.

Other:
- Microsoft Visual C++ Software
- Fundamentals of C++ Second Edition
- Course Technology
- Thomson Learning
- Lambert / Nance

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	Alternate Core Resources *IEP/504/At-Risk/ESL*	ELL Core Resources	Gifted & Talented Core
• Offer resources to students in a variety of ways to accommodate for multiple learning styles. • Engage all learners through implementation of various resources including visual, audio, and tactile materials.	• Utilize a multi-sensory (Visual, Auditory, Kinesthetic, Tactile) approach as needed during instruction to better engage all learners. • Provide alternate presentations of skills and steps required for project	• Provide extended time to complete classwork and assessments as needed. Assignments and rubrics may need to be modified. • Provide access to preferred seating, when requested.	• Offer pre-assessments to better understand students' strengths, and create an enhanced set of introductory activities accordingly. • Integrate active teaching and learning opportunities, including grouping gifted

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● Provide easy access to course resources so the student can utilize materials within the classroom or at home to reiterate content learned within the course.	completion by varying the method (repetition, simple explanations, visual step-by-step guides, additional examples, modeling, etc). ● Allow additional time to complete classwork as needed, when required according to students' IEP or 504 plan. Break assignments up into shorter tasks while repeating directions as needed. Offer additional individual instruction time as needed. ● Modify test content and/or format, allowing students additional time and preferential seating as needed, according to their IEP or 504 plan. Review, restate and repeat directions during any formal or informal assessments.	● Check often for understanding, and review as needed, providing oral and visual prompts when necessary.	students together to push each other academically. ● Propose interest-based extension activities and opportunities for extra credit.

New Jersey Legislative Statutes and Administrative Code						
(place an "X" before each law/statute if/when present within the curriculum map)						

	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*		LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*		Standards in Action: *Climate Change*

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Standard 9

9 Career Ready Practices	__X__CRP1. Act as a responsible and contributing citizen and employee. __X__CRP2. Attend to financial well-being. __X__CRP3. Consider the environmental, social and economic impacts of decisions. __X__CRP4. Demonstrate creativity and innovation. __X__CRP5. Utilize critical thinking to make sense of problems and persevere in solving them. __X__CRP6. Model integrity, ethical leadership and effective management. __X__CRP7. Plan education and career paths aligned to personal goals. __X__CRP8. Use technology to enhance productivity, increase collaboration and communicate effectively. __X__CRP9. Work productively in teams while using cultural global competence.