Pascack Valley Regional High School District

Pascack Hills High School, Montvale, New Jersey Pascack Valley High School, Hillsdale, New Jersey

Course Name: AP Computer Science A

Born On: August, 2020

Previous Revision: August, 2022

Current Revision: August, 2023

Board Approval: 8/28/23

Course Description:

The purpose of this class is to introduce the student to the object-oriented programming paradigm using the Java language. This course emphasizes object-oriented methodology with a concentration on problem-solving and algorithm development. This course will follow the outline recommended by the AP® Computer Science Curriculum, Exam A. Concepts such as classes, objects, inheritance, polymorphism, and code reusability are studied. It also includes algorithms, data structures, and data abstraction. Hands-on laboratory work helps solidify each concept. In addition, students complete a long-term programming project that they must demonstrate in a formal presentation.

All computer science courses in the Pascack Valley Regional High School District are designed to address multiple learning styles and needs, and accommodations and modifications are made for students with disabilities, multilingual students, students at risk of failure, gifted and talented students, and students with 504 plans. AP Computer Science A builds on concepts learned and skills developed in Honors Computer Science, while also spiraling in those concepts and skills to reinforce and strengthen students' knowledge of computer science. Additionally, AP Computer Science A anticipates higher-level computer science concepts and skills that will be learned in Advanced Topics in Computer Science and college-level computer science courses, and enrichment opportunities are provided to challenge students and engage them in rich, interesting tasks. Students are encouraged to analyze data using tools and models to make valid and reliable claims (9.4.12.IML.3), and various technologies and applications are technology are integrated throughout the curriculum.

The Pascack Valley Regional High School Computer Science Department integrates 21st century life and career skills across its courses, with the dual goal of informing students about careers and fields of study that use computer science (9.3.ST.5, 9.3.ST-ET.5 and 9.3.ST-SM.2), and helping students improve the computational thinking skills they will need to in those careers and fields of study (9.2.12.CAP.2). Computer Science courses address the New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills, with a particular emphasis on demonstrating the ability to reflect, analyze and use creative skills and ideas (9.4.12.CI.1), investigating new challenges and opportunities for personal growth, advancement and transition (9.4.12.CI.3), identifying problem-solving strategies used in the development of an innovative product or practice (9.4.12.CT.1), and explaining the potential benefits of collaborating to enhance critical thinking and problem solving (9.4.12.CT.2). Computer Science courses also address the New Jersey Student Learning Standards for English Language Arts Companion Standards, with a particular focus on following complex multistep procedures (RST.9-10.3/RST.11-12.3), determining the meaning of symbols, key terms, and other domain-specific words and phrases (RST.9-10.4/RST.11-12.3), and translating quantitative or technical information expressed in words into visual forms and translating information expressed visually or mathematically into words (RST.9-10.7). Similarly, the Computer Science Department seeks to support students by providing them with opportunities to use computational thinking skills in interdisciplinary contexts, in contexts that are meaningful to students, and in contexts that attend to the contributions and perspectives of historically marginalized groups. Specifically, computer science courses will look to incorporate, when appropriate, contributions and experiences of people from the LGBTQ+ community and individuals with disabilities, and references to issues of social and cultural relevance, including climate change.

Course Outline [C2]

References to the following are abbreviated as follows:

(SG) -Study Guide (TB)- Text Book (P)-Programs

Curricular Requirements

[C2]- The course includes all of the topics listed in the "Computer Science A" column of the Topic Outline in the AP Computer Science Course Description.

Grade Level: 10 - 12

- [C3]- The course teaches students to design and implement computer-based solutions to problems in a variety of application areas.
- [C4]—The course teaches students to use and implement commonly used algorithms and data structures.
- [C5]—The course teaches students to develop and select appropriate algorithms and data structures to solve problems.
- [C6]- The course teaches students to code fluently in an object-oriented paradigm using the programming language Java. The course teaches students to use standard Java library classes from the AP Java subset delineated in Appendices A and B of the AP Computer Science Course Description. (Note: Students who study a language other than Java in AP Computer Science must also be taught to use Java, as specified in the AP Java subset.)
- [C7]—The course teaches students to read and understand a large program consisting of several classes and interacting objects, and enables students to read and understand the current *AP Computer Science Case Study* posted on AP Central®.
- [C8]—The course teaches students to identify the major hardware and software components of a computer system, their relationship to one another, and the roles of these components within the system.
- [C9]—The course teaches students to recognize the ethical and social implications of computer use.

AP Computer Science A: This course explores the object-oriented programming paradigm using the Java language, with a concentration on problem-solving and algorithm development. This course will follow the outline recommended by the AP® Computer Science Curriculum, Exam A. Concepts such as classes, objects, inheritance, polymorphism, and code reusability are studied. It also includes algorithms, data structures, and data abstraction.

Chapter in Key Learning Items/Concepts NJSLS CS & Design Formative, Core Instructional and Supplementary Concepts Supplementary Concepts

Chapter in Horstmann Textbook/ Pacing Guide (Weeks)	morphism, and code reusability are studied. It also include Key Learning Items/Concepts	NJSLS CS & Design Thinking Standards	Formative, Summative, Benchmark, and Alternative Assessments	Core Instructional and Supplemental Materials/ Modifications and Accommodations
Unit 1 1 (1) Introduction 2 (2-3) Using Objects 3 (4-5) Implementing Classes 4 (6-7) Fundamental Data Types 5 (8-9) Decisions	 Week 1: Introduction to Computer Science and the Java Programming Language. Understand the activity of programming. The anatomy of a computer. Learn about the architecture of Computers, including hardware and software components Hardware/Software Learn about machine code and high-level programming languages Become familiar with Eclipse and the Computing environment Errors The Compilation Process: Compile and run programs Recognize syntax and logic errors Understand the file system and have a Backup Strategy Weeks 2-3: Learn about the types and variables The assignment operator Classes. Understand the concepts of classes and objects. Be able to call methods. Learn about parameters and return values. Accessor and mutator methods API documentation Object References Weeks 4-5: Black boxes Public interfaces Instance fields 	NJSLS Content Standards 8.1.12.CS.1 8.1.12.CS.2 8.1.12.CS.3 8.1.12.CS.4 8.1.12.IC.1 8.1.12.DA.1 8.1.12.DA.2 8.1.12.DA.3 8.1.12.DA.4 8.1.12.AP.1 8.1.12.AP.2 8.1.12.AP.4 NJSLS SMP MP1. Make sense of problems and persevere in solving them MP2. Construct viable arguments and critique the reasoning of others MP3. Reason abstractly and quantitatively MP4. Model with mathematics MP5. Attend to precision MP6. Use appropriate tools strategically MP7. Look for and make use of structure MP8. Look for and express regularity in repeated reasoning	Suggestion(s): Students will be assessed regularly throughout this course, with a focus on both conceptual understanding and procedural fluency. Assessment tools may include the following: - quizzes (F) - tests (S) - performance tasks (F/S) - projects (S) - homework (F) - discussions (F) - journals (F) - Form A, B, or C benchmark (B) - alternative assessments (A) - portfolio (F, S) - online learning courses (F) - Group Learning Projects (S) - Oral Presentations (S)	Selection of primary sources Suggestion(s): College Board. AP GridWorld Case Study. New York: College Entrance Examination Board, 2006. (on grade level); Horstmann, Cay. Java Concepts. 4th ed. Hoboken, N.J.: Wiley, 2006. (on grade level; remediation); Trees, Frances P. AP Computer Science Study Guide to Accompany Java Concepts. 4th ed. Hoboken, N.J.: Wiley, 2006. (on grade level; remediation; advanced) Programs: P2.1-2.2 P2.9 P3.6, P3.7, P3.12 (Write small classes from scratch, choosing appropriate data representation.) Assign small programs that illustrate different types of input and output. Also P4.4-4.6 (DataSet) P4.12 (Digit Extractor) P6.4, P6.10,P6.14 Modifications and Accommodations: Students with special needs: Teachers and support staff will attend to all modifications and accommodations listed in students' IEPs and 504s. Teachers will incorporate

Course: AP Computer Science A PVRHSD CURRICULUM MAP Grade Level: 10 – 12

- Implementing constructors and methods
- Testing a class
- Implicit and explicit method parameters
- Understand the importance of comments

Weeks 6-7:

- Number Types
- Recognize the importance of the numeric types
- Assignment, increment, and decrement
- Constants
- Arithmetic and Mathematical Functions
- Calling Static Methods
- Strings
- Review of Binary Numbers

Weeks 8-9:

- if statement.
- comparing values
- Multiple Alternatives
- Boolean expressions

Content-specific modifications and accommodations

- use multiple representations and technology to support conceptual understanding
- provide students with skeletons of code and/or utilize flexible grouping

Interdisciplinary/additional connections

- Engage in programming assignments that have applications in science, mathematics, or business
- Consider potential programming applications for climate change
- Draw on contexts from diverse groups for programming exercises

- 1. Fostering an inclusive Computing Culture
- 2. Collaborating around Computing
- 3. Recognizing and Defining Computational Problems
- 7. Communicating about Computing

NJSLS for ELA Companion Standards

RST.9-10.3 RST.9-10.4 RST.9-10.7 RST.11-12.3 RST.11-12.4

NJSLS-CLKS - 21st Century Life and

Careers

9.4.12.CI.1 9.4.12.CI.3 9.4.12.CT.1 9.4.12.CT.2

- Technology

9.4.12.IML.3

- Career Education

9.2.12.CAP.2 9.3.ST.5 9.3.ST-ET.5 9.3.ST-SM.2 manipulatives, extra time, alternative assessments, scaffolding, spiraling, technology, and flexible grouping to support student learning.

Multilingual students: Teachers and support staff will work to support multilingual students in their first language and in English, providing materials and/or resources to support students' understanding. Students will be given additional time, as appropriate, and translation tools will be utilized as needed.

Students at risk of school failure:

Formative and summative data will be used to monitor student success, and students at risk of failure will receive additional supports and services, which may include parent consultation, extra help, and differentiation strategies, including small group instruction, group work, scaffolding, and spiraling.

Gifted and Talented Students:

Students who excel in their mastery of course standards will be further challenged with more complex tasks, extensions of concepts and skills, and extended problem solving and critical thinking opportunities.

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· 1 · 1	inheritance, polymorphism, and code reusability are studied. It also includes algorithms, data structures, and data abstraction.				
Chapter in	Key Learning Items/Concepts	NJSLS CS & Design	Formative,	Core Instructional and Supplemental Materials/	
Horstmann		Thinking Standards	Summative,	Modifications and Accommodations	
Textbook/			Benchmark, and		
Pacing Guide			Alternative		
(Weeks)			Assessments		
Unit 2	Weeks 10-12:	NJSLS Content	Suggestion(s):	Selection of primary sources	
6 (10-12)	 while loops 	Standards	Students will be	Suggestion(s):	
Iteration	 for loops 		assessed regularly	College Board. AP GridWorld Case Study.	
7 (13)	 Nested loops 	8.1.12.AP.1	throughout this	New York: College Entrance Examination	
Case Study Part 1-	Avoid infinite loops and	8.1.12.AP.2	course, with a	Board, 2006. (on grade level); Horstmann,	
Consumer Review	off-by- one errors	8.1.12.AP.3	focus on both	Cay. Java Concepts. 4th ed. Hoboken, N.J.:	
8 (14-16) Arrays and	Processing sentinel values	8.1.12.AP.4 8.1.12.AP.5	conceptual understanding and	· ·	
ArrayLists	Random Numbers and	8.1.12.AP.6	procedural	Wiley, 2006. (on grade level; remediation);	
9 (17-19)	Simulation	8.1.12.AP.7	fluency.	Trees, Frances P. AP Computer Science	
Designing	Week 13:	8.1.12.AP.8	Assessment tools	Study Guide to Accompany Java Concepts.	
Classes	Experimenting with a large	8.1.12.CS.4	may include the	4th ed. Hoboken, N.J.: Wiley, 2006. (on	
	program	8.1.12.DA.2	following:	grade level; remediation; advanced)	
	• Using classes	8.1.12.DA.6	- quizzes (F)		
	Observe the attributes and		- tests (S)	Programs: Roulette Program in SG, FunNumber	
	the behavior of the actors	NJSLS SMP	- performance	Program, P7.15 Project 7.2 (NIM)	
	Weeks 14-16:		tasks (F/S)	P8.2-8.4,P8.10, Project 8.1 (Poker)	
	Arrays and ArrayLists	MP1. Make sense of	- projects (S)	(P) Concentration	
	Wrappers and Auto-Boxing	problems and persevere in	- homework (F)	Create classes from scratch,	
	The generalized for loop	solving them MP2. Construct viable	- discussions (F) - journals (F)	Choosing appropriate data structures	
	Study common Array	arguments and critique	- Form A, B, or C	Project 9.2 (Bar	
	Algorithms	the reasoning of others	benchmark (B)	Codes/Zip Codes)	
	Copying arrays	MP3. Reason abstractly	- alternative	Modifications and Accommodations:	
	Copying arrays Understand when to choose	and quantitatively	assessments	Students with special needs: Teachers and support	
	• Understand when to choose the appropriate data	MP4. Model with	(A)	staff will attend to all modifications and	
	structure in your programs.	mathematics	- portfolio (F, S)	accommodations listed in students' IEPs and 504s.	
	Arrays vs. array lists.	MP5. Attend to precision	- online learning	Teachers will incorporate manipulatives, extra time,	
	Weeks 17-19:	MP6. Use appropriate	courses (F)	alternative assessments, scaffolding, spiraling,	
	Choosing appropriate	tools strategically	- Group Learning	technology, and flexible grouping to support student	
	classes	MP7. Look for and make	Projects (F)	learning.	
	Cohesion and coupling	use of structure	- Individual	Multilingual students: Teachers and support staff	
	Accessors, mutators, and	MP8. Look for and	Projects (S) - Oral	will work to support multilingual students in their	
	immutable classes	express regularity in		first language and in English, providing materials	
	Side effects	repeated reasoning	Presentations (S)	and/or resources to support students' understanding.	
	Side effects	<u> </u>		Students will be given additional time, as	

Preconditions Static methods Static fields Scope packages Content-specific modifications and accommodations use multiple representations and technology to support conceptual understanding provide students with skeletons of code and/or utilize flexible grouping Interdisciplinary/additional connections Engage in programming assignments that have applications in science, mathematics, or business Consider potential programming	1. Fostering an inclusive Computing Culture 2. Collaborating around Computing 3. Recognizing and Defining Computational Problems 7. Communicating about Computing NJSLS for ELA Companion Standards RST.9-10.3 RST.9-10.4 RST.9-10.7 RST.11-12.3 RST.11-12.4 NJSLS-CLKS	appropriate, and translation tools will be utilized as needed. Students at risk of school failure: Formative and summative data will be used to monitor student success, and students at risk of failure will receive additional supports and services, which may include parent consultation, extra help, and differentiation strategies, including small group instruction, group work, scaffolding, and spiraling. Gifted and Talented Students: Students who excel in their mastery of course standards will be further challenged with more complex tasks, extensions of concepts and skills, and extended problem solving and critical thinking opportunities.
code and/or utilize flexible grouping	RST.9-10.3	
connections - Engage in programming assignments that have applications in science, mathematics, or business	RST.9-10.4 RST.9-10.7 RST.11-12.3 RST.11-12.4 NJSLS-CLKS - 21 st Century Life and Careers 9.4.12.CI.1 9.4.12.CI.3 9.4.12.CT.1 9.4.12.CT.1	and critical animals opportunities.
	- Technology 9.4.12.IML.3	
	- Career Education 9.2.12.CAP.2 9.3.ST.5 9.3.ST-ET.5 9.3.ST-SM.2	

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Chapter in	Key Learning Items/Concepts	NJSLS CS & Design	Formative,	Core Instructional and Supplemental Materials/
Horstmann		Thinking Standards	Summative,	Modifications and Accommodations
Textbook/			Benchmark, and	
Pacing Guide			Alternative	
(Weeks)			Assessments	
Unit 3	Week 20:	NJSLS Content	Suggestion(s):	Selection of primary sources
10 (20)	 Carry out unit tests 	Standards	Students will be	Suggestion(s):
Testing and	• Understand the principles of		assessed regularly	College Board. AP GridWorld Case Study.
Debugging	test case selection and	8.1.12.AP.1	throughout this	New York: College Entrance Examination
11 (21-22)	evaluation	8.1.12.AP.2	course, with a	Board, 2006. (on grade level); Horstmann,
Interfaces and	 Learn strategies for effective 	8.1.12.AP.3	focus on both	, ,
Polymorphism	debugging	8.1.12.AP.4	conceptual	Cay. Java Concepts. 4th ed. Hoboken, N.J.:
12 (23-24)	Testing and Debugging	8.1.12.AP.5	understanding and	Wiley, 2006. (on grade level; remediation);
Case Study Part 2-3 Celebrity Lab	Weeks 21-22:	8.1.12.AP.6 8.1.12.AP.7	procedural fluency.	Trees, Frances P. AP Computer Science
Steganography	Using interfaces for code	8.1.12.AP.8	Assessment tools	Study Guide to Accompany Java Concepts.
13 (25-26)	reuse	8.1.12.AP.9	may include the	4th ed. Hoboken, N.J.: Wiley, 2006. (on
Inheritance	 Converting between class 	8.1.12.CS.4	following:	grade level; remediation; advanced)
14 (27)	and interface types	8.1.12.DA.2	- quizzes (F)	
Case	 Understand the concept of 	8.1.12.DA.5	- tests (S)	Programs:
Study Part 4	Polymorphism		- performance	P11.2 –P11.5(Die Class w/ Measurable Interface)
15 (28)	 Appreciate how interfaces 	NJSLS SMP	tasks (F/S)	Group
Exception	can be used to decouple		- projects (S)	Project11.2:
Handling	classes.	MP1. Make sense of	- homework (F)	Design a general program for
17 (29)	Abstract classes	problems and persevere in	- discussions (F)	managing board games with 2
Object-Oriented	Weeks 23-24:	solving them	- journals (F)	players. Write algorithm and
Design	 Experimenting with a large 	MP2. Construct viable	- Form A, B, or C	choose appropriate data structures.
	program	arguments and critique	benchmark (B)	P13.3,P13.4
	Weeks 25-27:	the reasoning of others	- alternative	Project 17.2
	Inheritance	MP3. Reason abstractly	assessments (A)	(Design and implement Tic-
	Week 28:	and quantitatively MP4. Model with	- portfolio (F, S)	Tac-Toe)
	Understand the exceptions	mathematics	- portiono (F, S)	Modifications and Accommodations:
	that occur when their	MP5. Attend to precision	courses (F)	Students with special needs: Teachers and support
	programs contain errors	MP6. Use appropriate	- Group Learning	staff will attend to all modifications and
	Week 29:	tools strategically	Projects (F)	accommodations listed in students' IEPs and 504s.
	• Encapsulation	MP7. Look for and make	- Individual	Teachers will incorporate manipulatives, extra time,
	Is-a and has-a inheritance	use of structure	Projects (S)	alternative assessments, scaffolding, spiraling,
	relationships	MP8. Look for and	- Oral	technology, and flexible grouping to support student
	-	express regularity in	Presentations (S)	learning.
	• Identify inheritance,	repeated reasoning		
	aggregation, and	1		

Course: AP Computer Science A PVRHSD CURRICULUM MAP Grade Level: 10 – 12

dependency relationships between classes

- Learn about the Software life cycle
- Design and implement a class according to given specifications

Content-specific modifications and accommodations

- use multiple representations and technology to support conceptual understanding
- provide students with skeletons of code and/or utilize flexible grouping

Interdisciplinary/additional connections

- Engage in programming assignments that have applications in science, mathematics, or business
- Consider potential programming applications for climate change
- Draw on contexts from diverse groups for programming exercises

1. Fostering an inclusive Computing Culture

- 2. Collaborating around Computing
- 3. Recognizing and Defining Computational Problems
- 7. Communicating about Computing

NJSLS for ELA Companion Standards

RST.9-10.3 RST.9-10.4 RST.9-10.7 RST.11-12.3 RST.11-12.4

NJSLS-CLKS - 21st Century Life and Careers

9.4.12.CI.1 9.4.12.CI.3 9.4.12.CT.1 9.4.12.CT.2

- Technology 9.4.12.IML.3

- Career Education 9.2.12.CAP.2 9.3.ST.5 9.3.ST-ET.5 9.3.ST-SM.2

Multilingual students: Teachers and support staff will work to support multilingual students in their first language and in English, providing materials and/or resources to support students' understanding. Students will be given additional time, as appropriate, and translation tools will be utilized as needed.

Students at risk of school failure:

Formative and summative data will be used to monitor student success, and students at risk of failure will receive additional supports and services, which may include parent consultation, extra help, and differentiation strategies, including small group instruction, group work, scaffolding, and spiraling. Gifted and Talented Students: Students who excel in their mastery of course standards will be further challenged with more complex tasks, extensions of concepts and skills, and extended problem solving and critical thinking opportunities.

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Chapter in	Key Learning Items/Concepts	NJSLS CS & Design Thinking	Formative,	Core Instructional and Supplemental
Horstmann		Standards	Summative,	Materials/ Modifications and
Textbook/			Benchmark, and	Accommodations
Pacing Guide			Alternative	
(Weeks)			Assessments	
Unit 4	Week 30:	NJSLS Content Standards	Suggestion(s):	Selection of primary sources
18 (30)	 Thinking Recursively 		Students will be	Suggestion(s):
Recursion	 Permutations 	8.1.12.DA.5	assessed regularly	College Board. AP GridWorld Case
19 (31-32)	Tracing Through	8.1.12.DA.6	throughout this course,	Study. New York: College Entrance
Sorting and	Recursive Methods	8.1.12.AP.1	with a focus on both	Examination Board, 2006. (on grade
Searching	Analyze problems that	8.1.12.AP.2	conceptual	, ,
(33-end) Review/	are much easier to	8.1.12.AP.4	understanding and	level); Horstmann, Cay. Java
AP with WE	solve by recursion than	8.1.12.AP.5	procedural fluency.	Concepts. 4th ed. Hoboken, N.J.:
Service-learning	by iteration.	8.1.12.AP.6	Assessment tools may	Wiley, 2006. (on grade level;
	Understand when the	8.1.12.AP.7 8.1.12.AP.9	include the following:	remediation); Trees, Frances P. AP
	use of recursion affects	8.1.12.AP.9 8.2.12.NT.1	- quizzes (F) - tests (S)	Computer Science Study Guide to
	the efficiency of an	8.2.12.EC.2	- performance tasks	Accompany Java Concepts. 4th ed.
	algorithm.	8.2.12.EC.3	(F/S)	Hoboken, N.J.: Wiley, 2006. (on
	Weeks 31-32:	8.1.12.IC.1	- projects (S)	
	Study several sorting	8.1.12.IC.3	- homework (F)	grade level; remediation; advanced)
	and searching		- discussions (F)	_
	algorithms.	NJSLS SMP	- journals (F)	Programs:
	Traversals, Insertions		- Form A, B, or C	P18.1, Towers of Hanoi Activity
	and Deletions	MP1. Make sense of problems and	benchmark (B)	P19.1-19.4, 19.11 Service-learning project
	Selection Sort	persevere in solving them	- alternative	Final Project
	Insertion Sort	MP2. Construct viable arguments	assessments	That Floject
	Merge Sort	and critique the reasoning of others	(A)	Modifications and Accommodations:
	_	MP3. Reason abstractly and	- portfolio (F, S)	Students with special needs: Teachers and
	Sequential Search	quantitatively	- online learning	support staff will attend to all modifications
	Binary Search	MP4. Model with mathematics	courses (F)	and accommodations listed in students'
	Learn how to estimate	MP5. Attend to precision	- Group Learning	IEPs and 504s. Teachers will incorporate
	and compare the	MP6. Use appropriate tools	Projects (F)	manipulatives, extra time, alternative
	efficiency of	strategically	- Individual Projects	assessments, scaffolding, spiraling,
	algorithms.	MP7. Look for and make use of	(S) - Oral Presentations	technology, and flexible grouping to
	Week 33-35:	structure	(S)	support student learning.
	Review AP Computer	MP8. Look for and express	- Final Project (S)	Multilingual students: Teachers and
	Science A topics.	regularity in repeated reasoning	- Presentations (S)	support staff will work to support
	Week 36-End:	1. Fostering an inclusive	- Service-learning	multilingual students in their first language
	 Work on Final Project 	Computing Culture	Project (S)	and in English, providing materials and/or
	Part 1: Investigate and Learn	Companing Culture	110,000 (5)	resources to support students'

	Ta = 44	
Part 2: Action Plan	2. Collaborating around	understanding. Students will be given
Part 3: Take Action	Computing	additional time, as appropriate, and
Part 4: Report & Celebrate	3. Recognizing and Defining	translation tools will be utilized as needed.
	Computational Problems	Students at risk of school failure:
Content-specific modifications	7. Communicating about	Formative and summative data will be use
and accommodations	Computing	to monitor student success, and students at
- use multiple representations		risk of failure will receive additional
and technology to support	NJSLS for ELA Companion	supports and services, which may include
conceptual understanding	Standards	parent consultation, extra help, and
- provide students with skeletons		differentiation strategies, including small
of code and/or utilize flexible	RST.9-10.3	group instruction, group work, scaffolding
·	RST.9-10.4	and spiraling.
grouping	RST.9-10.7	Gifted and Talented Students: Students
	RST.11-12.3	who excel in their mastery of course
Interdisciplinary/additional	RST.11-12.4	standards will be further challenged with
connections		more complex tasks, extensions of concept
- Engage in programming	NJSLS-CLKS	and skills, and extended problem solving
assignments that have	- 21st Century Life and Careers	and critical thinking opportunities.
applications in science,	9.4.12.CI.1	
mathematics, or business	9.4.12.CI.3	
- Consider potential	9.4.12.CT.1	
programming applications for	9.4.12.CT.2	
climate change	,	
- Draw on contexts from diverse	- Technology	
groups for programming	9.4.12.IML.3	
	J	
exercises	- Career Education	
	9.2.12.CAP.2	
	9.3.ST.5	
	9.3.ST-ET.5	
	9.3.ST-E1.3 9.3.ST-SM.2	
	7.J.S1-SWI.Z	

Course: AP Computer Science A PVRHSD CURRICULUM MAP Grade Level: 10 – 12

Examples of Teaching Strategies

Final Project and Student Presentations

Students are required to do a 20-30 minute presentation in June on their final project. There are three parts to the final project. Students are required to research a topic not taught in the AP A curriculum, such as advanced data structures. They are to produce a paper on that topic. Then teach the class the topic using power-point presentations and examples. A large-scale group programming project is the third component. The presentation will also detail the design and implementation of the large-scale program that students have proposed, planned, designed, and written. After each presentation, time is allotted for questions from me and other students in the class.

Lab Component

I give at least one program per chapter, and students work on their programs about 60 percent of the time. Each student has a laptop with the necessary software installed.

Students can work on programs at home and in class. They work independently and with a partner when appropriate.