COURSE: AP Computer Science A	GRADE(S): 11 12
UNIT 1 : Algorithm Development	

NATIONAL STANDARDS:
ALL STUDENTS…

- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- Apply digital tools to gather, evaluate, and use information.
- Use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
- Understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- Demonstrate interpersonal, teamwork, problem solving, and leadership skills
- Develop career awareness, make career choices, and become employable in a variety of careers
- Prepare for further education and lifelong learning

STATE STANDARDS:	UNIT OBJECTIVES:
2.5.11A. Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems. **2.5.11B.** Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results. **2.5.11C.** Present mathematical procedures and results clearly, systematically, succinctly and correctly. **2.5.11D.** Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.	**1.1 Develop Algorithms to solve real world problems** **1.2 Write methods for individual blocks of code**
ACTIVITIES: **1.1-1.2** **Write mathematical methods…** **LCM, GCD,Is Prime Number, Is Perfect Number, etc…** **RESOURCES:** **www.apcentral.collegeboard.com** **Computer Science AB: Quick Reference Guide**	**ASSESSMENTS :** **Algorithm development quiz** **AP Essay and Multiple Choice problems from past AP Exams** **REMEDIATION:** **Consecutive sums method** **ENRICHMENT:** **Prime factorization**

COURSE: AP Computer Science A	GRADE(S): 11 12
UNIT 2 : Strings	

NATIONAL STANDARDS:
ALL STUDENTS…

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- Understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- Demonstrate interpersonal, teamwork, problem solving, and leadership skills
- Develop career awareness, make career choices, and become employable in a variety of careers
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STATE STANDARDS:	UNIT OBJECTIVES:
2.5.11A. Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems. **2.5.11B.** Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results. **2.5.11C.** Present mathematical procedures and results clearly, systematically, succinctly and correctly. **2.5.11D.** Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.	**2.1 Manipulate Strings using String Methods** **2.2 Solving real world problems using Strings**
ACTIVITIES: **2.1-2.2** **Pig Latin conversion program** **Password Strength method program** **Mono-Random Alphabet Cypher** **RESOURCES:** **www.apcentral.collegeboard.com** **Computer Science AB: Quick Reference Guide**	**ASSESSMENTS :** **I before e method quiz** **AP Essay and Multiple Choice problems from past AP Exams** **REMEDIATION:** **VIN Program (Deciphering car VIN Number)** **ENRICHMENT:** **ISBN program (Validity check of ISBN and Country of Origin)**

COURSE: AP Computer Science A	GRADE(S): 11 12
UNIT 2 : Strings	

NATIONAL STANDARDS:
ALL STUDENTS…

- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
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STATE STANDARDS:	UNIT OBJECTIVES:
2.5.11A. Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems. **2.5.11B.** Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results. **2.5.11C.** Present mathematical procedures and results clearly, systematically, succinctly and correctly. **2.5.11D.** Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.	**2.3 Manipulate Strings using String Methods** **2.4 Solving real world problems using Strings**
ACTIVITIES: **2.1-2.2** **Pig Latin conversion program** **Password Strength method program** **Mono-Random Alphabet Cypher** **RESOURCES:** **www.apcentral.collegeboard.com** **Computer Science AB: Quick Reference Guide**	**ASSESSMENTS :** **I before e method quiz** **AP Essay and Multiple Choice problems from past AP Exams** **REMEDIATION:** **VIN Program (Deciphering car VIN Number)** **ENRICHMENT:** **ISBN program (Validity check of ISBN and Country of Origin)**

COURSE: AP Computer Science A	GRADE(S): 11 12
UNIT 3 : ArrayList and Arrays	

NATIONAL STANDARDS:
ALL STUDENTS…

- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- Apply digital tools to gather, evaluate, and use information.
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- Understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- Demonstrate interpersonal, teamwork, problem solving, and leadership skills
- Develop career awareness, make career choices, and become employable in a variety of careers
- Prepare for further education and lifelong learning

STATE STANDARDS:	UNIT OBJECTIVES:
2.5.11A. Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems. **2.5.11B.** Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results. **2.5.11C.** Present mathematical procedures and results clearly, systematically, succinctly and correctly. **2.5.11D.** Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.	**3.1 Implement two dimensional arrays of simple data types to store data** **3.2 Implement two dimensional arrays of Objects to store data** **3.3 Use ArrayList Objects to implement single and two dimensional arrays**
ACTIVITIES: **3.1 – 3.3** **Write methods to implement standard algorithms: Linear search, binary search, bubble sort, Insertion sort** **The Game of Life Program** **Released AP Multiple Choice Problems** **Released AP Essay Problems** **RESOURCES:** **www.apcentral.collegeboard.com** **Computer Science AB: Quick Reference Guide**	**ASSESSMENTS :** **Star Map Program** **Banking Simulation Program** **AP Essay and Multiple Choice problems from past AP Exams** **REMEDIATION:** **Saddle Point Program** **ENRICHMENT:** **Released AP Essay Problems**

COURSE: AP Computer Science A	GRADE(S): 11 12
UNIT 4 : Recursion	

NATIONAL STANDARDS:
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- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
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- Understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- Demonstrate interpersonal, teamwork, problem solving, and leadership skills
- Develop career awareness, make career choices, and become employable in a variety of careers
- Prepare for further education and lifelong learning

STATE STANDARDS:	UNIT OBJECTIVES:
2.5.11A. Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems. **2.5.11B.** Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results. **2.5.11C.** Present mathematical procedures and results clearly, systematically, succinctly and correctly. **2.5.11D.** Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.	**4.1 Write recursive methods** **4.2 Compare and Contrast iterative versus recursive methods**
ACTIVITIES: **4.1 – 4.2** **Recursive functions handouts** **Write recursive methods:** **Power, factorial, summary, reverseString, Fibonacci, isPalindrome, BinarySearch, displayDigits** **Released AP Multiple Choice Problems** **Released AP Essay Problems** **RESOURCES:** **www.apcentral.collegeboard.com** **Computer Science AB: Quick Reference Guide**	**ASSESSMENTS :** **Recursion Test (Fibonacci Method)** **AP Essay and Multiple Choice problems from past AP Exams** **REMEDIATION:** **Write GetLarge method** **Write NumDigits Method** **ENRICHMENT:** **Released AP Essay Problem**

COURSE: AP Computer Science A	GRADE(S): 11 12
UNIT 5 : AP Case Study	

NATIONAL STANDARDS:
ALL STUDENTS…

- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- Apply digital tools to gather, evaluate, and use information.
- Use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
- Understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- Demonstrate interpersonal, teamwork, problem solving, and leadership skills
- Develop career awareness, make career choices, and become employable in a variety of careers
- Prepare for further education and lifelong learning

STATE STANDARDS:	UNIT OBJECTIVES:
2.5.11A. Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems. **2.5.11B.** Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results. **2.5.11C.** Present mathematical procedures and results clearly, systematically, succinctly and correctly. **2.5.11D.** Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.	**5.1 Explore and understand AP Case Study** **5.2 Write code to implement extra features in the case study**
ACTIVITIES: **5.1-5.2** **Complete AP Case Study student manual** **Write classes that implement new AP Case study features** **RESOURCES:** **www.apcentral.collegeboard.com** **Computer Science AB: Quick Reference Guide**	**ASSESSMENTS :** **AP Essay and Multiple Choice problems from past AP Exams** **REMEDIATION:** **Review of AP Case Study Essay Problems** **ENRICHMENT:** **Released AP Essay Problems**

COURSE: AP Computer ScienceA	GRADE(S): 11 12
UNIT 6 : Post AP Test	

NATIONAL STANDARDS:
ALL STUDENTS…

- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
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- Use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
- Understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- Demonstrate interpersonal, teamwork, problem solving, and leadership skills
- Develop career awareness, make career choices, and become employable in a variety of careers
- Prepare for further education and lifelong learning
- Demonstrate interpersonal, teamwork, problem solving, and leadership skills
- Develop career awareness, make career choices, and become employable in a variety of careers
- Prepare for further education and lifelong learning

STATE STANDARDS:	UNIT OBJECTIVES:
2.5.11A. Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems. **2.5.11B.** Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results. **2.5.11C.** Present mathematical procedures and results clearly, systematically, succinctly and correctly. **2.5.11D.** Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.	**6.1 Design a robust computer program** **6.2 Demonstrate knowledge of computer science principles**
ACTIVITIES: **6.1 – 6.2** **Final Project** **Teacher Programs** **RESOURCES:** **www.apcentral.collegeboard.com** **Computer Science AB: Quick Reference Guide**	**ASSESSMENTS :** **Final Project of students own choosing demonstrating knowledge of the Advanced Java Coding Techniques.** **Teacher Programs** **REMEDIATION:** **Final Project** **Teacher Programs** **ENRICHMENT:** **Final Project**